

SEVEN

PUBLICAÇÕES ACADÊMICAS

PRINCIPLES AND CONCEPTS
FOR DEVELOPMENT
IN NOWADAYS SOCIETY

Mauro Pinho
Marco Antonio Schueda
Danielle do Rocio Brostulin
(Book organizers)

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CHAPTER 1

Underwater pulsed ultrasound in animal model osteochondral injury

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ABSTRACT

Objective: To study changes in an osteochondral surface, submitted to a standardized mechanical lesion analyzing the use of pulsed ultrasound with a frequency of 1MHz, at 20%, with frequency modulation of 16Hz, 0.5 W/cm² of intensity, and application time of 5 minutes in these lesions. Method: Sixteen white, male, New Zealand rabbits (*Oryctolagus cuniculus*) less than six months old, with weight ranging from 1,540 grams (g) to 2,450

with standardized lesions in femoral condyles were used. They were submitted to daily application of pulsed ultrasound at a frequency of 1MHz, at 20%, with frequency modulation of 16Hz, 0.5 W/cm² intensity and application time of 5 minutes in two groups with two and four weeks of osteochondral lesion. Result: The animal model selected and the formatting of the histological analysis were adequate for the proposed research. The use of pulsed ultrasound with frequency of 1MHz, at 20%, with frequency modulation of 16Hz, 0.5 W/cm² of intensity and application time of 5 minutes in acute osteochondral lesions showed similar statistical significance in chondral regeneration compared to the Control Group. In the application of USPSA (UNDERWATER PULSED ULTRASOUND) in the proliferative phase (third and fourth week) of acute osteochondral lesions there was a decrease in osteoblastic proliferation and formation of immature bone. Conclusions: There was an improvement in osteochondral regeneration with the use of the method, but ultrasonic emission parameters applied in the treatment of acute osteochondral lesions must continue to be studied, as these presented here constitute only one of the numerous therapeutic possibilities of this modality.

Keywords: osteochondral lesion, underwater pulsed ultrasound.

1 INTRODUCTION

Methods of restoration and replacement of joint defects represent a major contribution of medicine to the 20th century¹, and it is stated that surface restoration is fundamental to the use of the joint in a physiologically appropriate manner².

The greatest difficulty is not to diagnose the cartilaginous lesion, because both clinically and through complementary examinations the destruction of the articular cover can be identified and classified. It is the cure or the best management of the lesion that brings apprehension to the therapist.

In today's society it is estimated that 60% of people over the age of 35 report symptoms of joint pain, and the deterioration of joint structure not only decreases quality of life but also has a significant economic impact, especially as the population of a country ages³.

There is a strong association between joint degeneration and age. In some populations, 60% to 90% of people over the age of 65 have been shown to have osteoarthritis, compared to less than 5% of people between the ages of 15 to 44 years and 25% to 30% of people between the ages of 45 to 64 years. Authors have calculated that 95,000 total knee arthroplasties and 41,000 other procedures to repair cartilage defects are performed each year in the United States of America (USA) .⁴

In Brazil, the prevalence of osteoarthrosis is 16.19%, responsible for 30 to 40% of consultations in rheumatology outpatient clinics, according to data from the INPS/INAMPS, and is also the cause of 7.5% of all work absences. It is the second disease among those that justify initial assistance with 7.5% of the total, second also in sickness assistance (in extension) with 10.5% and fourth in determining retirement with 6.2%⁵ .

Although the cause of osteoarthritis is often unknown and there is no cure for it, early diagnosis and treatment can help minimize symptoms and help patients maintain an active life.

Despite the frequency and impact caused by degenerative joint disease, it is being considered as an inevitable consequence of aging. Research is always looking for ways to slow the progression of osteoarthritis in more diverse ways .⁶

Several experimental studies have been conducted in order to clarify the different aspects related to joint biological responses^{7,8} .

Recently, the use of ultrasound applications has been reported as a resource capable of promoting the restoration of cartilaginous articular surfaces⁹ , but the literature has not yet presented elements capable of supporting such statements on an objective and consistent basis.

2 OBJECTIVE

The present work aims to evaluate whether the application of underwater ultrasound has a positive effect on the restoration of injured articular cartilaginous surfaces.

PATHOPHYSIOLOGY OF JOINT INJURIES

Changes in Cartilage

Physiologically the self-repair of articular cartilage comes from the intermediate zone being an interactive process that adds the biomechanical adhesive property to a subordinate molecular cellular healing process¹¹ .

During chronic degeneration, the scarring process produces, for superficial deposition, type I collagen associated with fibronectin and tenascin forming fibrocartilage, a structure that is stiffer than the original cartilage¹² . The closest visible signs of osteoarthritis are localized fibrillation or disruption of the most superficial layers of articular cartilage (Blade 5).

As the disease progresses, more parts of the joint surface become wrinkled and uneven, and the fibrillation extends deeper into the cartilage until it reaches the subchondral bone.

When the cracks in the cartilage grow, the superficial edges of the fibrillated cartilage wear away, releasing fragments and decreasing the thickness of the cartilage. At the same time, enzymatic degeneration of the matrix can further decrease the volume of the cartilage. Eventually, the progressive loss of articular cartilage leaves the bone exposed (Blade 5).

Many of the mechanisms responsible for the progressive loss of cartilage remain unknown, but the process can be divided into three overlapping phases: that of cartilage damage, that of chondrocyte response, and that of the decline in chondrocyte response.

In the first phase, the macromolecular frame matrix breaks down and the aqueous content increases. The concentration of type II collagen remains constant, but decreases in aggregation and proteoglycan concentration generally accompany the increase in aqueous content. These changes increase the permeability and decrease the stiffness of the matrix, changes that may increase its vulnerability to further damage. Chondrocytes detect tissue damage, possibly as a result of changes in osmolarity, charge density, or pressure applied across the cell membrane, tethered to the matrix molecules.

Once the chondrocytes detect tissue damage, they release mediators that stimulate the tissue response. Nitric oxide likely plays a role in this response, since chondrocytes produce this molecule in response to a variety of mechanical and chemical stresses. Nitric oxide diffuses rapidly and can induce the production of IL-1, which stimulates the expression of metalloproteases that degrade matrix macromolecules. Fibronectin fragments of IL-1 or other molecules from damaged tissue can promote IL-1 production. Degradation of type IX and XI collagens and other molecules can destabilize the fibrillar cross-linkage and type II collagen, allowing aggregate expansion and increasing water content. A decline in aggregation, and in particular an associated loss of aggrecan, could increase pressures on the remaining collagen fibril network and chondrocytes, with joint overload. Enzymatic degeneration also eliminates damaged matrix components and may release anabolic cytokines, previously encased in the matrix, that stimulate synthesis of matrix macromolecules and chondrocyte proliferation. Shells or clones of the cells, which proliferate surrounded by the newly synthesized matrix molecules, constitute one of the signs of the chondrocyte reparative response to cartilage degeneration. This response counters the catabolic effects of proteases and can stabilize or, in some circumstances, even restore the tissue.

The failure to stabilize or restore the tissue leads us to the third phase of degeneration, namely the decline in chondrocyte response, which may be irreversible. This decline may result from mechanical damage or death of chondrocytes long unprotected and stabilized by the functional matrix, but this also appears to be related to or initiated by down-regulation of the chondrocyte response to anabolic cytokines. It may occur as a result of synthesis or accumulation of molecules in the matrix that bind to the anabolic cytokines.

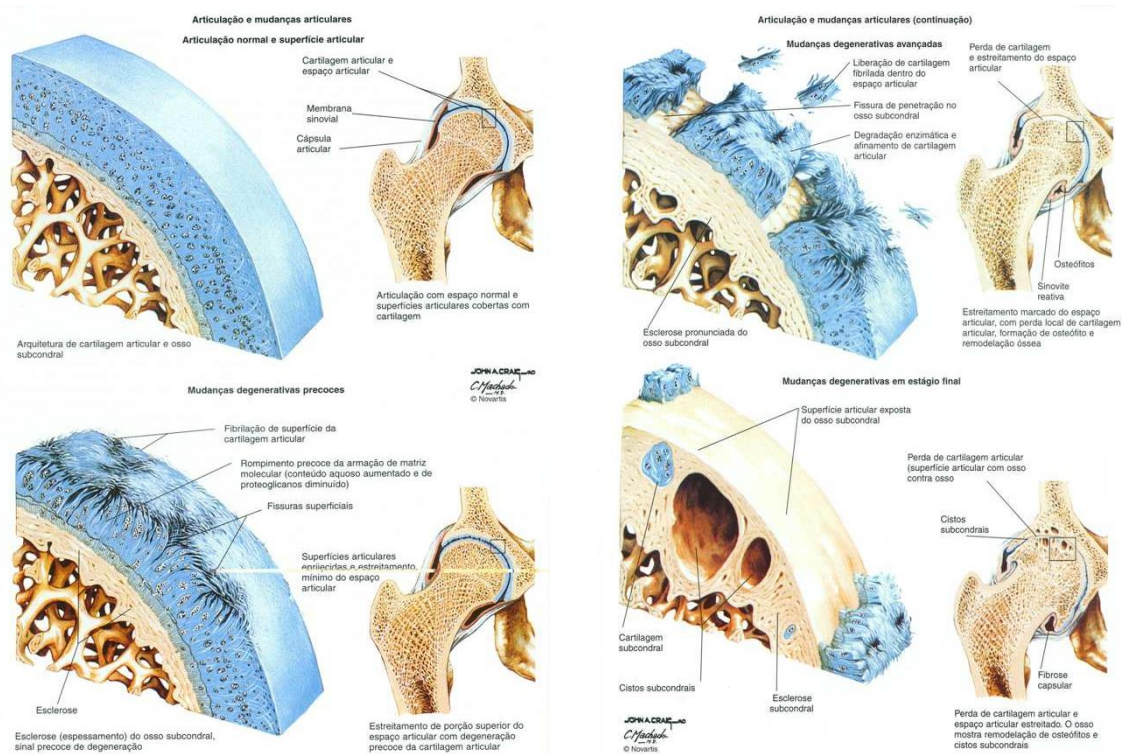
The injury and reparative response is distributed into three classes¹³ :

- 1- Cartilage damage, but with intact surface (internal chondral damage and possible subchondral damage)
- 2- Mechanical tearing of the articular surface limited to the thickness of the cartilage
- 3- Mechanical tearing of articular cartilage and subchondral bone

An epidemiological study, describes that subchondral sclerosis determines changes in bone replacement further accelerating the osteoarthritis process¹⁴.

The described evidences lead us to believe that any experiments that are performed, aiming to restore articular surfaces, must have them previously injured, under penalty of not having a local situation similar to the one that would be presented by an injured joint.

Figure 1 - Articulation and Articular Changes



PHYSICAL PRINCIPLES OF ULTRASOUND

WAVES

Ultrasound is a form of mechanical energy that consists of high-frequency vibrations. Ultrasonic waves are longitudinal and cause oscillations in the particles of the medium in which they propagate. The frequencies of ultrasonic waves range from 20,000 to 20,000,000 cycles per second (1 cycle/second = 1 Hertz) and are inaudible to human hearing, whose sensitivity ranges from 20 to 18,000 Hz.

The medical frequency for diagnostic imaging ranges from 5,000,000 to 20,000,000 Hz, i.e. 5 to 20 megahertz (MHz), and the therapeutic from 0.7 to 3 MHz.

WAVE PRODUCTION

Ultrasound was originally produced by a quartz crystal vibrating when subjected to a high frequency current discovered by LANGEVIN in 1917. This vibration drives the particles in the medium, producing

waves by compression and decompression called the piezoelectric effect. Any material that transforms one energy into another is called a transducer.

Currently we have synthetic ceramic crystals as transducers, and the metal alloy composed of lead, zirconium, and titanium (ZTC = Zirconate-titanate of lead) is the most commonly used for its durability and efficiency in converting electric current into mechanical vibrations.

EFFECTS OF ULTRASOUND ON INJURY REPAIR

if used correctly and at the appropriate time after injury has occurred, ultrasound can be a very powerful therapeutic modality. "Correctly" means using the lowest intensity possible to obtain the desired result (intensities above 1 W/cm² should not be necessary), and the "appropriate time after injury occurs" means during the inflammatory phase of repair. Clinicians should take advantage of the numerous wound assessment techniques that currently exist in order to test the efficacy of their therapies¹⁵. Finally, ultrasound can be dangerous if employed incorrectly; thus, users should fully understand the mechanisms of how this modality works.

It is proven active in the Inflammatory, Proliferative and Remodeling stages of chondral lesions⁹.

3 MATERIAL AND METHODS

MATERIAL

Sixteen white, male rabbits (*Oryctolagus cuniculus*), less than six months old, of the New Zealand lineage, with weight varying from 1,540 grams (g) to 2,450 g, were used. They came from and were housed at the Coelhário do Colégio Agrícola Federal Senador Gomes de Oliveira (CAFSGO) in Araquari, Santa Catarina, in an agreement with the Universidade da Região de Joinville-UNIVILLE.

The rabbits were kept in metal cages measuring 0.81 meter (m) X 0.60 m X 0.45 m, with a maximum of three per cage, in a protected environment, isolated from noise, fed with food suitable for the species and water at will.

The choice of breed was only made for greater homogeneity of the sample, as well as the choice of males to avoid hormonal variability and, in the case of mixed housing, crossbreeding.

The animals were submitted to veterinary follow-up and operated on in a specially built surgical environment under specific standards of disinfection and asepsis.

We followed the Animal Ethics Protocol governed by Federal Law 6.638/79

The instruments used to make the lesion were designed by Biológica-GMReis Campinas - Brazil and the ultrasound equipment used in the study was the AVATAR V model from KLD Amparo - Brazil. The collected material was sent for histological analysis.

4 METHODS

The procedures were carried out in four distinct steps:

PROCEDURE 1 (ONE) performing the surgeries to produce the osteochondral lesions according to Schueda et al's Animal Model .¹⁶

PROCEDURE 2 (TWO) Application of SUBAQUATIC PULSED ULTRASOUND in the Animal Model in groups A and B.

PROCEDURE 3 (THREE) Collection of material for analysis.

PROCEDURE 4 (FOUR) Histological analysis.

All procedures from preoperative, anesthetic induction, anesthesia, antisepsis, surgery, immediate and late postoperative care as well as euthanasia were performed in the Experimental Surgery Laboratory of CAFSGO. The rabbits were maintained with water and appropriate feed at will until the moment of the operation (Figure 2).

Figure 2 - Photograph of the rabbit room with conditioning of the animals and procedure on knees after anesthesia and placement of fields.



PROCEDURE ONE

After weighing, the animals were submitted to pre-anesthetic medication with acepromazine 1%, intramuscular (IM) in the *régio glutea* (gluteal region), at a dose of 0.2 milligrams (mg) per kilogram (kg) of body weight ($0.2\text{mg}\cdot\text{kg}^{-1}$).

After fifteen minutes they received, as anesthetic medication, xylazine $10\text{mg}\cdot\text{kg}^{-1}$ and ketanine $25\text{mg}\cdot\text{kg}^{-1}$, by the same route and place of the pre-anesthetic medication.

The standard procedure was followed, producing the osteochondral lesions (fig. 3) and then closing the surgical wound by layers.

Figure 3 - Photograph of the production of the lesion in the Medial Femoral Condyle.



PROCEDURE TWO

The 16 operated rabbits were divided into two groups of 8 animals:

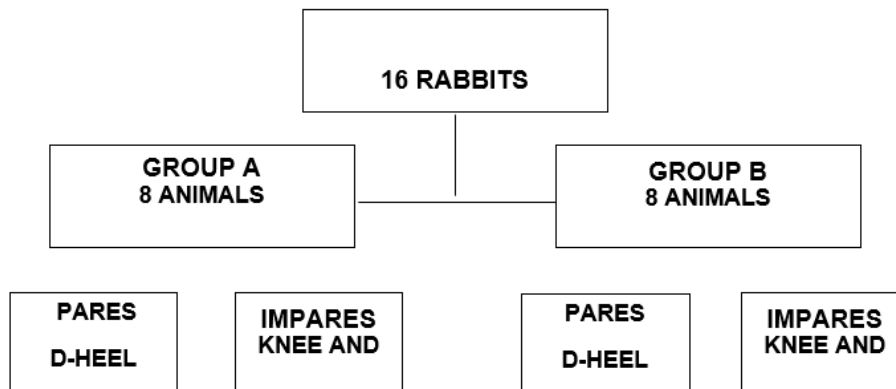
GROUP A - Application of SUBAQUATIC PULSED ULTRASOUND (USPSA) in the first two weeks postoperatively with a daily application.

GROUP B - Application of SUBAQUATIC PULSED ULTRASOUND in the third and fourth postoperative weeks with a daily application.

The groups were subdivided in such a way that the Peer rabbits received USPSA application on the Right knees (D) while the Unpeers received it on the Left knees (E) (Organogram 1).

The untreated knees remained as Control Group

Chart 1 - Distribution of the groups and subgroups for the study.



Based on the previous theoretical foundation, the frequency, intensity, mode, duration, and treatment interval were formatted through calculations of tissue thickness in the rabbit knee region. The parameters used in the equipment were: frequency of 1MHz, 0.5 W/cm² intensity, pulsed mode at 20% with modulation frequency of 16Hz and application time of 5 minutes, totalizing 10 applications.

Indirect contact was chosen as the ultrasound application technique, through the underwater way (Figure 4).

Figure 4 - Photograph of underwater pulsed ultrasound application.



PROCEDURE THREE

After the second week in Group A and after the fourth week in Group B, the animals were euthanized with an intravenous injection of 3 milliliters (ml) of 10% potassium chloride.

The knees were exposed using a number 15 scalpel blade and after total removal of soft tissue, right and left femoral supracondylar osteotomy was performed with an oscillatory saw (Figure 5).

Figure 5 - Photograph of the femoral condyles after completion of the experiment.



They were placed in identified flasks with 10% formaldehyde (Figure 30) and sent to the CEDAP Laboratory (Centro de Diagnóstico Anatómico Patológico) for the preparation of blocks, slides and histological analysis of the samples with sections tangential to the lesions.

PROCEDURE FOUR

Hematoxylin and Eosin (HE) and Masson's stain were used to analyze the samples.

All slides were analyzed by two experienced histologists, who answered the predetermined questionnaire, and these professionals did not know the Group to which the slides belonged.

STATISTICAL EVALUATION

The variables were represented by absolute (n) and relative (%) frequency.

The comparison between the two groups regarding the distributions of the

The proportions of YES or NO answer was done by the Chi-square test. The

Differences were located by the Chi-square Partition test.

The two groups were compared to the distribution of scores using the Student's T method. A significance level of 0.05 ($\alpha = 5\%$) was adopted, and descriptive levels (p) below this value were considered significant and represented by *.

5 RESULTS

HISTOLOGICAL ANALYSIS

GROUP A - treated in the first two weeks

Control Group

Histological analyses of the injured condyles in Group A (Fig. 6) revealed the presence of different amounts of hyaline cartilage and fibrocartilage irregularly distributed throughout the lesion area. They also reveal immature bone, osteoblastic proliferation and other regenerative changes described above. There is an invasion of healthy tissues around the injured area, but no complete regeneration of the osteochondral architecture neighboring the lesion.

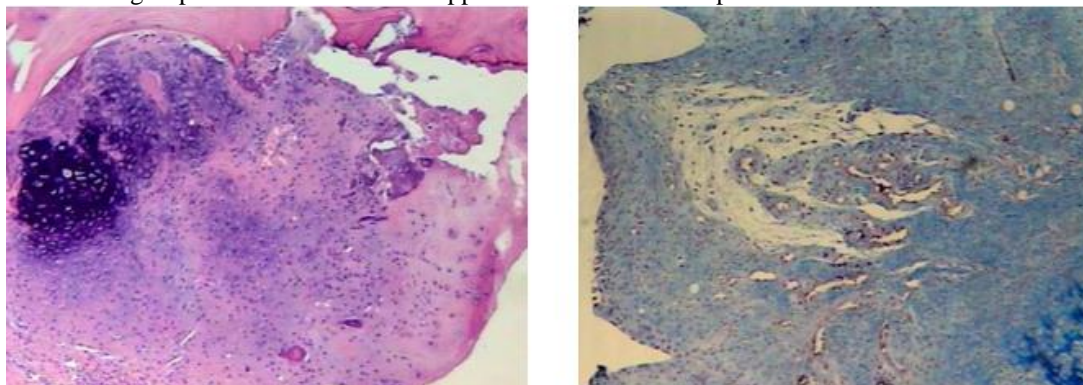
The different tissue regenerations organized in Table I were measured in a semi-quantitative way.

Masson's staining differentiated proportionally the amount of hyaline and/or fibrous cartilage present.

The intensity of immature bone tissue formation and osteoblastic proliferation, cartilaginous tissue as well as subchondral vessel formation and remodeling were quantified.

The scar response of structuring a chondrogenic layer, cartilaginous matrix and chondrocyte nests were grouped together and assessed as to whether or not they appeared in a summation of signs.

Figure 6 - Photomicrographs at 40x magnification of H&E stained MASSON stained knee cartilage sample from animal belonging to the control group of two weeks without application of underwater pulsed ultrasound



With application of pulsed underwater ultrasound

Microscopic examination of the samples taken from Group A revealed the presence of different amounts of hyaline cartilage and fibrocartilage irregularly distributed throughout the lesion area. Similarly, there is an invasion of healthy tissue around the lesion area. By applying Masson's staining, the amount of existing hyaline and/or fibrous cartilage and the other histological alterations present were differentiated proportionally (Fig. 7).

Figure 7 - Photomicrography at 40x magnification of a knee cartilage sample stained by H&E and by MASSON from an animal belonging to group a with two weeks of underwater pulsed ultrasound application

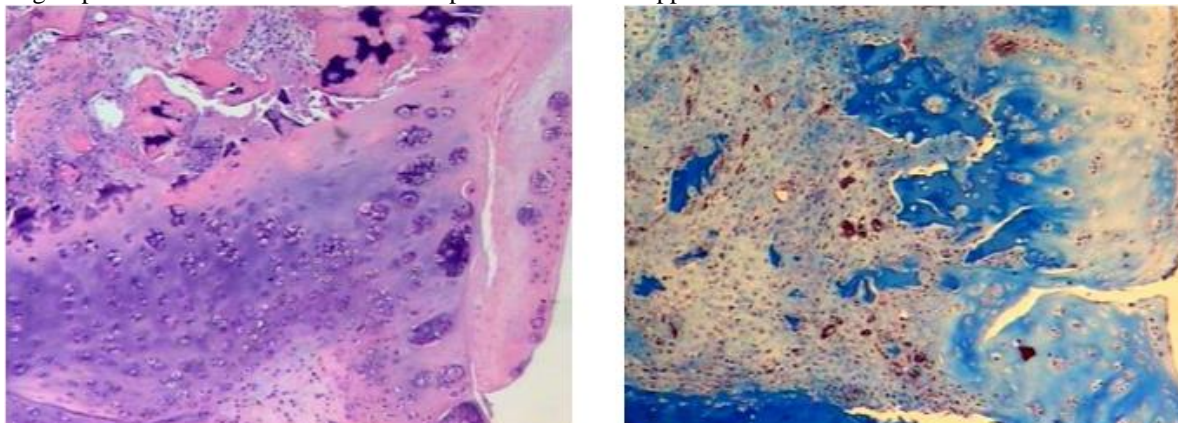


Table I was associated with the evaluation of the group of knees submitted to the application of ultrasonic treatment.

Table 1 - Distribution of histological alterations found in group A

0-2 WEEKS W/US	01	02	03	04	05	06	07	08	AVERAGE
FIBER REACTION	1	1	4	1	4	2	2	1	2
HYALINE REACTION	4	4	1	4	1	3	3	4	3
IMMATURE BONE	3	2	4	2	3	4	4	4	3,25
PROLIF. OSTEOB.	4	2	4	4	4	4	4	3	3,625
C.C.+ M.C.+ N.C.	4	4	1	4	4	4	4	3	3,5
VESSELS	3	2	2	2	2	3	2	2	2,25
REMODELING	1	1	2	2	4	2	3	4	2,125
0-2 WEEKS WITHOUT	01	02	03	04	05	06	07	08	AVERAGE
FIBER REACTION	3	1	1	3	4	1	4	3	2,5
HYALINE REACTION	2	4	4	2	1	4	1	2	2,5
IMMATURE BONE	2	2	4	2	4	2	2	2	2,5
PROLIF. OSTEOB.	2	3	4	3	4	3	3	3	3,125
C.C.+ M.C.+ N.C.	4	2	4	4	4	4	2	4	3,25
VESSELS	3	3	2	4	2	2	3	3	2,75
REMODELING	3	1	2	4	1	3	3	4	2,625

Comparison between Groups with and without USPS application on treated lesions in the first two weeks

Group A with and without application were compared (fig. 8), considering the presence of fibrocartilage, hyaline cartilage, and other scar parameters.

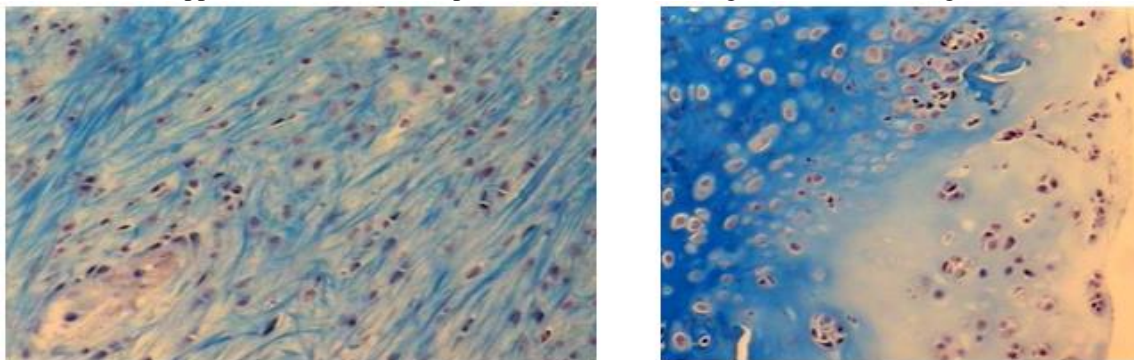
Group B - Treated at the third and fourth week post injury

Without applying underwater pulsed ultrasound

The microscopic examination of the samples taken from Group B revealed the presence of different amounts of fibrocartilage, hyaline cartilage (Fig. 8) distributed irregularly throughout the lesion. There was invasion of healthy tissue around the injured area, but no complete regeneration of the osteochondral architecture surrounding the lesion.

By applying H&E and Masson's staining, the amount of hyaline and/or fibrous cartilage formed was differentiated proportionally.

Figure 8 - Photomicrography at 100x magnification of a Masson-stained knee cartilage sample from an animal belonging to group B without and with application of underwater pulsed ultrasound showing area of fibrocartilage



The intensity of immature bone tissue production, osteoblastic proliferation, cartilaginous tissue, as well as subchondral vessel formation and remodeling, were quantified as shown in the table above.

The scar response of chondrogenic layer structuring, cartilaginous matrix and chondrocyte nests were grouped and assessed as to whether or not they appeared in a summation of signs.

By collecting data from the group, we formatted Table 2, which evaluates the responses from the site subjected to the injury.

Table 2 - Distribution of histological alterations found in group B

3-4 WEEKS WITH US	1	2	3	4	5	6	7	8	AVERAGE
FIBER REACTION	3	4	1	4	4	3	1	4	3
HYALINE REACTION	2	1	4	1	1	3	4	1	2.125
IMMATURE BONE	2	3	2	2	2	2	3	2	2.25
PROLIF. OSTEOB.	3	3	2	2	2	2	3	2	2.375
C.C.+ M.C.+ N.C.	3	1	4	1	1	4	4	3	2.75
VESSELS	3	4	3	2	3	3	3	4	3.125
REMODELING	2	4	1	3	2	2	3	1	2.25
3-4 WEEKS WITHOUT US	1	2	3	4	5	6	7	8	AVERAGE
FIBER REACTION	4	4	4	3	1	1	3	4	3
HYALINE REACTION	1	1	1	2	4	4	2	1	2.375
IMMATURE BONE	4	3	4	3	3	2	3	2	3
PROLIF. OSTEOB.	4	3	4	3	3	3	3	3	3.25
C.C.+ M.C.+ N.C.	4	1	1	2	4	4	4	2	2.75
VESSELS	3	4	4	2	2	4	3	3	3.125
REMODELING	2	4	2	4	2	3	2	2	2.625

With application of pulsed underwater ultrasound

Microscopic examinations of the fragments taken from the group reveal the presence of different amounts of hyaline cartilage and fibrocartilage irregularly distributed throughout the lesion area. Similarly, there is an invasion of healthy tissue around the injured area. Masson's staining was applied to differentiate proportionally the amount of existing hyaline and/or fibrous cartilage and the other histological alterations present.

Table 2 shows the evaluation of the group of knees submitted to ultrasonic treatment.

STATISTICAL ANALYSIS OF GROUP A - TREATED IN THE FIRST TWO WEEKS

	<i>FIBROUS REACTION W/ US</i>	<i>FIBROUS REACTION W/O US</i>
AVERAGE	1,75	2,5
VARIANCE	1,071428571	1,714285714
REMARKS	8	8
STANDARD DEVIATION	1,0034556	1,027316256
	<i>HYALINE REACTION W/ US</i>	<i>HYALINE REACTION W/O US</i>
AVERAGE	3,25	2,5
VARIANCE	1,071428571	1,714285714
REMARKS	8	8
STANDARD DEVIATION	1,0034556	1,027316256
	<i>IMMATURE BONE W/ US</i>	<i>W/O US IMMATURE BONE</i>
AVERAGE	3,25	2,5
VARIANCE	0,785714286	0,857142857
REMARKS	8	8
STANDARD DEVIATION	0,988014305	0,992322093
	<i>PROLIF. OSTEOB W/ US</i>	<i>PROLIF. OSTEOB W/O US</i>
AVERAGE	3,625	3,125
VARIANCE	0,553571429	0,410714286
REMARKS	8	8
STANDARD DEVIATION	0,970864639	0,956482416
	<i>C.C.+M.C.+N.C. W/ US</i>	<i>C.C.+M.C.+N.C. W/O US</i>
AVERAGE	3,5	3,5

VARIANCE	1,142857143	0,857142857
REMARKS	8	8
STANDARD DEVIATION	1,006698908	0,992322093
<i>VESSELS W/ US</i>		<i>W/O US VESSELS</i>
AVERAGE	2,25	2,75
VARIANCE	0,214285714	0,5
REMARKS	8	8
STANDARD DEVIATION	0,925869251	0,965936329
<i>REMODELING W/ US</i>		<i>W/O US REMODELING</i>
AVERAGE	2,375	2,625
VARIANCE	1,410714286	1,410714286
REMARKS	8	8
STANDARD DEVIATION	1,017353663	1,017353663

IN NONE OF THE ABOVE TESTS WERE THERE SIGNIFICANT DIFFERENCES BETWEEN THE MEANS $P>0.05$. STATISTICAL TEST USED: student's t .

GROUP B - TREATED IN THE THIRD AND 4TH WEEKS

<i>FIBROUS REACTION W/ US</i>		<i>FIBROUS REACTION W/O US</i>
AVERAGE	3	2,875
VARIANCE	1,714285714	1,553571429
REMARKS	8	8
STANDARD DEVIATION	1,027316256	1,022272225
<i>HYALINE REACTION W/ US</i>		<i>HYALINE REACTION W/O US</i>
AVERAGE	2	2,125
VARIANCE	1,714285714	1,553571429
REMARKS	8	8
STANDARD DEVIATION	1,027316256	1,022272225

THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN MEANS $P>0.05$. STATISTICAL TEST USED: student's t in the above tests

<i>IMMATURE BONE W/ US</i>		<i>IMMATURE BONE W/O US</i>
AVERAGE	2,25	3
VARIANCE	0,214285714	0,571428571
REMARKS	8	8
STANDARD DEVIATION	0,925869251	0,972407047

THERE WAS SIGNIFICANT DIFFERENCE BETWEEN THE MEANS $P>0.05$. STATISTICAL TEST USED: student's t .

<i>PROLIF. OSTEOB W/ US</i>		<i>PROLIF. OSTEOB W/O US</i>
AVERAGE	2,375	3,25
VARIANCE	0,267857143	0,214285714
REMARKS	8	8
STANDARD DEVIATION	0,936257181	0,925869251

THERE WAS SIGNIFICANT DIFFERENCE between means $p>0.05$. Statistical test used: t-student.

<i>C.C+M.C.+N.C. W/ US</i>		<i>C.C+M.C.+N.C. W/O US</i>
AVERAGE	2,625	2,75
VARIANCE	1,982142857	1,928571429
REMARKS	8	8
STANDARD DEVIATION	1,03480078	1,033384127

NO SIGNIFICANT DIFFERENCE BETWEEN MEANS $P>0.05$. STATISTICAL TEST USED: student's t .

	<i>VESSELS W/ US</i>	<i>VESSELS W/O US</i>
AVERAGE	3,125	3,125
VARIANCE	0,410714286	0,696428571
REMARKS	8	8
STANDARD DEVIATION	0,956482416	0,982073131

THERE WAS NO SIGNIFICANT DIFFERENCE BETWEEN THE MEANS $P>0.05$. STATISTICAL TEST USED: student's *t*.

	<i>REMODELING W/ US</i>	<i>REMODELING W/O US</i>
AVERAGE	2,25	2,625
VARIANCE	1,071428571	0,839285714
REMARKS	8	8
STANDARD DEVIATION	1,0034556	0,991278054

THERE WAS NO SIGNIFICANT DIFFERENCE BETWEEN THE MEANS $P>0.05$. STATISTICAL TEST USED: student's *t*.

6 DISCUSSION

Despite humanity's great technical and scientific advances until the beginning of the 21st century, an ideal and definitive treatment for cartilage injuries has not yet been found. For more than three centuries, authors, such as Hunter since 1743, have cited the difficulties in the healing of articular cartilage. In all eras there has been, and still is, interest in the study of cartilage regeneration, a tissue of vital importance, because when injured, the main symptom is pain, and the limitation may lead to functional loss, leading many individuals to abandon their work or sports activities, regardless of age. experimental studies, with several species of animals, show the regeneration of hyaline cartilage after injuries, depending on the injured site and the size of the injury^{18,19,20}.

In the Control Group analyzed by us, there was no healing of the injured areas; we only found a small percentage of hyaline cartilage in the peripheral region of the lesion. Whenever the subject of cartilage injury was approached, we thought of a probable hypothesis about the existence of some compensation mechanism of load transfer to the non-injured compartment, in an attempt to "save" the injured side. once the cartilage is injured, there is no load transfer; therefore, it is necessary to search for an effective treatment of this area²¹. In our study, since we only injured one condyle, we did not expect this transfer to compromise the uninjured cartilage.

Experimental studies are fundamental for us to understand all the stages of repair or regeneration, and rabbits are the animals of choice for several authors due to their ease of handling and low aggressiveness, being, for these reasons, an animal that offers no risks, besides being extremely easy to be anesthetized¹⁹.

The choice of a single breed was made for greater homogeneity in the sample, as well as the choice of males avoided hormonal variability and crossbreeding in the case of mixed housing.

The care is more related to the drugs used. Ketamine was used as an anesthetic, agreeing with several authors^{22,23,24,25} for the safety of the drug in maintaining the anesthetic plan that was good for the duration of the experiments. Acetpromazine 1%, a phenothiazine tranquilizer, a potent neuroleptic, was used in all animals with expected results obtained²⁶. We used the association of ketamine and xylazine, such

association provides a safe anesthesia in the animals as soon as it is administered, ending its effect in time for the performance of the procedures²⁷. It enabled a good surgical time for a low level of discomfort to the animal.²²

All animals survived the anesthesia and surgery procedures.

In an animal model, to produce a lesion that does not regenerate spontaneously, besides compromising the basal layer, it must reach the subchondral region. Its diameter must exceed 3 mm to 4 mm^{20,28,29,30}. Our Model adopted this care¹⁶. The rabbits operated on were less than 6 months old because the durability of the reparative scar in these animals decreases with their maturation.³¹

We preferred that our rabbits remained without immobilization to effect the regenerative potential of active joint mobility, as well as operated both knees could not restrict the use of the injured³².

The histological exams proved that the lesion had a recent regenerative character, showing moderate structural disorganization. The chondrocytes were arranged in sparse groups, irregularly distributed in the middle of the hyaline matrix, in agreement with observations by authors¹⁹.

It provided a regenerative lesion, according to the animal model chosen, leaving a joint with an osteochondral lesion prepared for the desired therapeutic test, with good articular exposure, after laterally dislocating the patella, as shown in other studies^{25,33,34}.

We used a semi-quantitative and gradual histological scale of cartilage repair, by means of sagittal histological sections, thus being able to graduate the filling of the lesions³⁵. We modified in our histological analysis the regeneration qualification because we needed more accuracy in measuring the osteochondral response to lesions being or not stimulated through the application of electrotherapy, as we would analyze different regenerative reactions.

Based on theoretical basis, the ultrasound equipment model AVATAR V of the company KLD Biosistemas was used, as it is micro processed, meets the international and national safety standards, INMETRO and ISO 9001 certification. It offers a variety of frequencies (1 and 3 MHz) and a head with 1, 3 and 5 cm of ERA (effective radiation area), meeting the requirements of this study. The underwater application technique is considered the best for presenting similar acoustic impedance to the soft tissue, reducing reflection.

Due to the depth of the lesion we opted for a frequency of 1MHz. The intensity used was 0.5 W/cm², for the treatment of acute lesions using low intensities, since the high ones could be harmful to the tissues. The pulsed mode was chosen for also being indicated in the treatment of acute lesions, for presenting minimized thermal effects, and the work cycle in 20% with frequency modulation of 16Hz contemplated the use in both groups.

The application time of 5 minutes has been standardized so that the treatment time is at least 1 minute for an area of 1 cm². Areas no larger than the size of the head should be treated for a few minutes (3 to 5) using the semi-static method. The frequency of daily treatment was chosen, because in acute cases

they must be treated daily. The period of ten days is due to the fact that this is the minimum number of sessions performed in physical therapy services.

Pulsed ultrasound has a significant therapeutic effect in stimulating tissue regeneration and bone tissue repair.

In our study that analyzed chondral behavior with USPSA using 0.5 W/cm² / 1 MHz the cartilaginous response found showed similarity in the results of the treated group and the control group in the first weeks.

The same authors found that if the treatment was delayed until the third or fourth week, the ultrasound would stimulate chondrogenesis. In our study there was statistical similarity between the groups with respect to all measurements of chondral production at the third and fourth weeks. This was confirmed in our study by the decrease in immature bone formation and osteoblastic proliferation in the USPSA treated group.

Our model, which investigated hyaline or fibrous chondral regeneration, found a tendency to form hyaline cartilage over fibrocartilage in knees submitted to USPSA therapy, but did not have statistical correspondence. And in our study of osteochondral region, the vascular proliferation parameter did not show statistical significance.

The presence of differentiated organization in terms of remodeling as well as by the presence of chondrocyte layer, cartilaginous matrix and chondrocyte niches were similar in both Group A and Group B with and without the application of USPSA.

7 CONCLUSIONS

The animal model selected and the formatting of the histological analysis were appropriate for the proposed research.

The use of pulsed ultrasound with a frequency of 1MHz, at 20%, with frequency modulation of 16Hz, 0.5 W/cm² of intensity, and an application time of 5 minutes in acute osteochondral lesions showed similar statistical significance in chondral regeneration compared to the Control Group.

In the application of USPSA in the proliferative phase (third and fourth weeks) of acute osteochondral lesions there was a decrease in osteoblastic proliferation and immature bone formation.

The parameters of ultrasonic emission applied in the treatment of acute osteochondral lesions should continue to be studied, as these presented here constitute only one of the numerous therapeutic possibilities of this modality.

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CHAPTER 2

Remdesivir: a strategy to confront the COVID-19 virus

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ABSTRACT

December 2019, a new type of coronavirus was found to have emerged and the World Health Organization declared a state of public health emergency. In view of this Remdesivir was pointed out in many countries as

a possible candidate for the treatment of Sars-Cov-2. Given these assumptions, this paper aims to highlight the current evidence on the mechanism of action of this drug in cells infected with COVID-19 through a literature review. Remdesivir is defined as a nucleoside analog prodrug substituted with 10-cyano. Its main function is to inhibit viral replication by competing with endogenous nucleotides for viral RNA incorporation. In a randomized double-blind study, intravenous Remdesivir had no efficacy on time to clinical improvement, mortality, or time to viral clearance in patients with severe COVID-19. In another study patients who received Remdesivir had a 10-day faster recovery compared to those who received placebo. It is concluded that one study was able to satisfactorily demonstrate the use of Remdesivir in patients with COVID-19, as patients had a short recovery time compared to placebo. However, more studies are needed to prove the efficacy of the drug in combating coronavirus.

Keywords: Coronavirus, medicines, drug reuse.

1 INTRODUCTION

In December 2019, in the city of Wuhan, belonging to Hubei Province, located in China, a new type of coronavirus was found to have emerged: Sars-Cov-2. In late January 2020, the World Health Organization (WHO) declared a state of public health emergency of international importance. To combat the transmission of the virus and the contagion of the disease among humans, a number of measures have been indicated and adopted, such as, social isolation and *lockdown* (CDC, 2022; HUI, 2017; PARK, 2020; WU et al., 2020).

In the absence of a cure for this new virus, the world's healthcare systems have collapsed. In the quest to find a solution, researchers have focused on drastic measures to understand, monitor, and control the replication and spread of the virus and to seek timely and cost-effective therapeutic strategies in order to suggest promising treatment for hospitalized patients and those in critical states (LOU; SUN; RAO 2014; FDA, 2020)

Scientists found that Remdesivir (GS-5734) could be promising in the treatment of Sars-Cov-2 (COVID-19), as it is an antiviral/antimalarial that was originally developed for the treatment of Ebola virus

and targets viral proteins that block the viral replication machinery and consequently inhibit polymerase. According to Warren et al. (2016), Remdesivir was not yet approved, but even so, on May 1, 2020 it was the first to receive *Food and Drug Administration (FDA)* clearance for emergency use, a fact that demonstrates the importance of having more studies on this drug.

Given these theoretical assumptions, this paper aims to highlight the current evidence on the mechanism of action of this drug in cells infected by COVID-19 and its therapeutic performances against the novel SARS-CoV-2 coronavirus.

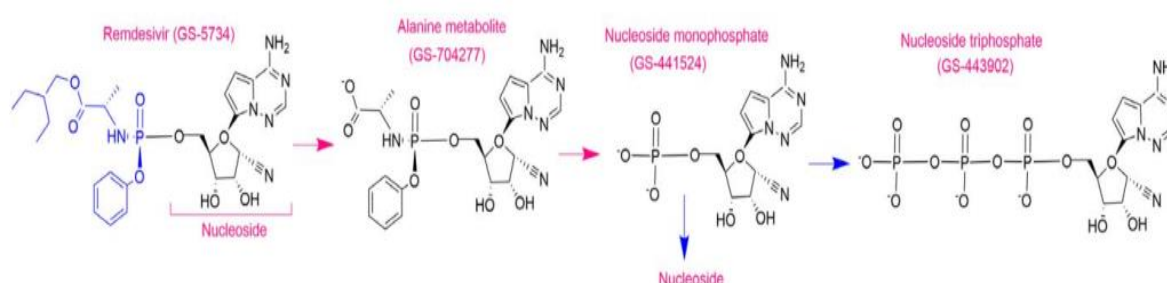
2 METHODOLOGY

This work is a literature review in the Scielo, PubMed and Lilacs article databases. For the search the following terms and key words were used: Remdesivir, COVID-19, Pharmacology and Efficacy. After reading the titles and abstracts of the articles found, as selection criteria articles that contained relationships between Remdesivir and efficacy in the application against COVID-19 were used.

3 RESULTS AND DISCUSSION

Remdesivir (previously GS-5734) (Figure 1) is defined as a monophosphoramidate prodrug of a 10-cyano substituted nucleoside analog (GS-441524). Its main function is to inhibit viral replication by competing with endogenous nucleotides for viral RNA incorporation via RNA-dependent RNA polymerase (RdRp). The RdRp nonstructural protein (nsp12) is intensely conserved in coronaviruses, making it an attractive target for broad-spectrum antiviral drugs. Upon entering cells, GS-5734 undergoes rapid metabolic conversion action by intracellular kinases into its active nucleoside triphosphate metabolite (GS-443902); rate-limiting step for activation of nucleoside analogues and the generation of nucleoside monophosphate (SIEGEL et al., 2017).

Figure 1. Chemical structure of Remdesivir and its metabolites (JORGENSEN, et al. , 2020).



Nucleoside phosphoramidates are monophosphate biosomers and therefore are able to bypass this rate-limiting step, but need to be administered as prodrugs to mask the charged phosphonate group and allow rapid entry into cells. The negative charge of Redemsivir is characterized by 2-ethylbutyl and L-alanine groups that are rapidly removed by intracellular esterases that exhibit high non-structural RdRp

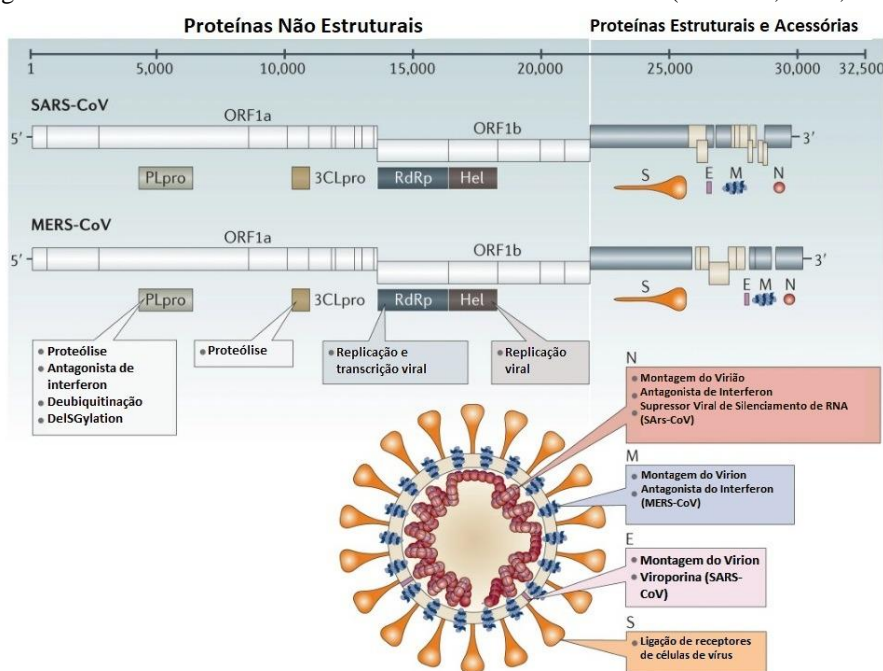
(divergent RNA-dependent RNA polymerases) selectivity when compared to human polymerases (SIEGEL et al., 2017).

The triphosphate form of the inhibitor (RDV-TP) is used as a substrate and competes with its natural counterpart ATP; incorporation of the nucleotide analog was significantly more efficient. Once added to the growing RNA chain, the inhibitor does not cause immediate chain termination. The presence of the 3'-hydroxyl group allows the addition of three more nucleotides until RNA synthesis is stopped at the i+3 position. Therefore, the main possible mechanism of action is delayed RNA chain termination (GORDON et al., 2020).

The typical coronavirus (CoV) genome is a single-stranded, non-segmented RNA genome of approximately 26 to 32 kb. (Figure 2). It contains 5'-methylated caps and 3'-polyadenylated tails and is arranged in the order of 5', replicase genes, genes encoding structural proteins (spike glycoprotein (S), envelope protein (E), membrane protein (M) and nucleocapsid protein (N)), polyadenylated tail and then the 3' end. The open reading frame 1a/b of the partially overlapping 5' terminus (ORF1a/b) is within the 5' two-thirds of the CoV genome and encodes the large replicase polyprotein 1a (pp1a) and pp1ab (GORDON et al., 2020).

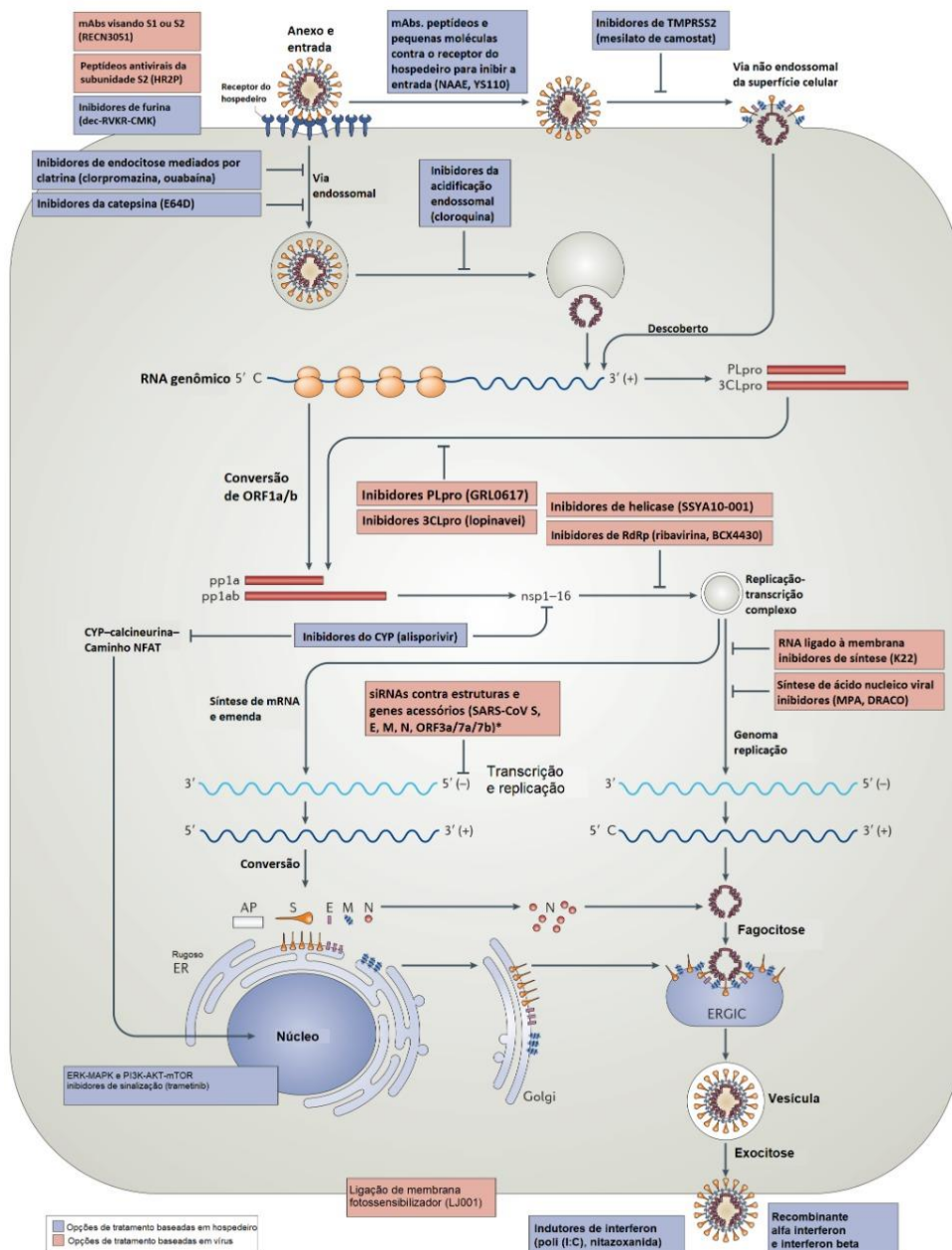
These polyproteins are cleaved by papain-like cysteine protease (PLpro) and serine protease type 3C (3CLpro) to produce nonstructural proteins, including RNA-dependent RNA polymerase (RdRp) and helicase (Hel), which are important enzymes involved in CoV transcription and replication. The one-third 3' of the CoV genome encodes structural proteins (S, E, M and N), which are essential for virus-cell-receptor binding and assembly of the virion, and other non-structural proteins and accessory proteins that may have immunomodulatory effects 297 (PEIRIS, SM, GUAN et al., 2004).

Figure 2. Genome and structures of Sars-Cov-2 and MERS-Cov (ZUMLA, et al., 2016).



Coronaviruses (CoVs) enter the host cell via the endosomal pathway and/or the non-endosomal cell surface pathway. The entry of CoVs into endosomal cells is facilitated by low pH and pH-dependent endosomal cysteine protease cathepsins. CoVs then disseminate intracellularly to release the nucleocapsid and viral RNA into the cytoplasm for translation of ORF1a/b into the large replicase polyprotein 1a (pp1a) and pp1ab and for replication of the genomic RNA. The full-length positive strand genomic RNA is transcribed to form a full-length negative strand template for synthesis of new genomic RNAs and overlapping subgenomic negative strand templates. The subgenomic mRNAs are then synthesized and translated to produce the structural and accessory proteins. The helical nucleocapsid formed by the assembly of the nucleocapsid protein (N) and genomic RNA interacts with the other structural proteins to form the assembled virion, which is then released by exocytosis into the extracellular compartment (Figure 3) (ZUMLA, et al., 2016).

Figure 3. Virus- and host-based treatment options targeting the coronavirus replication cycle (ZUMLA, et al., 2016).



Wang et al. (2020) conducted a randomized double-blind, placebo-controlled study on 255 eligible patients in hospitals in Hubei, China, with oxygen saturation of 94% and stratified according to respiratory support level (no oxygen support, and or high flow oxygen) with symptom onset up to twelve (12) days, with radiological evidence of pneumonia. Remdesivir, was administered intravenously with single daily infusions, starting with 200mg on day 1, 100mg between days 2-10.

The study showed that intravenous Remdesivir had no efficacy on time to clinical improvement, mortality, or time to virus clearance in patients with severe COVID-19 were similar to the placebo group, but there was a 5-day reduction in mean time to clinical improvement. The study did not reach the predetermined sample size because the COVID-19 outbreak was controlled in China, future studies are needed to understand its efficacy and potential (Wang et al. , 2020).

Goldman et al. (2020) conducted a multicenter phase 3 open randomized trial, there were 408 critically ill patients with COVID-19 screened for eligibility, hospitalized patients with confirmed SARS-COV2 infection, with oxygen saturation of 94% or less while breathing on room air and radiological evidence of severe pneumonia. Patients were randomly assigned in a 1:1 ratio to receive intravenous Remdesivir for 5 days or 10 days, at a dose of 200 mg on the first day and 100 mg on the remaining days.

No significant difference in efficacy was found between the 5- and 10-day Remdesivir groups. After adjusting for baseline imbalances in disease severity, the results were similar as measured by several endpoints: clinical status on day 14, time to clinical improvement, recovery, and death from any cause. However, these results cannot be extrapolated to critically ill patients on mechanical ventilation, since few of the patients in the study were on mechanical ventilation before starting Remdesivir treatment. Without placebo control, however, the magnitude of the benefit cannot be determined (Goldman et al., 2020).

Spinner et al. (2020) presented a randomized, open-label trial of hospitalized patients with confirmed coronavirus 2 (SARS-CoV-2) infection of severe acute respiratory syndrome and COVID-19-moderate pneumonia (pulmonary infiltrates and room air oxygen saturation > 94%). Of the 612 patients who consented and were screened for eligibility, 596 were randomized and 584 started the study: 193 started a 10-day course of Remdesivir, 191 patients started a 5-day course of Remdesivir, and 200 continued standard treatment.

Beigel et al. (2020) conducted a randomized, double-blind, multicenter, placebo-controlled study with patients randomly chosen from multiple sites; with intravenous Remdesivir in adults hospitalized with COVID-19, the starting dose used was 200mg on the first day and on the others 100mg for 9 days or until they were discharged or died. They used a sample of 1,062 people. Those who needed mechanical ventilation, supplemental oxygen, and if the measured oxygen saturation was 94% or less while breathing on room air, or if they had tachypnea, were considered to be in critical condition.

Patients who received Remdesivir had 10 days faster recovery compared to those who received placebo who had recovery in 15 days. In the severe disease stratum (957 patients), the average recovery

time was 11 days compared to 18 days. The benefit of Remdesivir was greatest when administered early in the disease, although the benefit persisted in most analyses of symptom duration. With regard to mortality, the Remdesivir group showed significant compared to the placebo group estimates for day 29 were 11.4% and 15.2% in the group without Remdesivir, respectively. The differences in mortality between groups varied considerably according to initial severity (Beigel et al., 2020).

Patients in the Remdesivir group had shorter time to discharge, the initial length of stay was shorter in the Remdesivir group than in the placebo group. Among the 913 patients who received oxygen at enrollment, those in the Remdesivir group continued to receive oxygen for fewer days than patients in the placebo group, and the incidence of new oxygen use among patients who did not go on to receive oxygen at enrollment was lower in the Remdesivir group than in the placebo group. For the 193 patients who received noninvasive ventilation or high-flow oxygen at enrollment, the average duration of use of these interventions was 6 days in the Remdesivir and placebo groups. Among the 573 patients who were not on noninvasive ventilation, high-flow oxygen, invasive ventilation, or Extracorporeal Membrane Oxygenation (ECMO) therapy at the start of the study, the incidence of new noninvasive ventilation or high-flow oxygen use was lower in the Remdesivir group than in the placebo group. Among the 285 patients who were on mechanical ventilation or ECMO at enrollment, patients in the Remdesivir group received these interventions for fewer subsequent days than those in the placebo group (Beigel et al., 2020).

5 CONCLUSIONS

Remdesivir was first created for the Ebola Virus, but treatment was discontinued due to the high rate of side effects in patients. However, in 2020 it returned as a protagonist for the treatment of COVID-19. The first studies did not demonstrate its effectiveness, some of them not completed due to the control of the outbreak, limitation of protocols, viral load not evaluated, open studies and methods that interfered with the final result of the work.

However, one study was able to satisfactorily demonstrate the use of Remdesivir in patients with COVID-19. It showed a short recovery time compared to placebo, an average of 10 to 15 days, hospitalization and discharge times had significant results with an average of 12 to 17 days, and mortality showed relevant data from 11.4% to 15.2%, i.e. Remdesivir was effective in COVID-19.

Therefore, more studies on the drug are needed to ensure safety and quality of life for the patients who use it.

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CHAPTER 3

COVID-19 Vaccines: A Literature Review

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ABSTRACT

Introduction: In 2019, the SARS-Cov-2 virus emerged in Wuhan province, China, causing the pandemic of COVID-19 (R. MOJICA-CRESPO et al, 2020). In Brazil, the first confirmed case of COVID-19 was recorded on February 26, 2020 (MINISTÉRIO DA SAÚDE, 2020). In an effort to reduce the spread of this virus and end the pandemic, scientists around the world have worked to develop efficient and safe vaccines in record time to combat the pathogen. At the time of writing, 104 vaccines are under development, 8 approved by the World Health Organization (WHO, 2020) (KNOLL M D ET AL, 2020) and 4 approved by

Brazil's National Health Surveillance Agency (ANVISA, 2020).

Objective: To determine the difference in susceptibility to develop the severe form of the disease in people who had Covid and were vaccinated, compared to those who were not vaccinated in Brazil. **Material and Methods:** The review was based on articles published in national and international databases, such as Scielo and PubMed, as well as websites of the World Health Organization, Pan American Health Organization, Ministry of Health, National Health Surveillance Agency, among others. **Final Considerations:** The present literature review concluded that the four vaccines approved by ANVISA have proven efficacy in fighting the development, but mainly in aggravating the clinical picture of the new coronavirus disease, with certain exceptions of some vaccines in pregnant women and children due to the lack of data collected from these two specific groups. Thus, besides all the biosafety protocols recommended by the health agencies during the pandemic scenario, it can be seen that vaccination was responsible for controlling the number of new cases of the disease in Brazil and that it brought significant improvement in the lives of those infected by the new coronavirus, avoiding the worsening of the clinical picture and reducing the mortality rate.

Keywords: vaccines, COVID-19, Astrazeneca, CoronaVac, Janssen, Pfizer,

1 INTRODUCTION

HISTORY OF THE PANDEMIC

In 2019, the SARS-Cov-2 virus emerged in Wuhan province, China, causing the pandemic of COVID-19. Such a virus had zoonotic origin, from wild animals and spread rapidly by direct route through contact with the viral particles present in saliva droplets or in aerosol suspension (R. MOJICA-CRESPO et al, 2020).

When these viral particles are able to bind, via the spike protein, to cells (Hosseini et al, 2020), the body can react causing mild symptoms such as body aches, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell, skin rash, or discoloration of fingers or toes (PAHO, 2020). In

addition to these mild symptoms COVID-19 can cause more severe symptoms such as Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV) (PAHO, 2020).

In Brazil, the first confirmed case of COVID-19 was recorded on February 26, 2020 (MINISTÉRIO DA SAÚDE, 2020). However, on November 15, 2021, at 17:20, there were already 21,960,766 confirmed cases and 611,346 deaths from infection with the new coronavirus (PAINEL CORONAVÍRUS, 2021). This rapid dissemination not only caused damage to the health of the population, but also socioeconomic problems such as: difficulty in the economic support of the financial system and the population; mental illness of people in times of confinement and fear for the risk of infection and death; and obstacles in access to essential goods such as food, medicines, transportation, among others (PORTAL FIOCRUZ, 2020).

In the quest to reduce the spread of this virus and stop the pandemic, scientists around the world have worked to develop efficient and safe vaccines in record time to combat the pathogen. At the time of writing, 104 vaccines are under development, 8 approved by the World Health Organization (WHO, 2020) (Knoll M D et al, 2020) and 4 have been approved by Brazil's National Health Surveillance Agency (ANVISA, 2021). These are the Oxford/Astrazeneca, Janssen, CoronaVac and Pfizer vaccines, each with a specific mode of action, efficacy and different costs.

2 HISTORY OF VACCINES

The history of vaccines began in the late 18th century, with the idea of attenuation of virulent infections, developed by physician Edward Jenner, to combat smallpox. It is worth mentioning that, by the end of the 1800s, Europe was living with frequent episodes of smallpox outbreaks. At that time, therefore, the medical class was already mobilized to combat this recurring pathology. However, it was only when English doctors realized that patients affected by the human variant of smallpox, who had already been infected by the bovine variant (cowpox), presented clinical pictures that were notoriously more attenuated and much less aggressive, that a great leap forward in smallpox control was effectively taken. It should be noted that the disease in bovine hosts was called vaccinia, which directly influenced the nomenclature of the new discovery (LARROCA, 2000).

Jenner's conclusion allowed the understanding of two fundamental points: not only an animal variation of the pathology was able to protect humans from severe infections of the human variation, but also the deliberate inoculation of the attenuated pathogen in healthy human individuals could induce future protection without severe manifestation of the disease (CONTI, 2021); this last conclusion was derived from the process called variolization. Variolization consisted in collecting secretion from the skin wounds of patients infected with a mild variation of the disease and infecting healthy humans, with the aim of activating the protective response (known today as immune response). Soon after, it was concluded that this process was analogous to using small amounts of poison to make a person immune to the toxic effects, since the results of the experiments proved to be very efficient and promising. The development of this technique was crucial for the evolution of vaccines, but when Jenner published "An Inquiry into the Causes

and Effects of the Variolae Vaccinae", the work suffered strong criticism and discredit from the medical academy, but undeniably, when it proved effective, about two years after its publication, it became one of the greatest references on the study of immunization at the time.

Therefore, Jenner realized that the use of an animal virus (probably smallpox) could prevent the disease, based on the idea that a virulent agent external to the healthy individual could be inoculated in an attenuated form in humans (PLOTKIN ET AL, 2014) in order to generate a protective response against the aggravation and classic manifestation of the disease. Therefore, a technique that would revolutionize health practices, epidemic control and collective health in Europe and, later, in the world, was born.

Still in the late 18th century and early 19th century, Pasteur had an important contribution to the development of new vaccine techniques, especially in the field of developing the understanding of the protection process against external agents. In fact, the author Tania M. Fernandes (2010) argues that lies, in this specific point, the big difference between the understanding of Jenner and Pasteur:

The central idea, introduced by Jenner, that the smallpox vaccine produced a disease was, as we have already pointed out, accepted by Pasteur. According to this idea, it was not the smallpox virus that was present in the vaccine, but a similar virus modified by dissemination in cattle. Although supporters of the same understanding of the vaccine - as a disease -, there are quite profound differences in the understanding that both assumed about this process, which, for Pasteur, was justified by the presence of a specific etiological agent, whose action was controllable.

That is, in the 19th century, with the advance of technology, but especially the development of microbiology headed by Pasteur, vaccines started to be developed in laboratories and this allowed discovering that immunogenicity could be maintained if bacteria, in particular, were carefully killed by heat or chemical treatment. Importantly, Pasteur's work on pathogen attenuation paved the way for the creation of the first vaccine with live attenuated organisms and inactivated vaccines. Inactivation was first applied to pathogens that cause diseases such as typhoid fever, plague, and cholera bacilli (PLOTKIN ET AL, 2014).

In the early 20th century, the contribution of Pasteur's legacy unfolded further with the work of his pupils Albert Calmette and Camille Guérin, who together were responsible for producing the Bacillus Calmette-Guerin Vaccine, better known as BCG, which was decisive in controlling and combating the dreaded tuberculosis infection.

Already in the first half of the 20th century, there was a major revolution with the discovery that cells could be grown in vitro and used as substrates for viral growth. Enders, Weller and Robbins were responsible for showing that several viruses could be grown in cell cultures. Then, through the selection of clones by passage in cell cultures in vitro, it was possible to create the vaccines against measles, rubella, mumps and varicella. Furthermore, in this period, with the beginning of bacteriology, it was discovered that many of these pathogens were surrounded by a polysaccharide capsule and that antibodies against the capsule were able to promote phagocytosis. Using this information it was possible to develop the

meningococcal polysaccharide vaccine by Artenstein, Gottschlich and collaborators (PLOTKIN ET AL, 2014).

In addition, in the late 20th century, the genetic engineering revolution had a major impact on vaccine development. The first fruit of this revolution was the hepatitis B vaccine (PLOTKIN ET AL, 2014). Furthermore, this revolution gave rise to new techniques, which are much more efficient in production and economical in manufacturing, such as split product, subunit, isolated protein, peptide, marker vaccine, live vector, and nucleic acid approaches (FRANCIS MJ ET AL, 2018). Soon, one can see how the evolution of genetic engineering and vaccines has been crucial for the development of mankind, especially in the field of fighting and preventing infectious diseases, since the principle of vaccination is to induce protection against a pathogen by mimicking its natural interaction with the human immune system (CANOUI ET AL, 2019).

Currently, in the middle of the new coronavirus pandemic, the world and the scientific community have been striving, through vaccines, to minimize the impacts of the virus on individuals and try to re-establish a minimally normal life, as in the pre-pandemic scenario.

3 ASTRAZENECA

3.1 VACCINE PRESENTATION

The ChAdOx nCoV-19 vaccine, better known by the name of its developers and producers: the University of Oxford and the pharmaceutical company AstraZeneca (Oxford-AstraZeneca), is produced using the viral vector model. In Brazil, there is a production partnership with the FioCruz Institute (KNOLL et al, 2021).

3.2 MEANS OF ACTION - OPERATION

The Oxford-AstraZeneca vaccine comprises a single replication-deficient recombinant chimpanzee adenovirus vector expressing the S glycoprotein of SARS CoV-2. After administration, this glycoprotein is expressed on site, stimulating neutralizing antibodies and the cellular immune response (Vaccine Bulletin).

3.3 RESEARCH

Initially, 4 randomized clinical trials were done in 3 different countries: UK, South Africa and Brazil. These studies reported on the safety and efficacy of this vaccine in adults 18 years of age and older. After the results of phase 1 it was concluded that a booster dose would be required 28 days after the first dose.(Knoll et al, 2021). But due to logistical constraints, the interval between dose 1 and dose 2 ranged from 3 to 28 weeks (VACCINE BULLETIN).

3.4 EFFICIENCY

Interim results from the studies that took place in the UK and Brazil showed that in approximately 4 months of follow-up of 11,636 participants (18-55 years old) no hospital admissions for COVID occurred in the participants who received this vaccine, while in the control group 10 participants went to hospital because of the virus (KNOLL et al, 2021).

3.5 COST

According to the TCU (Federal Audit Court) the unit price of the Oxford-AstraZeneca vaccine produced by Fiocruz is R\$19.87.

3.6 TRANSPORTATION

This vaccine must be conserved under refrigeration (2 to 8°C), it must not be frozen and it must be kept in its original package in order to protect from light. After the withdrawal of the first dose, keep the vial at room temperature (up to 30°C), and use it within 6 hours or, store it under refrigeration (2 to 8°C) and use it within 48 hours (VACCINE BULLETIN).

3.7 CONTRAINDICATIONS AND ADVERSE REACTIONS

Contraindications are: hypersensitivity to the active ingredient or to any of the excipients of the covid-19 (recombinant) vaccine, patients who have suffered significant venous and/or arterial thrombosis in combination with thrombocytopenia after vaccination with any covid-19 vaccine, and individuals who have had previous episodes of Capillary Extravasation Syndrome (see the Warnings and Precautions section) (VACCINE BULLETIN).

Adverse reactions of vaccination can be divided by frequency: **Very common** as headache, nausea, myalgia, arthralgia, injection site tenderness, injection site pain, injection site heat sensation, injection site pruritus, injection site ecchymosis, fatigue, malaise, fever, chills; **Common:** Vomiting, diarrhea, pain in extremities, swelling at injection site, erythema at injection site, induration at injection site, pyrexia, influenza-like symptoms; **Uncommon:** Hyperhidrosis, pruritus, rash, urticaria, abdominal pain, dizziness, drowsiness, decreased appetite, lymphadenopathy. In the elderly (≥ 65 years of age), these reactions were generally milder and less frequently reported (Vaccine Bulletin).

3.8 PEDIATRIC, ADOLESCENT AND PREGNANT USE

The use of AstraZeneca vaccine in pregnant women has not been extensively researched; animal studies have not indicated any direct or indirect harmful effects on pregnancy, embryofetal development, parturition or postnatal development. Therefore, as a precautionary measure, vaccination with AstraZeneca vaccine is not recommended during pregnancy (VACCINE BULLETIN).

The safety and effectiveness of covid-19 (recombinant) vaccine in children and adolescents (less than 18 years of age) have not been established.

4 CORONAVAC

4.1 VACCINE PRESENTATION

CoronaVac (developed by Sinovac Life Sciences, Beijing, China) is presented as an injectable suspension, and can be monodose or multidose (with two or ten doses). One dose is composed of 0.5 mL containing 600 SU of inactivated SARS-CoV-2 virus antigen each and should be administered intramuscularly.

Excipients: aluminum hydroxide, disodium hydrogen phosphate, sodium dihydrogen phosphate, sodium chloride and water for injections.

4.2 MEANS OF ACTION - OPERATION

CoronaVac is a vaccine that works with inactivated, i.e. killed, virus. In immunizers of this type, the virus reaches this state through the use of chemicals (those used in CoronaVac are formaldehyde - which prevents the growth of microorganisms in various products - and beta-propiolactone. These compounds lead the virus to death), which make up the method used in the production of CoronaVac, although there are other means, such as irradiation or heat (BUTANTAN, 2021).

Inactivated virus vaccines are more stable, easy to transport and store, and because the virus is dead, they produce few adverse events, as opposed to attenuated virus vaccines, in which the virus remains alive (BUTANTAN, 2021).

4.3 RESEARCH

CoronaVac, an inactivated whole virus SARS-CoV-2 candidate vaccine developed by Sinovac Life Sciences (Beijing, China), has been in phase 3 trials since mid-2020 in Brazil, Indonesia, Chile, and Turkey. On April 28, 2021, it was approved in 22 countries for emergency use.(TANRIOVER, MINE DURUSU et al, 2021)

4.4 EFFICIENCY

A large phase 3 study in Brazil showed that two doses, given 14 days apart, had efficacy of 51% [95% confidence interval (CI): 36%-62%] against symptomatic SARS-CoV-2 infection, 100% (95% CI: 17%-100%) against severe COVID-19, and 100% (95% CI: 56%-100%) against hospitalization, starting 14 days after the second dose of vaccination. No COVID-19-related deaths occurred in the vaccinated group; there was one COVID-19-related death in the placebo group. Vaccine efficacy was maintained in groups with and without comorbidities and regardless of prior SARS-CoV-2 infection. The mean duration of follow-up was 73 days (PAHO, 2021).

4.5 COST

According to the TCU (Tribunal de Contas da União), the unit cost of the CoronaVac vaccine is R\$58.20.

4.6 TRANSPORTATION

The vaccine must be stored and transported under refrigeration, between +2°C and +8°C, protected from light and must not be frozen. If kept under appropriate conditions, the vaccine is valid for 12 months from the date of manufacture (Vaccine Bulletin).

4.7 CONTRAINDICATIONS AND ADVERSE REACTIONS

The vaccine is contraindicated for people allergic to any components of the product, described in item 4.1, besides individuals with fever, acute illness and acute onset of chronic diseases (VACCINE BULLETIN).

Adverse reactions are divided according to age (adults and elderly), frequency of cases, and whether it is a local or systemic symptom.

In adults (18-59 years old), up to 7 days after the administration of the second dose, it is **very common to have**, as systemic adverse reactions, headache and fatigue; and locally, pain. Moreover, it is **common to have** as systemic reactions: nausea, diarrhea, myalgia, chills, loss of appetite, cough, arthralgia, pruritus, rhinorrhea, and nasal congestion; and locally: erythema, swelling, induration, and pruritus. Finally, it is **uncommon to have** systemic reactions such as vomiting, fever, exanthema, allergic reaction, oropharyngeal pain, odynophagia, sneezing, asthenia, dizziness, abdominal pain, somnolence, malaise, flushing, pain in the extremities, upper abdominal pain, back pain, vertigo, dyspnea, and edema; as well as hematoma locally.

In the elderly (over 60 years old), up to 7 days after the administration of the second dose, it is **very common to have** local pain. It is also **common to have**, as systemic reactions, nausea, diarrhea, headache, fatigue, myalgia, cough, arthralgia, pruritus, rhinorrhea, odynophagia, and nasal congestion; and, as local reactions, pruritus, erythema, local edema, and induration. Finally, it is **uncommon to have** systemic reactions such as vomiting, chills, decreased appetite, allergic reaction, asthenia, dizziness, ecchymosis, hypothermia and discomfort in the limbs, and hematoma as a local reaction (Vaccine Bulletin).

4.8 PEDIATRIC, ADOLESCENT AND PREGNANT USE

There are no results from studies conducted with covid-19 (inactivated) adsorbed vaccine in the pediatric population.

CoronaVac has been shown to be well tolerated with a good safety profile in subjects 18 years and older in phase 1/2 trials, and provided a good humoral response against SARS-CoV -2 (TANRIOVER, MINE DURUSU et al, 2021).

The WHO recommends the use of the Sinovac-CoronaVac vaccine in pregnant women when the benefits of vaccination for pregnant women outweigh the potential risks (PAHO, 2021).

5 JANSSEN

5.1 VACCINE PRESENTATION

Johnson & Johnson pharmaceuticals' Ad26.COV2.S vaccine, known as Janssen, is produced using a recombinant adenovirus vector and was derived from the first clinical isolate of the Wuhan strain in China. (SADOFF et al, 2021)

5.2 MEANS OF ACTION - OPERATION

The vaccine produced by Johnson & Johnson uses the technique of introducing a recombinant adenovirus. According to Freire (2020), the adenovirus has specific programming for human cellular infection and, precisely for this reason, works as a kind of carrier of genetic material external to the individual to be infected. Thus, the technique is effective by removing adenoviral genes, which attribute infectious and harmful characteristics to humans, and replace them by known viral genes. In the case of the Janssen vaccine, the removed gene prevents the adenovirus from replicating itself and any pathological manifestations of the virus from developing. The gene allocated in the adenovirus, on the other hand, belongs to Sars-CoV2 and is responsible for encoding the full length stabilized SPIKE proteins, of the new coronavirus (SADOFF, 2021).

In this way, the technique creates an adenovirus vector that will be deployed in the healthy human organism. The vector then delivers the adenovirus, loaded with the gene that produces the SPIKE protein, to the antigen-presenting cells, which, by means of their own cellular machinery, will produce messenger RNA (mRNA) for translation of the proteins (antigens). Already metabolized, the antigens will be directed to the lymphatic system, to be exposed to the auxiliary T cells. This process triggers the neutralizing humoral immunity in an extremely potent way and cellular immunity, which was polarized towards the Th1 subpopulation, producer of IFN- γ (BOS et al, 2020).

5.3 RESEARCH

The randomized clinical trials started on July 22, 2020, at 12 centers in Belgium and the United States. Randomization was performed via an interactive web response system and stratified according to site with the use of randomly permuted blocks. Participants and investigators remained unaware of trial group assignments throughout the trial. Trial participants included healthy adults aged 18 to 55 years and those aged 65 years and older, with the trial divided into three groups, the youngest in cohort 1a with a target recruitment of 375 participants and cohort 1b an exploratory cohort for in-depth immunogenicity analysis with a target recruitment of 25 participants. The oldest age group was included in cohort 3, with a

target enrollment of 375 participants. Cohort 2 was responsible for collecting long-term data, comparing a single-dose regimen with a two-dose regimen (SADOFF et al, 2021).

5.4 EFFICIENCY

Results showed that neutralizing antibodies against wild-type virus were detected in 90% or more of all participants on day 29 after the first dose of vaccine, regardless of vaccine dose or age group, and reached 96% on day 57 with a further increase in titers in cohort 1a. Titers remained stable until at least day 71. A second dose provided an increase in titer by a factor of 2.6 to 2.9. On day 15, CD4 + T cell responses were detected in 76 to 83% of participants in cohort 1 and in 60 to 67% of those in cohort 3, with a clear bias toward type 1 helper T cells. CD8 + T cell responses were robust overall, but lower in cohort 3 (SADOFF et al, 2021).

No participant stopped the study because of an adverse event. Five serious adverse events occurred: one case of hypotension that was considered by the investigator to be unrelated to the vaccine due to a history of recurrent hypotension; one case of bilateral nephrolithiasis in a participant with a history of kidney stones (unrelated); one case of legionella pneumonia (unrelated); one worsening of multiple sclerosis, which remained undiagnosed for approximately 8 to 10 years based on MRI findings (unrelated); and one case of fever that resulted in hospitalization for suspected Covid-19. In the latter case, the participant recovered within 12 hours and the fever was subsequently considered by the investigator to be vaccine related (SADOFF et al, 2021).

5.5 COST

According to the TCU (Tribunal de Contas da União), the unitary price of the Janssen vaccine is R\$56.30.

5.6 TRANSPORTATION

The conservation of this vaccine must be done as follows: before the first puncture of the vial-ampoule it must be conserved between 2 °C and 8 °C and protected from light. And, after the first puncture of the vial-ampoule, you must use the doses of the vial immediately or keep the vial-ampoule between 2 °C and 8 °C for up to 6 hours.

5.7 CONTRAINDICATIONS AND ADVERSE REACTIONS

The contraindication for this vaccine is only for patients with a history of hypersensitivity to the active substance or to any of the excipients that are part of the formulation.

The **most common** adverse reactions of this vaccine are pain at the injection site (48.6%), headache (38.9%), fatigue (38.2%), myalgia (33.2%), and nausea (14.2%). Cough, arthralgia, and pyrexia are

common (<10%). Tremor, sneezing, skin irritation, hyperhidrosis, muscle weakness, back pain, asthenia, and malaise are **uncommon** (<1%) (Vaccine package insert).

5.8 PEDIATRIC, ADOLESCENT AND PREGNANT USE

The use of this vaccine in pregnancy is not fully evidenced. In animal studies, there is no indication of any direct or indirect harmful effects related to pregnancy. Therefore, the researchers and doctors who developed the vaccine do not advise giving it to pregnant women. Unless indicated by a doctor or dentist.

The safety and effectiveness of Janssen vaccine in children and adolescents (less than 18 years of age) have not been established.

6 PFIZER

6.1 VACCINE PRESENTATION

Produced by the US laboratory Pfizer, in partnership with the German laboratory BioNTech, the Pfizer-BioNTech COVID-19 vaccine (BNT162b2) is a formulated, lipid nanoparticle of nucleoside-modified mRNA encoding the pre-fusion peak glycoprotein of the SARS-CoV-2 causing disease COVID-19. Vaccination consists of 2 doses (30 µg, 0.3 mL each) administered intramuscularly, 3 weeks apart (OLIVER, SARA et al. 2020).

6.2 MEANS OF ACTION - OPERATION

The nucleoside-modified messenger RNA is formulated in lipid nanoparticles, allowing the non-replicating RNA to enter host cells to allow transient expression of the SARS-CoV-2 virus S antigen. The mRNA encodes the integral membrane-bound S protein, with two point mutations in the central helix. Mutation of these two amino acids to proline locks the S protein into an antigenically preferred pre-fusion conformation. The vaccine induces cellular immunity and production of neutralizing antibodies against the spike (S) antigen, which may contribute to protection against COVID-19. (VACCINE GUIDE)

6.3 RESEARCH

A total of 43,548 participants underwent randomization, of which 43,448 received injections: 21,720 with BNT162b2 and 21,728 with placebo. There were 8 cases of Covid-19, with onset at least 7 days after the second dose, among participants assigned to receive BNT162b2 and 162 cases among those assigned to receive placebo; BNT162b2 was 95% effective in preventing Covid-19 (95% credibility interval, 90.3 to 97.6). Similar vaccine efficacy (generally 90 to 100%) was observed in subgroups defined by age, sex, race, ethnicity, baseline body mass index, and presence of coexisting diseases. Among the 10 cases of severe Covid-19 with onset after the first dose, 9 occurred in placebo recipients and 1 in a BNT162b2 recipient. The safety profile of BNT162b2 was characterized by mild to moderate short-term

injection site pain, fatigue, and headache. The incidence of serious adverse events was low and similar in the vaccine and placebo groups (POLACK et al., 2020)

6.4 EFFICIENCY

Pfizer-BioNTech 2-dose COVID-19 vaccination performed 21 days apart showed 95% efficacy with respect to symptomatic disease prevention and was measured 7 days after the second dose. In addition, the vaccine was shown to be effective in all age, racial and ethnic groups.(BANERJI, ALEENA et al.2021).

People previously infected with COVID-19 exhibited robust immune response with the presence of SARS-CoV-2 specific antibodies after one dose of the vaccine, while individuals who had not had the infection before showed similar levels of SARS-CoV-2 specific antibodies to previously infected individuals after the second dose of the vaccine. Possibly this is due to previously infected individuals having acquired natural immunity and the first vaccination acting as a recall injection to their immune system (KHEHRA, NIMRAT et al. 2021).

Since Pfizer began global distribution of the BNT162b2 vaccine in December 2020, the UK was the first to delay the second dose to the maximum 12-week interval in order to conduct research on the efficacy of a single dose of the BNT162b2 vaccine. While a single dose may be effective within 21 days, a second dose within the maximum 12-week interval is still highly recommended and necessary to provide more durable / long-lasting protection (KHEHRA, NIMRAT et al. 2021).

6.5 COST

According to the TCU's (Federal Audit Court) Monitoring Report, the unit cost of the CORMINATY vaccine[®], produced by the American laboratory Pfizer, in partnership with the German laboratory BioNTech is R\$56.30.

6.6 TRANSPORTATION

Tozinameran vaccine is transported in dry ice containers and stored at approximately -70°C. The vaccine is distributed as a frozen suspension in a 0.45 ml volume, preservative-free, multi-dose vial. After dilution with 1.8 ml of 0.9% sodium chloride injection, each vial contains up to 6 dosages of 0.3 ml. Once thawed, the vaccine should not be frozen again (PADDA, INDERBIR S. et al. 2021).

6.7 CONTRAINDICATIONS AND ADVERSE REACTIONS

The adverse effects reported were Injection site tenderness/pain, Injection site swelling, Injection site redness, Fever, Fatigue, Headache, Muscle pain, Chills, Joint pain, Nausea, Malaise, Lymphadenopathy, Severe allergic reaction (rare) and Temporary unilateral facial tilt (rare) (PADDA, INDERBIR S. et al. 2021).

Allergic reactions to vaccines are attributed to the inactive ingredients or excipients. They are necessary and added for specific purposes, and represent the main contributor to immediate and specific IgE-mediated reactions associated with vaccines. Patients who have an immediate or severe allergic reaction to the vaccine should not receive a second dose (BANERJI, ALEENA et al.2021).

6.8 PEDIATRIC, ADOLESCENT AND PREGNANT USE

6.8.1 Use for pregnant women

Pfizer's vaccine received final registration from Anvisa on February 23, 2021 (ANVISA, 2021).

Studies indicate that the two doses of the BNT162b2 vaccine produced satisfactory immune response against SARS-CoV-2 virus although SARS-CoV-2 IgG levels are lower in pregnant women than those observed in non-pregnant women. The results of adverse reactions in the population vaccinated with the two doses of this vaccine do not indicate any safety concerns (BOOKSTEIN PERETZ, S. et al. 2021).

6.8.2 Use for adolescents aged 12 to 15 years

Anvisa authorized the application of the vaccine for people over 12 years old on June 11, 2021 (ANVISA, 2021).

Studies indicate that the BNT162b2 vaccine has a favorable safety profile and produced a more efficient immune response in this age group than the immune response produced by this same vaccine in young adults, 16 to 25 years of age (FRENCK, JR. RW et al).

6.8.3 Use for children from 5 to 11 years old

To date, Anvisa has not authorized application of the vaccine for children under 12 years old in Brazil, but the laboratory requested on 11/12 that the agency include this age group in the vaccination campaign. At the production date of this article, the request is still under analysis (ANVISA, 2021). By way of comparison, in some countries, such as the USA, the use for children between 5 and 11 years of age is permitted.

For this age group, the vaccine is supplied in a vial with an orange cap and an orange border label. This vial should not be used in individuals 12 years of age and older. When preparing the multiple-dose vial as described, the content should be diluted with a sterile 0.9% sodium chloride injection (Health Care Provider Information Sheet, 2021).

7 FINAL CONSIDERATIONS

The present literature review concluded that the four vaccines approved by ANVISA have proven efficacy in fighting the development, but especially in worsening the clinical picture of the new coronavirus disease, with certain exceptions of some vaccines in pregnant women and children due to the lack of data collected from these two specific groups. Thus, besides all the biosafety protocols recommended by the

health agencies during the pandemic scenario, it can be seen that vaccination was responsible for controlling the number of new cases of the disease in Brazil.

However, it should be noted that at the time of writing, the Covid-19 Pandemic has not yet ended, so much of the fundamental data for a more in-depth and robust analysis has yet to be generated, collected, and analyzed. Despite this academically unfavorable scenario for definitive conclusions, this work is in line with the view of author Gordon Ada (2007), of the Immunology and Genetics division at the Australian National University, who has analyzed an extensive list of infectious diseases and how the number of cases of infected people increased or decreased after the use of vaccines. In his work, he compares data from past epidemics, before and after vaccines were developed. The result, according to the author himself, in his quantitative tables and graphs, demonstrates the effectiveness of immunizers in effectively decreasing the number of infected people, at a rate of over 99%, with *outcomes* ranging from encouraging to extraordinarily good.

Therefore, anchored in the solid literature review on vaccines and the pathologies they control throughout the research process, this paper, although it still needs more concrete data that have not yet been fully processed around the world, tends to affirm that mass vaccination has brought significant improvement in the lives of those infected by the new coronavirus, avoiding the worsening of the clinical picture and reducing the mortality rate.

It is also noteworthy that, for the sake of this necessary search for a better understanding of the virus, the Ministry of Health started in May 2021 a survey on the prevalence of infection by SARS-COV-2 in Brazil (PrevCOV). This survey will be the most comprehensive on the subject in the world, as it will involve 27 capital cities and their metropolitan regions and 62,097 households in 274 municipalities, the equivalent of 211,129 people. The objective of this study is to show the magnitude of virus circulation in Brazil and how and in which states, capitals and metropolitan regions SARS-CoV-2 infection has been more intense. With this study, the Ministry of Health will be able to monitor vaccination data, indicating whether the population has taken the first and second dose of vaccines offered (PAHO, 2021). This research is still in progress, but it will be important to provide subsidies to improve public policies to confront the pandemic by health authorities (PAHO, 2021).

Moreover, additional information has been gathered on the effectiveness of the vaccines, such as the mechanism of action, the process until the proof of effectiveness, the cost, transportation, contraindications, adverse reactions, and specificities of the use of each one in children and pregnant women, in order for the reader to have a more comprehensive notion of each immunizer.

Finally, the low number of studies on the use of vaccines in pregnant women and children was verified as a limitation of the research.

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CHAPTER 4

Evolution of the acute uveitic phase in Vogt-Koyanagi-Harada Syndrome

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ABSTRACT

Background: Vogt-Koyanagi-Harada (VKH) disease is an inflammatory and autoimmune condition characterized by panuveitis, serous retinal detachments and extraocular manifestations of the

auditory, integumentary and central nervous systems. Patients with VKH can have good final outcomes if treated promptly with immunosuppressive agents and thus avoid complications. The purpose of this article is to report the evolution of the acute uveitis phase of VKH.

Case Report: We report a case of a 58 years old women who presented to ophthalmology emergency room with a 10-day history of a severe headache and progressive low visual acuity in the left eye (LE). After seven days she developed low visual acuity (VA) in other eye and important tinnitus in her left ear. Ophthalmological examination showed best-corrected visual acuity (BCVA) of 20/200 in both eyes; direct and consensual motor reflexes decreased bilaterally; anterior chamber reaction with 2+ cells in both eyes. At Fundoscopy: bilaterally hyperemic optic discs, serous retinal detachment, retinal folds in the papillomacular bundle and Dalen-Fuchs nodules. Angiofluoresceinography (AGF) showed bilateral macular hyperfluorescence (pinpoints). Optical Coherence Tomography (OCT) showed bilateral subretinal fluid and loss of foveal depression. Oral prednisone 1,2mg/kg/day and topical dexamethasone were introduced with progressive tapering for 9 months with complete improvement in VA of the right eye and partial improvement in VA of the left eye.

Conclusion: VKH can cause vision loss and blindness. Early diagnosis and adequate treatment with immuno-suppressive agents may halt disease progression and prevent recurrences and vision loss.

Keywords: panuveitis, corticosteroid, retinal detachment, tinnitus.

1 INTRODUCTION

Vogt-Koyanagi-Harada (VKH) disease is an immune-mediated disorder affecting both eyes. Although the exact cause of Vogt-Koyanagi-Harada disease is unclear, the most accepted mechanism involves a viral-triggered, T-cell-mediated autoimmune response against melanocyte-associated antigens in a genetically vulnerable individual. This typically manifests in several different stages during the disease course: the prodromal phase, acute uveitic phase, convalescent phase and chronic recurrent phase^{1,2,3}.

Several sets of diagnostic criteria have been proposed. The Revised Diagnostic Criteria (RDC) are widely used at present and are highly sensitive and specific. The RDC divide VKH disease into 3 categories— complete, incomplete, and probable — and do not allow a decision concerning a definite diagnosis for patients without any extraocular manifestation^{4,5}. It is required bilateral ocular involvement, characteristic neurological/auditory and dermatological involvement without ocular trauma or surgery, and no other clinical or laboratory evidence to suggest an alternative diagnosis^{1,6,7}.

There have been trials of multiple different treatment regimens over the years, but the best evidence for effectiveness in both short and long term is with early and aggressive high-dose systemic corticosteroids with a slow oral taper over at least 6 months. Rapidly stopping corticosteroids increases the chance of recurrence¹.

2 CASE REPORT

A 58 years old Caucasian woman who presented to the ophthalmology emergency room of the Irmandade da Santa Casa de Misericórdia de São Paulo – ISCMSP with a 10-day history of a severe headache and progressive low visual acuity in the left eye. After seven days she developed low visual acuity (VA) in other eye and important tinnitus in her left ear. She denied use of tobacco smoking, alcohol and substance abuse. The patient denied ocular trauma, previous eye surgery, medication use, arthralgia, skin lesions and genitourinary symptoms.

The ophthalmological examination showed best-corrected visual acuity (BCVA) of 20/200 in both eyes. Direct and consensual motor reflexes decreased bilaterally. At anterior segment biomicroscopy: anterior chamber reaction with 2+ cells in both eyes. At Fundoscopy: bilateral hyperemic optic discs, diffuse serous retinal detachment, changes in the vitreoretinal interface, retinal folds in the papillomacular bundle and presence of Dalen-Fuchs nodules.

Additional tests were requested: retinography of the right eye (Figures 1A and B) and left eye (Figures 2A and 2B) showed bilateral hyperemic optic discs, serous retinal detachment, retinal folds in the papillomacular bundle and Dalen-Fuchs nodules; angiofluoresceinography (AGF) of the right eye (Figure 3A) and left eye (Figure 3B) evidenced diffuse hyperfluorescence in the initial phase, macular hyperfluorescence points (pinpoints) with contrast leakage at a late stage and diffuse accumulation of contrast mainly in the left eye below the macula; optical coherence tomography (OCT) of the right eye (Figure 4) and left eye (Figure 5) showed loss of foveal depression and presence of subretinal fluid (serous retinal detachment); and serological tests with negative results.

Oral prednisone 1,2mg/kg/day (100mg/day) and 01 drop every 8 hours of topical dexamethasone 0,1% in both eyes were introduced. After 15 days of treatment BCVA of 20/50 in right eye and 20/70 in left eye with partial improvement of the optic disc hyperemia and serous retinal detachment (Figures 6 and 7). Slow tapered of dexamethasone dose to 01 drop every 08 hours and maintained oral prednisone dose.

At 30 days of treatment BCVA of 20/20 in the right eye and 20/30 in the left eye with complete improvement of the optic disc hyperemia of the right eye (Figure 8) and partial improvement of the optic disc hyperemia of the left eye (Figure 9), and complete resolution of the serous retinal detachment of both eyes (Figures 10 and 11). Slow tapered of dexamethasone dose to 01 drop every 12 hours and oral prednisone to 1,0mg/kg/day (80mg/day).

After 30 days of treatment, tapered 10mg of prednisone per month and suspended dexamethasone. Patient had BCVA improvement to 20/20 in the right eye and 20/25 in the left eye and sustained without corticosteroid after 9 months of treatment.

Figure 1A – Retinography of the right eye: hyperemic optic disc, serous retinal detachment and retinal folds in the papillomacular bundle



Figure 1B – Retinography of the right eye: Dalen-Fuchs nodules



Figure 2A– Retinography of the left eye: hyperemic optic disc, serous retinal detachment and retinal folds in the papillomacular bundle.



Figure 2B – Retinography of the left eye: Dalen-Fuchs nodules.



Figure 3A – Angiofluoresceinography of the right eye: diffuse hyperfluorescence in the initial phase, macular hyperfluorescence points (pinpoints) with contrast leakage at a late stage and diffuse accumulation of contrast below the macula.



Figure 3B – Angiofluoresceinography of the left eye: diffuse hyperfluorescence in the initial phase, macular hyperfluorescence points (pinpoints) with contrast leakage at a late stage and diffuse accumulation of contrast below the macula.

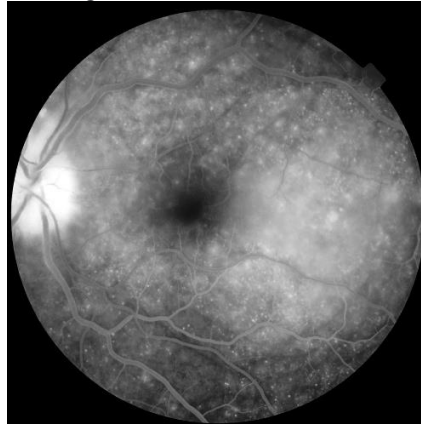


Figure 4 – Optical coherence tomography of the right eye: loss of foveal depression and presence of subretinal fluid (serous retinal detachment).

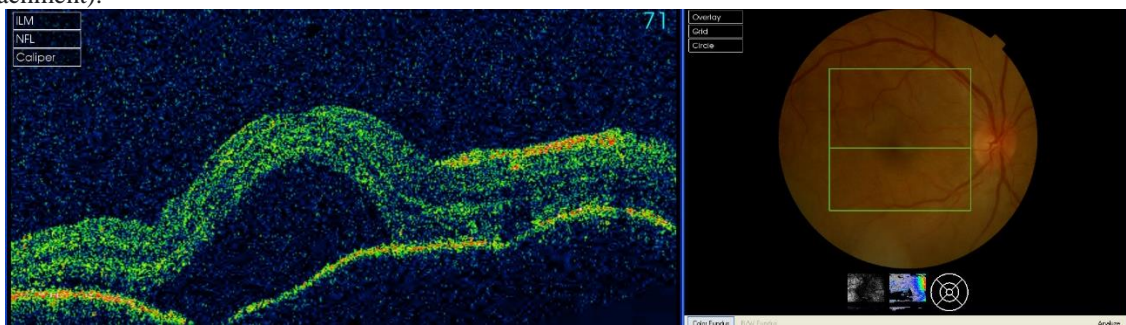


Figure 5 – Optical coherence tomography of the left eye: loss of foveal depression and presence of subretinal fluid (serous retinal detachment).

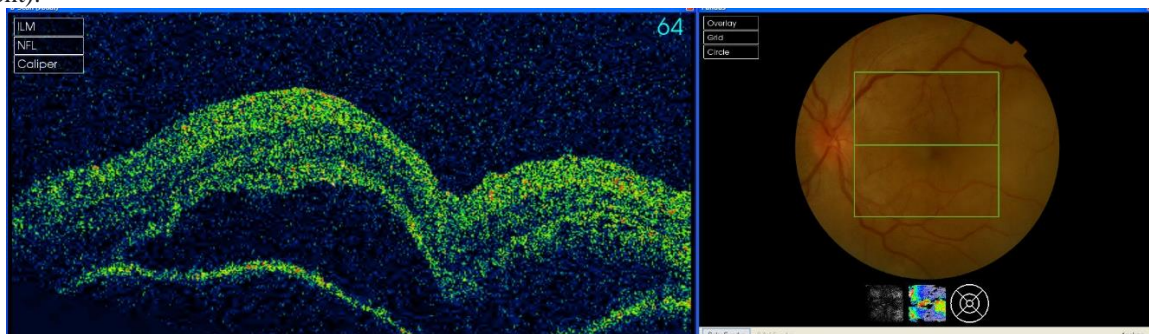


Figure 6 – Retinography of the right eye after 15 days of treatment: partial improvement of the optic disc hyperemia and serous retinal detachment



Figure 7 – Retinography of the left eye after 15 days of treatment: partial improvement of the optic disc hyperemia and serous retinal detachment.



Figure 8 – Retinography of the right eye after 30 days of treatment: complete improvement of the optic disc hyperemia.



Figure 9 – Retinography of the left eye after 30 days of treatment: partial improvement of the optic disc hyperemia.



Figure 10 – Optical coherence tomography of the right eye: foveal depression and complete improvement of subretinal fluid (serous retinal detachment).

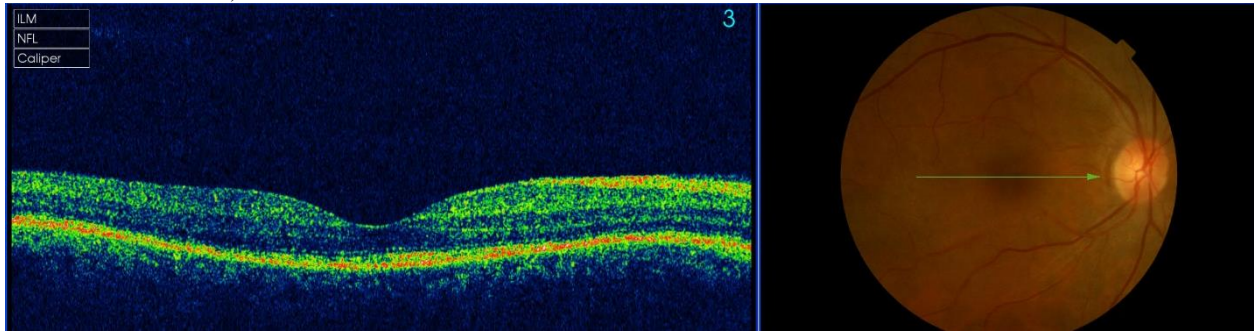
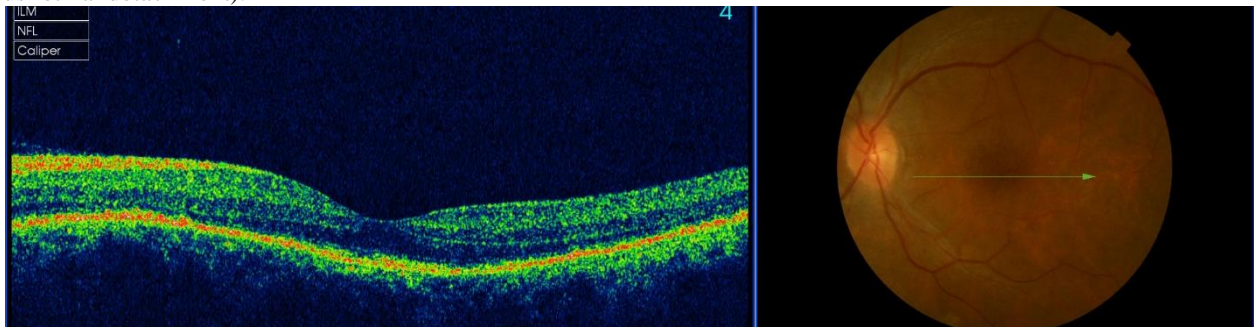


Figure 11 – Optical coherence tomography of the left eye: foveal depression and complete improvement of subretinal fluid (serous retinal detachment).



3 DISCUSSION

There are no laboratory tests that diagnose VKH; rather, the diagnosis is clinical⁸. As such, several sets of diagnostic criteria have been proposed^{4,5,9,10}. The Revised Diagnostic Criteria for VKH Disease classify patients as having complete VKH, incomplete VKH, and probable VKH⁴. Criteria 1 to 4 were filled up as the patient developed a severe headache, low visual acuity in both eyes, important tinnitus in her left ear and the ophthalmological examination showed hyperemic optic discs, serous retinal detachment, Dalen-Fuchs nodules and hyperfluorescence points (pinpoints).

VKH disease classically has four clinical phases including prodromal; acute uveitic; chronic convalescent; and chronic recurrent stage. The prodromal phase usually lasts few days and patients typically complain of neurological and auditory symptoms. Optic disc swelling is rare in this early prodromal phase. However, during the acute uveitic phase, optic disc hyperemia is a frequent finding. In this stage impairment of vision occurs due to diffuse choroiditis and multiple serous retinal detachments. Several weeks later, the disease progresses to the convalescent phase, which is characterized by depigmentation of the choroid “sunset glow fundus”. In this phase, the optic disc may appear pale^{3,11}. We report a case of women in acute uveitis phase: headache, hyperemic optic discs, serous retinal detachment and tinnitus. She did not develop integumentary findings (alopecia, vitiligo or poliosis) because these symptoms occur in the convalescence phase¹². Therefore, the patient would probably fulfill all the criteria being classified in complete VKH⁴ when in the convalescence phase.

The goal of treatment in VKHD is to suppress active ocular inflammation, prevent disease relapse and avoid sight-threatening complications. As such, early diagnosis and rapid commencement of treatment are important in preserving vision in these young patients¹³. Because VKHD can involve multiple organs, the mainstay of treatment is based on high-dose systemic corticosteroids^{14,15}.

Oral prednisone at a dose of 1–2 mg/kg/day started early in the course of the disease followed by slow tapering to avoid recurrences is the generally accepted regimen. Slow tapering of the corticosteroid dose, with frequent follow-up examinations, is warranted in order to avoid recurrence of posterior segment inflammation. Therefore, the patient used 1,2mg/kg/day of oral prednisone at the diagnosis and slow tapered in the following 9 months.

4 CONCLUSION



It is very important to recognize Vogt-Koyanagi-Harada disease early and to start appropriate treatment—most commonly high-dose of corticosteroids—since preventing long-term visual loss and other potential complications depends on starting treatment early. The prognosis is generally good with continued immunosuppression. Follow-up is important to identify and act on any complications.

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CHAPTER 5

Building a pedagogical practice: learning to learn with science teaching in the Semear Hospital Class

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ABSTRACT

With the implementation of its first Hospital Class in 2015, the state of Pernambuco took the first step towards the inclusion of children and adolescents towards ensuring schooling for students in a state of illness and hospitalized for health treatment. The thesis brought a qualitative research, of the case study type, associated with a theoretical-scientific survey in the hospital context, having carried out an analysis with the objectives of seeking to understand Hospital Pedagogy as a distinguished proposal in the construction of knowledge, through contexts of learning for teacher training, the inclusion and schooling of the student/patient inserted in the special education section of the Municipal Teaching Network of Recife. With the purpose of accessing this

environment through science teaching, we learned to learn with Semear by examining the collected material, using discursive textual analysis as an aid to understand the phenomena investigated in the Class. Backed by theoretical references, the work clarifies the development of this teaching modality in the Pernambuco State, the legal bases that guides it in Brazil, its discussion on special and inclusive education, and the character of specialized teacher training that should comprise this space of health and schooling as a space for interdisciplinary humanized care, bringing results where the role of science education is promising for the understanding of the world of students and their daily relationships, woven by behavioral attitudes towards the facts of life, made possible by the humanization characteristic of the Class, which enables the generation of meaningful learning for students/patients. In conclusion, the relevance of educational inclusion for children who need care should permeate education and health, a binomial of inclusion in the Hospital Class throughout the State of Pernambuco.

Keywords: hospital class, teacher training, pedagogy, sickness.

1 INTRODUCTION

In Brazil, the educational pedagogical service to students in health treatment is performed differently than in a regular class, and the pedagogue together with a multidisciplinary team, through hospital classes, performs the important task of teaching. To guarantee this service, there are several legal devices, such as the Federal Law no. 13.716, of 09/24/2018, one of the latest regulations that seek to guarantee the service.

The management of elementary school and child education is, in priority, responsibility of the Municipalities, according to our Federal Constitution, while the states are responsible, fundamentally, for high school and elementary school. The consolidation process of the Hospital Class has been occurring in a scenario where social movements are militating in favor of children's rights, through public policies created in the process of re-democratization of the country.

The first hospital class in Pernambuco, implemented in March 2015 by the Municipal Education Network of the Recife City Hall, in partnership with the Support Group for Children with Cancer - GAC/PE, at the Pediatric Onco-Hematology Center of the Oswaldo Cruz University Hospital - CEONHPE/HUOC, enables the continuity of schooling for patients undergoing cancer treatment. The first hospital class in Pernambuco, implemented in March 2015 by the Municipal Education Network of the Recife City Hall, in partnership with the Support Group for Children with Cancer - GAC/PE, at the Pediatric Onco-Hematology Center of the Oswaldo Cruz University Hospital - CEONHPE/HUOC, enables the continuity of schooling of patients under cancer treatment.

The History of Science as a field of study, Martins (2005) reveals to us, presents influences of two causal types: an internalist approach that concerns the concepts, theories, and facts that compete and reinforce each other, and an externalist approach that concerns the social, political, and economic aspects of the space-time to which science was and is exposed.

Science teaching, when adequately worked on in the school environment, provides students with the construction of answers to the several questions, leading them to the permanent reasoning exercise, when the question comes: why? Curious by nature, they are curious to know the origin of things and their causes, exploring what seems to be different and intriguing.

Teaching Science for Rodrigues (1987),

must demonstrate that science is one of the forms of production of human reality, because, by opposing natural and spontaneous knowledge, it developed This knowledge and this mastery opens the door to the construction of a new reality and a new world in the natural order. This reality is produced by the incorporation and transformation of nature, according to human needs (RODRIGUES, 1987, p. 106).

The hospital class teachers need to develop skills for their interaction with these children, being predisposed to affective exchanges, with sensitivity to the physical and emotional behaviors found in the environment. This special look may guarantee a better condition to actively articulate learning and overcoming relationships during the illness phase.

It is necessary to invest in teacher training, permanently seeking a progressive training for the educator, to which Paulo Freire referred to so much:

It is extremely important to deal with Hospital Pedagogy because of its relevance to school success. We point out that the hospital environment, by its nature, becomes more humanized when there is an eminent partnership among family, school, and professionals from the several areas involved, who aim at a single objective: to benefit the patient's (student's) well-being during the hospitalization period.

According to the policy of the Ministry of Education (MEC) of Brazil, the presence of teachers in hospitals is essential for the schooling of hospitalized children and youngsters, according to the patterns of regular school, contributing to reduce school failure and the high rates of dropout and repetition that affect them, "[...] Hospital Class is a hospital environment that enables the educational care of hospitalized

children and youngsters who need special education and who are under hospital treatment". (BRASIL, 1994, p. 20).

The public policies defined for social and school inclusion of citizens with special needs in Brazil arise to correct a situation still present in society, the segregation that curtails rights and hinders the full development of the educatee, since, until the beginning of the century, the Brazilian educational system provided a regular school and another special school.

In Brazil, as early as 1961, with the promulgation of the Law of Directives and Bases for National Education nº 4.024/61, which in general terms condemned or fought against any unequal treatment, whether for philosophical, political, or religious convictions, as well as any class or race prejudice, it indicated the need for Special Education services, stating in the Article 88 that "the education of the exceptional must, as much as possible, fit into the general education system, in order to integrate them into the community".

The educational system that recognizes and values their processes and differences have inclusive education projects:

A school is distinguished by a quality education, capable of forming people in the standards required by a more evolved and humanitarian society, when it is able to: bring students closer to each other; treat subjects as means to get to know the world and the people around us better; and have families and the community as partners in the elaboration and fulfillment of the school project (Mantoan, p. 34, 2003).

With the restructuring of the State Department of Education as of 1971, the Department of Special Education was created, giving priority to administrative and pedagogical issues, directed to activities such as prevention, identification, screening, evaluation, and educational assistance, with the function of regulating, coordinating, promoting, and disseminating specialized education as a consequence of law no. 5.692/71 (BRASIL, 1971).

In this meantime, it is verified that the exceptionality, in the condition in which the education of people with disabilities does not fit into the general system, should constitute a specialized one, becoming a subsystem at the edges, indicating a space to be occupied, for Mantoan (2003) it implies a conception of partial insertion, when the system foresees the integration of educational services.

The integration process occurs in an educational structure that offers the student the opportunity to move within the school system - from regular class to specialized education - in all its forms of attendance: specialized schools, specialized classes in regular schools, itinerant education, resource rooms, hospital classes, home schooling, and more (Mantoan, p. 18, 2003).

The Statute of the Child and Adolescent, Brazil (1990), better known as ECA, recognizes the importance of the right to education. We highlight the creation of the Statute of Hospitalized Children and Adolescents, Brazil (1995), through Resolution no. 41 of October 1995, referenced by the Brazilian Society of Pediatrics (SBP) and by the National Council of Children and Adolescents (CONANDA), containing twenty subjects aiming to guarantee the Rights of hospitalized children and adolescents, among them the

right to education, highlighting (our emphasis) the monitoring of the school curriculum during their hospital permanency:

1. The right to the protection of life and health, with absolute priority and without any form discrimination. 2. The right to be hospitalized for treatment when it is necessary, without distinction of social class, economic condition, race or religious belief. 3. The right to not be or remain unnecessarily hospitalized for any reasons other than the best treatment of his illness. 4. The right to be accompanied by the mother, father or guardian during the entire period of the hospitalization, as well as to receive visitors. 5. The right to not be separated from the mother at birth. 6. Right to receive breastfeeding without restrictions. 7. Right to do not feel pain, when there are means to avoid it. 8. The right to have proper knowledge of their illness, of the therapeutic and diagnostic care to be used, of the prognosis, respecting their cognitive phase, as well as to receive psychological support, when necessary. 9. **Right to enjoy some form of recreation, health educational programs, monitoring of school curriculum, during their hospital stay.** 10. The right for parents or guardians to actively participate in the prognosis, treatment, and prognosis, receiving information on the procedures that will undergo. 11. Right to receive spiritual and religious support as practiced by your family. 12. The right not to be subjected to clinical trials, diagnostic and therapeutic tests, without the informed consent of the parents or guardians and of their own, when they have the discernment to do so. 13. Right to receive all available therapeutic resources for cure, rehabilitation, and/or secondary and tertiary prevention. 14. The right of protection against any form of discrimination, neglect or mistreatment. 15. The right to be respected for their physical, psychological, and moral integrity. 16. Right to the preservation of their image, identity, autonomy of values, personal space and objects. 17. The right not to be used by the media, without the expressed will of their parents or guardians, or their personal will, in an ethical manner. 18. The right to confidentiality of their clinical data, as well as the right to be informed of the data stored in the institution for the period of time stipulated by law. 19. The right to have their constitutional rights and those contained in the Statute of the Child and Adolescent fully respected by hospitals. 20. The right to a dignifying death, along with their relatives, when all available therapeutic resources have been exhausted. (BRAZIL, 1995).

The Brazilian educational system is regulated by the Federal Constitution of 1988, with the Constitutional Amendment no. 14, of 1996, and the Law of Directives and Bases of National Education (LDB), established by law no. 9394, of 1996.

According to LDB 9394/96, Brazilian education is composed by two levels: basic education and higher education.

Basic education, defined in Article no. 21, is presented in three stages. Its purpose, according to Article no. 22, is the development of the student, ensuring the indispensable education required for the exercise of citizenship, and providing the means to succeed at work and in further studies:

Early Childhood Education - kindergartens (0 to 3 years old) and preschools (4 and 5 years old) - Free, but not compulsory. It is the competence of the municipalities.

Early Childhood Education - daycare centers (0 to 3 years old) and pre-schools (4 and 5 years old) - Free, but not compulsory. It is under the jurisdiction of the municipalities.

Elementary School - early years (1st to 5th grade) and final years (6th to 9th grade) - Compulsory and free of any charge. The LDB establishes that, gradually, municipalities will be responsible for all elementary education. In practice, the municipalities are responsible for the early years and the States for the final years.

High School - The former secondary school (from 1st to 3rd grade). It is under the responsibility of the States. It can be a vocational technical course, or not.

Brazilian education also has some educational modalities, which permeate all levels of national education; among these is Special Education, which attends to students with special needs, preferably in the regular education system.

The method of Hospital Class teaching is part of the Special Education group coverage, regulated by specific legislation. The Law of Curricular Directives and Bases of National Education 9.394/96, in its Article 4-A brings: it is assured educational services, during the hospitalization period, to the basic education student hospitalized for health treatment in a hospital or home care regimen for a prolonged time, as provided by the Public Power in regulation, in the extent of its federative competence (Included by Law no. 13.716/18).

When referring to special educational needs, it is clear that there is a broad perspective of public care to be contemplated by the policy; among these are the students who are unable to attend school due to illness or convalescence.

Such policies go through several stages, where according to Saraiva (2006, p. 33), "the actors, the coalitions, the processes and emphases are different". These stages meet the peculiarities of the students, emphasizing that their development does not occur in a successive and linear manner, but in several different ways that shape their development.

The National Guidelines for Special Education in Basic Education, established by Resolution No. 2, of September 11, 2001, in Article 3, has defined the special education as a modality of school education, as an educational process:

defined by a pedagogical proposal that ensures special educational resources and services, institutionally organized to support, to complement, to supplement and, in some cases, to replace common educational services, in order to guarantee the school education and to promote the development of the students potential with special educational needs, in all of the stages and forms of basic education (BRAZIL, 2001).

The broad dimension of the special educational needs proposed in the special education policy is reinforced by the contribution of the Resolution CNE/CEB n° 02/2001, which in its article 13, proposes the principle of intersectoriality with guarantees of access to education for the hospitalized student:

The educational systems, through integrated actions with the health systems, must organize specialized educational services for students who are unable to attend classes due to health treatment that requires hospitalization, ambulatory care, or long-term permanence at home (BRASIL, 2001).

In this document, the concepts of hospital classrooms and home care are used for the first time, in paragraph 1 of 13, summarizing their functions and objectives:

The hospital classes and home care services must provide continuity to the development process and the learning process of students enrolled in basic education schools, contributing

to their return and reintegration into the school group, and develop a flexible curriculum with children, young people, and adults who are not enrolled in the local educational system, thereby enabling their subsequent access to the regular school (BRAZIL, 2001).

In this way, the Resolution defines the legal bases that support the institutionalization, in the public sphere, of hospital classes. The document entitled *HOSPITAL CLASSES AND PEDAGOGICAL HOME CARE - STRATEGIES AND GUIDELINES* of the Ministry of Education - Secretary of Special Education, 2002, is now mandatory, and establishes political actions for organizing the educational care system in hospital and home environments, in order to ensure basic education access and attention to special educational needs, due to the health problem that makes it impossible for the student to attend school or to be in special homes, support homes, nursing homes, or other structures of society.

Considering the particularities of pedagogical work in hospital classes, the teacher who will work in the hospital classes must be qualified:

to work with human diversity and different cultural experiences, identifying the special educational needs of students unable to attend school, defining and implementing strategies for curricular flexibility and adaptation. It must also propose didactic-pedagogical procedures and alternative practices needed for the teaching-learning process of the students, as well as being available for team work and advice to schools, regarding the inclusion of students who are away from the educational system, whether in their return or for their entrance. (BRAZIL, 2002, p. 22).

The challenge of this teaching modality is to make the intercession between the two rights: education and health, considering what is specific in each area, to develop a work in a perspective of integrated actions, and mutual contributions.

Becoming ill is a transitory event, but it can leave scars, since the legislations that guide this matter are new. In Pernambuco, with the implementation of the Decree No. 29.914/06 and in the city of Recife, with the Decree No. 28.622/15, new perspectives emerge regarding public policies for the interaction between education and health.

The Hospital Class presents itself as one of the alternatives to make a scientific connection between teaching, caring, and learning, combining interests, allowing education, care, and health to go beyond technicism, creating interactions that originate from this context, enabling the insertion of the hospital class for an inclusive education.

In this sense, Fonseca (1999, pg. 33), reflects that hospitalization may repress the social interactive relationships of the student, which are fundamental to make learning possible, and in this perspective, the absence of learning relationships mediated by the teacher may lead hospitalized children and adolescents to the loss of educational opportunities.

As we go through the educational moment by Science Teaching, we come across the motto "School for All", a school that must recognize and respect the differences of students, that is, that understands that everyone can learn, thus becoming inclusive. And in this perspective, using Krasilchick's reflection (2004,

p. 89): "students begin to study scientific content relevant to their lives, in order to identify problems and seek solutions to them.

The formal space is only one of the places where teaching, languages, and explanations are reflected. The student, the subject of his learning, brings his own referential, as well as that of the social group to which he belongs, through languages, concepts, and explanations. And from this perspective, it is necessary that the teacher builds a close relationship with the student/patient before the pedagogical work, thus gaining the student's trust and performing a dialogical journey that seeks to establish affective bonds and generate safety in the coexistence.

In this way, supported by trust and understanding, the educator establishes the teaching and learning process, a fact that makes the educator not only a teacher, but also a friend, a comrade, and a partner in this educational process.

It is worth remembering that the education of the ill child is not an exclusive responsibility of the hospital, it is, rather, a task that is done in partnerships. The hospital establishes the construction of dialogic spaces between the family and the school; exercising, with a mediator posture, the recognition of the outstanding role of each link of this articulation to accomplish the attendance to the child's needs (ORTIZ; FREITAS, 2005, p. 59).

Supported by the concern to offer advances in the area of special education, Brazil (2020), in the National Plan for Special Education, emphasized that:

Basic education students enrolled in the education system (public or private) who are unable to attend school due to (public or private) health treatment have the right to educational care in hospital classes or in home care (including support homes), whether or not they are part of the target audience for special education.

These students should receive from each school system, public or private, specific learning support services, according to their singularities and demands, through teachers and multiprofessional teams, according to the assumptions of equitable and inclusive education, based on the text of Law No. 13.716, 2018, which amends Law No. 9.394, 1996, (Law of Directives and Bases of National Education), to ensure educational care to basic education students hospitalized for health treatment in a hospital or home regime for an extended period of time. (BRASIL, 2020, p. 80).

This Law No. 13.716, changed the text of the LDB to article 4-A, Brazil (2018), bringing the following statement:

It is ensured educational care, during the period of hospitalization, to the student of basic education hospitalized for health treatment in a hospital or home regime for an extended period of time, as provided by the Public Power in regulation, in the sphere of its federative competence. (BRASIL, 2018).

As a result, if a basic education student is hospitalized for health treatment, he or she is guaranteed the right to educational care, it is worth mentioning that the specialized service that characterizes special education, is taken to the student in the hospital class, when dealing with a child affected by retinoblastoma of the eye, a disease that is more common in childhood, that can lead to blindness, for example, also requiring specialized care.

Such linkages have brought a dubious character of special education into the education system, that although it indicates the specific service that takes into account the differences and needs of the students, there are no references in these instruments to the specifics of the education to be provided to students with disabilities, and there is no determination regarding its mandatory nature.

Learning to learn, in Masetto's (2000) reflection, is supported in the sense of learning that makes us, or makes us capable of building and transforming information into knowledge, into life, everything you learn, apprehend and do, totally modifying life perspectives previously unknown and now present, where for the author:

The concept of teaching is more directly linked to a subject (which is the teacher) who, through his actions, transmits knowledge and experiences to the student who is obliged to receive, absorb and reproduce the information received. The concept of learning is more directly linked to the subject (which is the learner) who, through his actions, involving himself, other colleagues and the teacher, seeks and acquires information, gives meaning to knowledge, produces reflections and knowledge of his own, researches, dialogues, debates, develops personal and professional skills, ethical attitudes, political attitudes, changes behavior, transfers learning, integrates theoretical concepts with practical realities, relates and contextualizes experiences, giving meaning to the different practices of everyday life, develops critical thinking and the ability to consider and look at facts and phenomena from different perspectives, compares positions and theories, solves problems. In a word, the learner grows and develops. And where does the teacher stand in this process? Does he or she disappear? Absolutely. He has the opportunity to fulfill his true role: that of mediator between the student and his learning, the facilitator, the motivator of this learning (MASETTO, 2000, p. 139-140).

2 MATERIALS AND METHODS

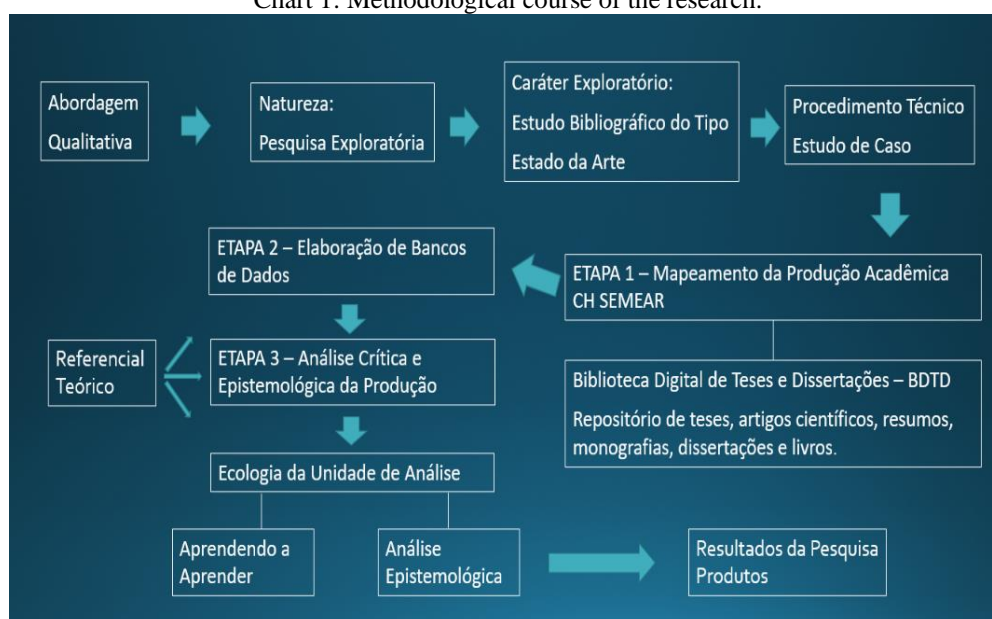
The main objective of this research was to analyze, based on science teaching, the contributions of different pedagogical practices to the inclusion and education of students/patients, and the consequent teacher qualification, in the Semear Hospital Class, which was implemented by the Recife City Hall, at CEONHPE/HUOC.

In chart 1, we present the methodological path through which we have built our investigation: the choices, the definition of the research object, the main concepts and utilized categories, attempting to dialogue with the theoretical perspectives that have guided the analysis that we aim to accomplish in this work.

The first challenge was to understand methodology as a dynamic relationship between the real world and the subject, with its identity and potentialities, with an inseparable link between the objective world and subjectivity, which often can not be expressed in numbers (MINAYO, 2007).

We based our methodology on the qualitative research approach, believing in a greater theoretical and methodological freedom, associated with the theoretical and scientific survey of information about qualification, the pedagogical practice of the hospital class, the guarantee of schooling, humanization, and inclusion.

Chart 1: Methodological course of the research.



Source: Elaborated by the Author, 2021.

- QUALITATIVE APPROACH (ABORDAGEM QUALITATIVA)
- NATURE: EXPLORATORY RESEARCH (NATUREZA: PESQUISA EXPLORATÓRIA)
- EXPLORATORY CHARACTER: STATE OF THE ART BIBLIOGRAPHICAL STUDY (CARÁTER EXPLORATÓRIO: ESTUDO BIBLIOGRÁFICO DO TIPO ESTADO DA ARTE)
- TECHNICAL PROCEDURE (PROCEDIMENTO TÉCNICO) CASE STUDY (ESTUDO DE CASO)
- STEP 1 – MAPPING OF THE CH SEMEAR ACADEMIC PRODUCTION (ETAPA 1 – MAPEAMENTO DA PRODUÇÃO ACADÊMICA CH SEMEAR)
- DIGITAL LIBRARY OF THESES AND DISSERTATIONS – BDTD THESES REPOSITORY, CIENTIFICAL ARTICLES, RESUMES, MONOGRAPHS, DISSERTATIONS AND BOOKS (BIBLIOTECA DIGITAL DE TESES E DISSERTAÇÕES - BDTD REPOSITÓRIO DE RESES, ARTIGOS CIENTÍFICOS, RESUMOS, MONOGRAFIAS, DISSERTAÇÕES E LIVROS)
- STEP 2 – DATABASE ELABORATION (ELABORAÇÃO DO BANCO DE DADOS)
- STEP 3 - CRITICAL AND EPISTEMIOLOGICAL ANALYSIS OF THE PRODUCTION (ANÁLISE CRÍTICA E EPISTEMIOLÓGICA DA PRODUÇÃO)
- THEORETICAL REFERENCE (REFERENCIAL TEÓRICO)
- ECOLOGY OF THE ANALYSIS UNIT (ECOLOGIA DA UNIDADE DE ANÁLISES)
- LEARNING TO LEARN (APRENDENDO A APRENDER)
- EPISTEMIOLOGICAL ANALYSIS (ANÁLISE EPISTEMIOLÓGICA)
- RESEARCH RESULTS (RESULTADOS DA PESQUISA) PRODUCTS (PRODUTOS)

We analyzed the research produced in the Semear Hospital Classroom starting in 2015, year of its creation, seeking subsidies for further study, concomitant to the subjects studied in the national scenario, once that in the local scenario there is little information related to this service. The choice of this locus was previously explained and justified in this project. We highlight the fact that it is the only one in the state of Pernambuco.

In this respect, Martinelli (1999) points to the possibilities of seeking more than indexes, measurements, descriptions, but rather seeking interpretations, more than the gathering of information, seeking individuals and their stories.

Minayo (2016) complements the question when he states that this type of research seeks to answer particular questions, it works with the universe of meanings, motives, aspirations, beliefs, values, attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reduced to the simple operationalization of variables.

In the attempt to better understand the elements used in the research, we treat data qualitatively, conducting a bibliographic research and a single case study, having as locus the Semear Hospital Class, of exploratory-descriptive character, characteristic of participant research in the search to know and act to find an action of change in benefit of the group studied.

After the first contacts with the scientific works about the theme in the universe of the hospital class, we went on to the next stage of the research cycle, characterized by the field work. According to Minayo (2007), the field is understood as the comprehensive space of research, where the work allowed the researcher to approach reality and consequent interaction with the object and its subjects.

We carried out our field observation exploring the hospital classroom and its common spaces, inserted in the hospital complex which comprises the Universitary Hospital Oswaldo Cruz/HUOC of the University of Pernambuco/UPE, the Center of Pediatrical Oncohematology/CEONHPE, the Support Group for Children in Need with Cancer in Pernambuco/GACPE and the Semear Hospital Class, implemented in this complex by the Recife City Hall.

Despite the choice for the qualitative analysis of the research, one must consider that the two modalities are not excluding the other, it is just that they only differ because they have specific functions, where in the specific case the researcher's goal was not the study of the sum of the narratives, not based on the numerical criterion, defining the total number of research subjects based on the saturation of the empirical content researched, based on the objectives listed at the time of proposing the research, considering the disagreements, differences and specificities represented in the statements of the various representations (MINAYO, 2007)

We made use of the field diary with the purpose of recording our actions to be developed, and contributions in this process of pedagogical care in the hospital, understanding that the field diary is an instrument of (in) formation, a tool that allows to consult recorded ideas. According to Oliveira (2014, p.13), "the field diary constitutes a place of research information and training for the research subject".

The field diary was written from our impressions extracted during the visits in the hospital class, in particular at the times of data collection through the surveys, when we will be closer to the research participants.

The Semear Hospital Class works with a multi-serial class, providing pedagogical care in the hospital bed and in the classroom, for students hospitalized in oncologic treatment, with ages ranging from

04 to 14 years old. The students who are not enrolled in their school of origin, but are at school age to attend the classes of Children's Education - Groups 4 and 5 and Elementary School - Early Years, also have this right guaranteed, and their parents and/or guardians are encouraged to have them registered in the class.

The class currently has 3 education professionals, teachers from the Recife Municipal Education Network, only one of whom is a specialist in this modality (Hospital Class) and 35 students/patients, and the multi-professional team will be made up of the professionals who will be attending these patients at CEONHPE.

For data collection, a semi-structured survey was used with the teaching staff, the guardians and the multiprofessional team inserted in the hospital context: social worker, psychologist, nutritionists, medical team, recording in the field diary our impressions during the time the survey was being conducted in order to identify the repercussion of this moment when we were closer to the environment.

As Minayo (2007) states, the interview is a source of information with the objective of providing primary and secondary data and it is through this interview that research based on life stories and their narratives is carried out, proving to be very effective for the achievement of the objectives proposed for our research.

From a qualitative approach, we present data captured in loco, with observation of the space destined to the pedagogical practice and its relations in the environment involving student x teacher, teacher x teacher, teacher x hospital staff, and other interaction with the family. This observation considers the teaching and learning process of the hospitalized children that interfere, in an important way, in the pedagogical practices of the hospital class teachers.

As for the technique of qualitative data analysis of the research, we will categorize the data obtained, from the reading and understanding of its analysis corpus from the interviews, surveys, field diary and other observations obtained in the process, transforming them into valid elements for decision making relevant to the modality.

The participants were divided into 04 (four) groups, being: teachers (03); students/patients (10); parents/guardians (10) and the multiprofessional team (07), the students/patients invited were those in a stable clinical condition and able to study in the classroom, on the 4th floor of CEONHPE, thus, the parents/guardians of these students/patients, therefore, were invited, and the survey was applied at different and subsequent times for these.

The Multi-professional Team (EM), a number of 07 professionals, is composed of physicians, nurses, psychologists, social workers, and nutritionists, and were chosen among those who were available on shift at CEONHPE, being any of the professionals from the "EM" who were on shift, which, in partnership with the teachers, could define the convenience of the presence of the researcher to conduct the interview, based on the clinical and psychological conditions of the student/patient.

The researcher carried out the interviews, with each group, through a survey about the daily routine in the hospital class, and was applied in the classroom, destined for the hospital class on the 4th floor of

CEONHPE, and that lasted an average of 15 to 30 minutes per participant, with a maximum of 04 (four) interviews per day, with a schedule in common agreement with the participants.

The researcher provided paper, colored pencils, and erasers for the children to use, with the purpose of drawing or writing during the activity to answer the survey, as well as pens for the other participants. To answer the questionnaire, we read the questions to everyone, clarifying any doubts that arose.

For the children, besides this reading, we tried to interact with playfulness, observing their understanding condition (alphabetized or not), respecting the limits for this activity (without suggesting them). Recognizing the importance of play, present in various stages of our lives, an extremely important factor for socialization, observation of behaviors and values.

3 RESULTS AND DISCUSSIONS

The University Hospital - HUOC, through the CEONHPE, receives children and adolescents in a state of illness, in various periods of schooling, when, due to the circumstances of the illness, they will be away from the classroom, from their school of origin, for a short or long period of time. To Costa (2008), this fact will lead to prejudice to their schooling development, bringing negative consequences to their psychological state, as well as to their social and family relationships, causing other series of possible illnesses, such as stress, which may harm their recovery.

As far as education is concerned, these children and adolescents may have difficulties in keeping up with the school subjects when they return to school, and if they return, the activities during the health treatment, which may keep them away from the classroom, possibly leading them to fail or to abandon their studies.

From our observations, transcribed in our field diary, it was possible to verify, within CH, that the teaching practice is based on the humanized look of its professionals (multidisciplinary team), in dealing with students/patients, in an environment where health and education converge.

In the diary, we tried to document everything we heard and saw, as well as what we felt and experienced during the field activity. Some notes were recorded in the research setting, others were "digested" on the way from the studied space to our home and/or destination of the day, when, a few hours after the activity, they were documented.

For the research, the field diary became an important tool to seek the success of the data collection process, keeping memories of the presentation of the information that researchers obtain along the way. For Meihy (2005, p. 205), "it should work as an intimate journal in which are recorded even the problems of acceptance of the interviewees' ideas, as well as any theoretical reflection arising from debates on aspects of the subject".

The production of knowledge comprises primarily the dialogicity between teachers and their students, the investigation, diagnosis and treatment of children or adolescents in a state of hospitalized illness, align in a logical and permanent way this dialogism between the health team and their patients, for

Matos and Mugiatti (2009, p. 85), "they do not overlap, because they have very different rules and characteristics according to their purposes and functions to which they are addressed, through each of the selective activities that are integrated in their respective professions".

In this context, we notice common elements involved in the different proposals, whether in the pedagogical action of teaching and learning for the student, or in the cure or recovery of patients, proposals that interact without being confused. Through this dialogical perspective, between both types of communication that present themselves in different ways, once their specificities, moments, and demands, transit with peculiar distinctions translated in the will or search for learning and/or healing of the body.

In the Semear Hospital Class, the pedagogical time is different because of the particularities of the students, according to one of the CH teachers. One hour is the period of permanence in the classroom. The pedagogical activities with the student in school start at 9am. However, before that, the teacher goes around the ambulatory to get information about the names of the students who will be able to attend class either in class or in bed. This is an important task that can change at any time if there are complications in the clinical condition of these students/patients.

When the care is performed in the bed of the infirmaries, the activities are more playful and involve painting and storytelling, always respecting the environment, but building an atmosphere of playfulness in order to captivate the attention for the promotion of teaching and learning. Huoc's pediatric oncology unit has 24 beds, occupying two floors.

In the perception of one of the doctors who assist these children, "The child's story does not end with the diagnosis. The class brings a huge gain in treatment. I'm not just talking about getting well. I'm talking about offering humanization. The ideal is to serve everyone, but we can't put the older ones in the class because there is no agreement with the state, which is responsible for high school."

Semear attends to students in a state of illness and hospitalized in HUOC, in the pediatric oncology sector who attend early childhood education (group 4 and 5) and elementary school years (first to fifth year), linked (enrolled) in the Municipal Education Network of Recife, in the Municipal School Citizen Herbert de Souza, being the Semear hospital class an extension of this School Unit.

In the second semester of 2014, it was made possible by the municipal education network the assignment of the first CH teacher in the Cidadão Herbert School to contribute to the process of implementation of the hospital class, then coordinated by the Support Group for Needy Children with Cancer of Recife - GAC/PE.

The Hospitalization Schooling for Matos and Mugiatti (2012, p. 49), "pointed solutions, which represents the conciliation of interests of the public policies of health and education: bringing it, in its context, the sense of overcoming the contradictions that maintain the problem in evidence", being essential for the execution of the project the participation of the public power, in the guarantee of ensuring a pedagogical space in a room inside the hospital, guided by legal criteria instructed from the existing legislations for the effectiveness of the hospital class considering the possibilities for this teaching modality.

It is worth emphasizing the importance of assuring in the implementation of the hospital class all the administrative and pedagogical bureaucracy, official documentations for the school bond, strengthening the responsible relationship between education and health, each one contributing from its specificities that permeate this policy.

According to one of the CH teachers, each student has its own portfolio, with information about the activities performed and its cognitive development. "Based on this documentation and written tests, sent by the schools of origin, the students are evaluated. In addition, we fill out the online class diary, which is linked to the city hall."

The online Class Diary, is a tool that allows teachers to organize their annual projects, time grids separated by class, class records, among other resources that will facilitate the record of the activities of each professional.

Starting from the premise that the students/patients are in the CH to ensure their regular education before the educational right and the right to health, this will imply the incorporation, in this environment, of a proper ecology according to Fonseca (2008), of new knowledge and socio-educative practices, that transcend the formal dimension already established, converging health, family and social development issues.

In the Hospital Class the student/patient is not treated differently, the charges inherent to education are formalized and adjusted between the parts, such relationship between "educate" and "care" is related to the teacher's performance in the interface of the teaching action that will be given as a teacher's competence.

The relationship is personal, named, ethical, whether with students or with parents and/or guardians, treated with respect, sometimes individually, with specificity, in the classroom or in bed, without trauma or suffering for these students.

4 CONCLUSIONS

The life stories that are told in our daily experiences do not conclude with medical diagnoses; there is a space x time that mediates this relationship, this life process. Even more so when you are a child, and the child you are talking about is still affected by cancer. The students hospitalized in the Semear Hospital Class build their stories every day. We only have to look at their struggle to live, to learn, and to relate socially. This is the only way to understand the importance of a classroom inside a hospital, which although it is a right of every hospitalized child, Semear is the only hospital class in the state of Pernambuco.

The pedagogical listening in the planning of activities in the CH, presented itself as another factor that enables humanization in this environment, as it is a process that makes possible the change of conceptions and postures of the multidisciplinary team involved in the process and in this context of analysis, the understanding of the condition of the student/patient from the educational intervention, concomitant to the hospitalization process.

It is found that the teachers of the Semear Class, fulfill a role more than that of educator, but with the authority built in the relationship with the entire multidisciplinary team, they advise and guide the parents and/or guardians of these students/patients, in the teaching and learning process to which they are submitted, always very careful in the practices and medical recommendations for each student/patient, working together with the other employees who are part of the hospital team.

By analyzing the data presented, it is possible to notice that, to work in the hospital class, the teachers needed to seek a preparation not available in the initial training, and two of the three teachers of the class took the Improvement Course in Educational Service in Hospital and Home Environment, and the third is taking the Specialization Course in Hospital Pedagogy, in order to meet the peculiarities as to practices and methodologies linked to hospital care.

It is worth mentioning that the formation constitutes a favorable environment for the discussions and reflections as to the teacher's performance, moment in which they boost their growth from the practices and experiences acquired in the formation, in the particular case, in a pedagogical environment, especially when it comes to the hospital class.

Reflecting on the Common National Curricular Base/BNCC, we have several challenges for teaching in special education, but also the possibility of renewing their methods, building them in a more meaningful way for the student's life. From this perspective, teacher training will need to undergo a substantial transformation in the training proposals so that so many demands can be met and have an effect in today's society. We understand that even today, teacher formation does not enable teachers to meet all the requirements that the BNCC proposes.

The great discussion on the Hospital Class today tends to have a reflection on the contextual signs regarding its insertion in the modality of special or inclusive education, the fact is that in practice special education is organized to support the development of students, taking place in the opposite shift to the common class, in the school or specialized educational center. Inclusive education, on the other hand, differs from special education in that it is an educational and social process, at the same time, when, in fact, the Hospital Class takes place in environments in the circumstance of hospitalization, as traditionally known, or in the circumstance of outpatient care, during regular school hours.

The Hospital Class is an important concept in the current social context, in which teaching and health are joined, as a right, and as such, it must reflect the changes that society requires, understanding from the needs of curricular adjustments to the teachers' training that attend this teaching modality, according to the current historical moment that provokes and challenges our teachers.

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CHAPTER 6

A look at the approach to corruption in Argentina

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ABSTRACT

The objective of this work was to analyze the phenomenon of corruption and its consequences in democratic societies. Therefore, a search for

information was carried out on its generalities and consequences. Corruption negatively affects the public purposes of the Social Constitutional State of Law, economically disturbing the heritage of a nation, as well as the well-being of society, which negatively affects the quality of life of its citizens, as well as their human rights, social and economic

Keywords: corruption, dimensions and consequences, Argentina.

1 INTRODUCTION

In 2004, the United Nations pointed out the seriousness of the problems and threats posed by corruption to the stability and security of societies by undermining the institutions and values of democracy, ethics and justice. Although the term corruption is frequently heard, a clear definition is not always presented for its understanding, since its understanding is related to both the moral aspect, of the values established by society, and the legal aspect, especially with social customs, theft, robbery, illicit enrichment, improper favoring, kickbacks, bribery, etc. (Mileski, 2011; Martínez Cárdenas and Ramírez Mora, 2020; Katz et al, 2017). Several studies indicate that corruption, as well as violence and greed, is a condition of human nature influenced by the environment: family, religion, education, culture, training, etc., generating changes in the human condition, which generally tend to self-benefit (Batista, 2005). Seña (2002), points out that corrupt acts are those, carried out by two parts, which involve the violation or transgression in an active or passive way of a positional duty or of the function it fulfills. The author points out that this occurs under a normative system that serves as a reference, and are linked to an extra positional benefit, whose acts are generally performed under discretion or ignorance of society.

In this sense and according to the Corruption Perception Index 2018 (CPI) prepared by the Transparency International (TI) Organization, Argentina improved in recent years its location which can be attributed to the "Anti-corruption laws in force". While in the 2019 CPI, the country again increased its score, 49% of citizens indicated their position on an increase in corruption in the country in the last 12 months; 13% indicated that they experienced sexual extortion or know someone who went through this situation; 19% paid some bribe for services; 21% indicated that they were offered bribes in exchange for votes (Coralie Pring, 2019). In the CPI 2020, Argentina worsened its score, attributing this - as in most countries - to the social perception regarding the management of the health crisis exposed by the Covid-19

pandemic (Transparency International, 2020). Therefore, in this article we will analyze the phenomenon of corruption and its consequences in democratic societies.

2 METHODOLOGICAL STRATEGIES OR MATERIAL AND METHODS

The information was obtained by accessing different sources of information from databases such as Scielo, Google Scholar and Redalyc, as well as from legislation, theses and digital journals. The words used as descriptors for the search were: corruption, public sector, causes and consequences of corruption. The information was compiled without time limit or geographic coverage, selecting documents related to the subject. The bibliography was categorized in order to cover the topic from its generalities to its consequences.

3 RESULTS AND DISCUSSION

3.1 GENERAL PRINCIPLES OF CORRUPTION

The notion of corruption is generally associated with the violation of the official's duty of probity in his personal enrichment, which does not only include economic enrichment. It can be defined as the deviation of the conduct of a public official, who deviates from the established norms to serve private interests (Huntingto, 1972). The way in which public power is distributed and exercised is an understood function of public administration, which must be dynamic and objective so that it is distributed equitably and correctly among citizens, taking into account their fundamental rights.

However, the actors of corruption involve the exchange between two wills, the transgression of a relationship of trust or the existence of a certain power of discretion on the part of whoever executes the corrupt behavior, in generally they are internal, proper to the system or assimilated by the system and its officials regardless of the position (Ferreira, Ruíz Díaz and Kunert, 2019). For Orellana, (2003) there are six different forms of corruption: micro-corruption, which is corruption carried out by officials (e.g., theft of office supplies); corruption carried out by managers (e.g., appropriation of public funds entrusted to them for administration); corruption carried out by a criminal association involving managers and officials; corruption carried out by an association between users and officials; corruption carried out by an association between users and managers; and finally, corruption carried out by an association between users, officials and managers.

The typology of corrupt practices is summarized by Gilli (2014), who mentions bribery, influence peddling and co-optation of the State, as some of them. In addition, the author citing Sautu, (2004), provides a broader classification of corrupt acts mentioning patrimonial transfers, granting of privileges, abuse of power, favoritism and clientelism, bribery, extortion, arrangements, fraudulent market alterations, use of and privileged information, among others. Knowledge of corrupt practices is a necessary but not sufficient condition for combating systemic corruption, being necessary to recognize criminal schemes and identify

their weaknesses in order to operate on them, with very few convictions in this regard (Labarqui, 2003; Piana and Arevalo, 2019).

3.2 FACTORS THAT INFLUENCE CORRUPTION

Among the factors that influence corruption and that theory points out as relevant are culture, level of development, degree of social conflict and political and economic institutions, which were addressed by Labarqui (2003). The author sought to verify the explanatory power of these factors and, in particular, to analyze the relationship between the type of regime and the level of corruption, as well as the relationship between economic freedom and corruption. He found that the level of development strongly conditions the quality of the state bureaucracy in terms of recruitment, professionalism, stability and level of remuneration. In addition, he points out that democratization does not necessarily imply an automatic reduction in corruption, since democracy may initially be associated with increased corruption, whether this is an appearance resulting from the greater freedom of the press in democracies, or whether it is a real increase resulting from activities inherent to democracy that may give rise to acts of corruption (such as electoral campaigns). However, he points out that countries that integrate tools such as transparency, accountability, citizen participation and economic freedom in their governance would effectively lead to a drop in corruption levels, reducing opportunities for corruption. He also points out that geographic-cultural differences are relevant in terms of corruption, since countries that have recently transitioned from authoritarianism to democracy and that have highly market-regulated economies have higher levels of corruption.

Miranzo Díaz (2018), points out among the subjective causes of corruption vanity, selfishness, personal satisfaction, craving for power or even social recognition. These behaviors lead to the loss of confidence in the public function, since whoever exercises the corrupt act lacks ethical values, honesty, responsibility, or the sense of public interest and of the Administration as a safeguard of the rights and interests of citizens, and which can also be explained from psychology (Julian and Bonavia, 2020). Furthermore, corruption is a risky behavior (Ackerman and Palifka, 2016), since the person who engages in it must dodge obstacles such as legal restrictions, internal and external controls, the possibility of being betrayed by colleagues or other people involved in the process, etc., and may or may not have the expected result of the act carried out (Fernández Ríos, 1999). In relation to this high rate of reiteration observed in workers who ever commit this type of irregularities, it is precisely a strengthened feeling of impunity, of being above the laws, institutions, and the rest of the elements of state control, as to lack of effective control and previous obstacles to corruption (Miranzo Díaz, 2018). An example of this can be extortion, whereby extra payments are demanded from taxpayers, extra payments to provide public services, such as, for example, the issuance of passports, and from the heads of officials who charge "rents" to their own subordinates by requiring them a certain fixed amount per month or week. Another example is the abuse of bureaucratic discretionary power, among which are carried out by ministers who "sell" their power; officials

who pocket percentages of government contracts, transferring the money to bank accounts abroad; officials who obtain government contracts for themselves, and political parties that use the prospect of coming to power and obtaining "rents" from international business in exchange for government contracts (Wainstein, 2003).

The strength of the regulatory framework in which corruption operates is an essential factor in achieving the eradication of corruption from the Public Administration in general and from public contracts in particular, so that a weakly constructed regulatory system enables, and even favors, irregular behaviors (Simancas Simancas, 2010). Moreover, for criminal law to fulfill its preventive functions, it must have sufficient motivational capacity to deter those who are willing to affect the assets that the legislator considers worthy of protection (Seña, 2016). The weakness of institutional procedures and mechanisms, with weak and incomplete procedures, with no basis in the principles of publicity and transparency, mean that, even if a State has exhaustive administrative and criminal laws to sanction and prevent corruption, these are not respected, making efficient institutional mechanisms for control, monitoring and good governance vulnerable.

The low professionalization of the public sector, that is, of those in charge of designing, directing and participating in a public contract or other administrative procedures, is one of the major doors to corruption. This is mainly due to the politicians' specific lack of specific knowledge of public management required in complex administrative processes such as public procurement, and additionally, they tend to be more exposed to conflicts of interest, being more easily affected by partisan or private interests (Kiltgaard, 2009). Also, the lack of technical or human resources in small public entities means that the civil servants or public employees in question do not have the capacity to specialize in a subject, while the number of people in charge of managing the procedures is reduced. This facilitates the participation of the political classes in a direct way, and on the other hand, the practice of bribes, favors, etc., due to the ease of detecting the center of decision in the development of a procedure, since it is enough to bribe one or two people in which the decision-making power is centralized. So the existence of an administrative body of public professionals, with permanence character, constitutes one of the best means for the prevention of corruption (Villoria Mendieta and Izquierdo Sánchez, 2016).

The lack of independence of managers and control bodies, given by an excessive dependence on their superior bodies, especially senior politicians, prevent their proper functioning, causing great legal insecurity and instability in public managers. This can seriously condition the controls carried out by figures internal to the Administration, who are in charge of evaluating certain activities of the entity beforehand. In addition, the lack of technical and human resources can hinder the tasks of intervention and auditing, as well as the obligations of transparency and publicity. Also, the lack of legal mechanisms that provide clarity and tools to the different actors within the contracting process, and that facilitate an integral performance of the same and an effective control, and not only formal control of the actions of public entities, represent a serious setback in the fight against corruption (Seña, 2016).

The decentralization of public spending, towards privatization and decentralization of political, democratic and economic management, affects the management of public funds, so that the decision-making power of the public function is found in a multitude of contracting entities of different sizes, which are responsible for awarding contracts and distributing public spending, assimilating more to a business model than to the traditional hierarchical line of the Administration (Bautista, 2007). This creates new incentives and general localist interests, giving rise to an agency contract situation in which the agent (the contracting authority) may differ in its interests from those of the principal (the State, other public administrations, etc.) and may give rise to conflicts of interest. Decentralization of the Public Administration also generates a "loss of control" of the activity of the contracting authorities - due to the difficulty in controlling public activity caused by the multiplication of entities to be audited, affecting the power and capacity to control and monitor the agent's decisions (Bardham and Mookherjee, 2006).

3.3 THE CONSEQUENCES OF CORRUPTION

Corruption is a phenomenon that reproduces itself in the face of the precariousness and fragility of the public sphere and of the sense of belonging to it, which is not only perceived in the administration of public resources, but also in all democratic and social processes (Arteaga, 2005). Rodríguez Arana (1996) states that possibly the most perverse effect of corruption is the distortion of the democratic system itself and the consolidation of a way of life rather distant from the habits and virtues proper to democracy, since it affects principles of objectivity, legality, transparency and accountability (Diez Getino and Torija Herrero, 2016).

Corrupt practices create an alternative channel for the processing of different administrative procedures and files, which, through the abuse of public funds, the acquisition of undue privileges and the generation of new rules of the game, replace and destroy the legal-democratic procedural framework, directly attacking the rule of law and governmental efficiency (Villoria Mendieta, 2006; Bautista, 2007). It also affects the very process of creation and planning of public policies and can culminate in an effect on the electoral behavior of voters, since it leads to disaffection and loss of confidence in the institutions, in the Government, and in the Public Sector in general (Lizcano Álvarez and Villoria Mendieta, 2013). The emergence of political ideals and with them the so-called politics of trust, in favor of the credibility, truthfulness and honesty of politicians, regardless of the ideology they profess, increases the population's trust in the Administration, as well as in their political representatives, institutions and public management (Thompson, 2001).

On the other hand, the World Bank has stated that corruption is one of the greatest obstacles to economic and social development, given that it weakens the rule of law and the institutional foundations on which growth depends (Mccarthy, 2015). Corruption has devastating effects on the market and market efficiency (Salinas Jiménez and Salinas Jiménez, 2001). In this sense, corruption can directly impact the citizen through price increases in goods and services produced by companies immersed in corruption (Diez

Getino and Torija Herrero, 2016). It also affects decision making in public spending strategy. In this way, unnecessary services and infrastructures are contracted, guided by corrupt interests -generally large infrastructures that are difficult to evaluate and control (Mauro, 1998). There is, in short, a loss of opportunity for society and for general interests, since these funds, invested in unnecessary aspects, ceased to be used to cover other essential needs of the Welfare State (Holmes, 2015).

4 CONCLUSION OR FINAL CONSIDERATIONS

Corruption is a phenomenon that has undeniably negative consequences, both from a utilitarian and ethical perspective, as it is a betrayal of duty, honesty and integrity in public functions. It undermines the foundations of civilization itself, of the rule of law and of the current democratic and economic system. The search for effective methods to combat corruption is essential for the promotion of economic development, quality of democracy and social justice. Structurally, the effects of corruption are accentuated in the economic development of the country, even more so for a sustainable economic development, since it also affects the incentive institutions.

Corruption represents an obstacle to the achievement of the public purposes pursued in a Social Constitutional State of Law, affecting economically the state patrimony and socially the general interest, due to its negative and destructive impact upon the quality of life of the population and human, social and economic rights.

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CHAPTER 7

The Circular Economy and the Corporate Social Responsibility in Brazil

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ABSTRACT

The main objective of this paper is to examine the relationship between the Circular Economy (CE) and Corporate Social Responsibility (CSR) in Brazil. The work is structured as follows: in a first point the objective, the working hypothesis and the methodology used are defined and problematized; second, both concepts are defined and problematized, including the state of the art on CE and CSR, and are linked to each other, establishing the particularities of each of them; thirdly, in the central part of the work,

the advances achieved in CE and CSR in Brazilian society and economy are exposed and subjected to criticism, in addition to examining how the two variables are linked; Finally, the results reached in the research are presented and discussed, and both the limitations of the work and possible lines of research are exposed.

Keywords: Circular Economy, Corporate Social Responsibility, Brazil.

1 INTRODUCTION

1.1 OBJECTIVE AND STUDY HYPOTHESIS

- The research presented here includes the following categories:
- Entrepreneurship and Entrepreneurial Behavior;
- Organizational Strategy;
- People Management and Workplace Relationships;
- *Marketing*;
- and, lastly, Organizations and Organizational Behavior.

The main objective of the work is to study the reality of the relationship between, on the one hand, the Circular Economy (CE) and, on the other hand, Corporate Social Responsibility (CSR) in Brazil. The working hypothesis, which will be confirmed or refuted in the end, is as follows: the CE is advancing in Brazil thanks to CSR policies, although the existence of the Greenwashing technique, a category that we will define in section 3 of this paper, is observed in relation to the CE, and there is still a political and legislative framework that is not well developed, articulated and harmonized to serve as an impulse and guarantee for new business practices.

2 METHODOLOGY

This work makes use of qualitative methodology, mainly the systematic and critical bibliographic review of both primary and secondary sources. To gather the information, access was gained to Google Scholar and Dialnet repositories, as well as to articles that appeared in the general and economic press, and to documents from public and private organizations related to CE and CSR in Brazil and the rest of the world.

The research is structured as follows: first, a review is made of the state of the science of CE and CSR, after defining both concepts and certain issues that may be of interest; then, the main analysis of the work is carried out, trying to integrate the greatest possible amount of information available to us; after that, the results of the research are presented and discussed in relation to the main objective and the working hypothesis; and, finally, two lines of future research are presented that are considered relevant for future research, our own or that of other colleagues.

3 CIRCULAR ECONOMY AND CORPORATIVE SOCIAL RESPONSABILITY. STATE OF THE ISSUE

The concepts of CE and CSR have been widely discussed and presented not only in the specialized and scientific literature, but also in the mass media in general, for several decades. However, given that they are sometimes used inappropriately, we should first define and characterize both concepts.

Let us begin with CE. At the institutional level, circularity has been defined as that which is a

production and consumption model that involves sharing, renting, reusing, repairing, renewing and recycling existing materials and products as often as possible to create added value. In this way, the life cycle of products is extended (paragraph 3).

The Foundation for the Circular Economy (2017), itself, refers to the essential aspect of CE: "the intersection of environmental, economic and social aspects" (paragraph 9). This is the first key point: the environmental or ecological, economic and social planes constitute lines that cut across each other, one dimension not being able to be separated from the other.

Similarly, Portugal's Ministry of Economy and Digital Transition (2022) considers CE to be

a strategic concept based on the reduction, reuse, recovery and recycling of materials and energy. Replacing the end-of-life concept of the linear economy with new circular flows of reuse, restoration, and renewal in an integrated process, the circular economy is seen as a fundamental element to promote the decoupling of economic growth from increased resource consumption, a relationship that until now has been seen as inexorable (p. 1)

As shown in Image 1, CE forms a chain whose links feed back into each other, constituting a circuit in which the first element, the extraction and processing of raw materials, gives way to a series of phases until the residual waste is once again reincorporated into the new production flow.

Image 1. Cycle of the Circular Economy



Source: EFE Verde (2021).

TRADUÇÃO DA IMAGEM:

Raw materials (MATERIAS PRIMAS)

Design (DISEÑO)

Production - re-elaboration (PRODUCCION REELABORACIÓN)

Distribution (DISTRIBUCIÓN)

Consumption – Reutilization – Repairing (CONSUMO – REUTILIZACIÓN – REPARACIÓN)

Collection (RECOGIDA)

Residual wastes (DESECHOS RESIDUALES)

Recycled (RECICLADO)

In Brazil, the Industry Portal (2022) defines CE as "a concept that associates economic development with better use of natural resources, through new business models and optimization in manufacturing processes with less dependence on virgin raw materials, prioritizing more durable, recyclable and renewable inputs" (paragraph 1)

Therefore, the consulted sources highlight the following strong ideas when referring to the concept of CE:

Tabla 1. CE strength ideas

It is not only a production model, but also a distribution and consumption model.
It is not a matter of recycling for the sake of recycling, or reusing for the sake of reusing, but of doing so in order to generate value from all these materials that would previously have been simply discarded (thus, CE is inseparable from the logic of capitalist accumulation, which is why we can speak of green capitalism).
The main objective is to extend the product life cycle as long as possible.

Just as one cannot separate the sphere of production from the sphere of consumption, neither can one dissociate the economic from the social and environmental, hence the Foundation for a Circular Economy (2017) speaks of *intersection*

The three foundations of CE are economic, social and environmental or ecological.

One of the key aspects of CE is the use of as few new raw materials as possible.

CE is radically opposed to the paradigm of the linear economy: the process of the new economy must be circular.

Source: own elaboration.

In any case, it is worth bearing in mind, as González and Vargas-Hernández (2017) expose, that the principles of CE had a series of precursors, even prior to the postulates and reports of the OECD and other international organizations, including Mollison and Holmgren, at the end of the 1970s, with the practice of permaculture; Industrial Ecology, which had great theoretical exponents, such as Frosch and Gallopoulos (1989); the movement known as The Natural Step, by Robèrt (1989); the model called "Cradle to Cradle" (C2C), whose main representatives were McDonough and Braungart, in the 90's; the philosophy of Regenerative Design, by Lyle (1994) and others; the model known as Natural Capitalism, by L. H. Lovins, A. Lovins and Hawken (2007); the philosophy of Performative Economics, by Stahel (2010) and others; the Blue Economy model, represented mainly by Pauli (2011); or, finally, the Biomimicry approach, defended by Benyus (2012), who relies on the principles of nature as a model, as a measure and as a mentor or guide. All these precedents and precursors helped shape the philosophical and business core of CE. For example, these models have helped the CE to put forward the novel idea of Ecodesign, based on five pillars: increasing the useful life of the product (greater durability, greater loyalty, greater repairability), reuse, recovery and reinsertion in the renewal, reconditioning and remanufacturing circuits; partial recovery (disassembly, standardization and reuse of parts) and, finally, recycling of raw materials (Gonzalez and Vargas-Hernandez, 2017).

Problematizing now the concept of CE, we consider that it is not easy to know to what extent the CE proposal assumed by benchmark companies in Brazil and the rest of the world responds to a marketing strategy or, on the contrary, is a sincere bet that seeks to minimize the negative externalizations on the environment and the reduction of social and economic rights of the majority of society. This is where we can cite the controversial concept of Greenwashing, which we define as a marketing practice that adulterates the original nature, means and ends of CSR and CE.

Let us now look at how CSR is defined, a concept that has its own particularities but which, as we shall see, is also inseparable from the CE paradigm. The idea of CSR began to be used in the 1970s. It was the Organization for Economic Cooperation and Development (OECD, 1976) that sketched out the main lines of what would later be considered CSR; years later, the OECD (2001, 2004) expanded and clarified

the concept of CSR. Indeed, it was the OECD that emphasized the importance of companies considering human rights, concern for the environment, respect for labor rights and the involvement of companies in the communities in which they operate in their corporate philosophies and strategies. The baton was picked up by the UN (1987), which produced the Brundtland Report, which stressed the importance of global corporations making a commitment to protect the environment.

As for the core principles of CSR, the Global Compact for Corporate Social Responsibility (2021) outlined what can be known as the decalogue of CSR, substantiated by the following elements:

- Respect for the protection of fundamental human rights.
- Corporations should not be complicit in the violation of human rights.
- Companies have the obligation to guarantee the right to union assembly and association of workers. Companies must also put an end to all forms of forced labor.
- Corporations have an obligation to contribute to ending child labor.
- Companies must put an end to discriminatory employment practices.
- Companies must maintain a preventive approach that favors and protects the environment.
- Corporations should promote initiatives that encourage greater environmental responsibility.
- Companies should encourage the development and diffusion of environmentally friendly technologies.
- Finally, companies have to make a great effort in the fight against corruption in all its forms.

Let us now review, very briefly, the problematic and complex relationship established between CE and CSR, drawing on the work of González and Vargas-Hernández (2017). If CSR is based, fundamentally, on the triple principle of respect for the environment, sustainable economy and respect for social, labor and human rights, CE is mainly related to the first and second element; however, these are three spheres that cannot be separated.

For example, the creation of a green economy, characterized by the circular model, is inseparable from socially and environmentally responsible commitment. However, the main problem has to do with the clash that occurs, as we shall also see in the Brazilian case, between theory, between the principles of CE and CSR, on the one hand, and reality, the concrete, transparent and measurable applicability of corporate policies that tend to coincide with the fundamentals of CSR and CE.

Thus, if, on the one hand, companies generally tend to conceive, design, produce and sell products that seek to maximize profits and the shortest possible durability, how is it then possible to comply with the fundamental principle of CE: to achieve the longest possible durability and reuse of products, goods and services for sale?

This is certainly one of the most problematic issues when it comes to critically analyzing the real impact and applicability of CE and CSR policies in today's global economy. And the case of Brazil is no exception, as we will try to demonstrate below..

4 THE CIRCULAR ECONOMY AND CORPORATE SOCIAL RESPONSIBILITY IN BRAZIL: A REALITY AS PROBLEMATIC AS IT IS PROMISING

The reality of CE and CSR in Brazil is complex; it is not easy to define and problematize, since it includes both very advanced aspects and a reality that has nothing to do with the fundamental principles of a circular and socially and environmentally responsible economy. There are, therefore, contrasts that need to be critically examined.

Let us first look at the most problematic Brazilian reality in terms of CE and CSR; aspects that are not always officially disclosed and which, therefore, need to be compared with documents and data that help to understand a reality that is to some extent hidden.

One of the biggest problems facing countries in which the principles of CE and CSR are progressively being implemented is to determine to what extent the desire to achieve a more sustainable economy coincides with reality. This is where the phenomenon of Greenwashing comes in, which can be defined as greenwashing, a marketing tactic that is actually a fraudulent practice and distorts the real meaning of a socially and environmentally responsible, resilient and sustainable economy.

In the Brazilian case, reports presented by Market Analysis (2015) and GLOBAL 3000 (2022) leave no room for doubt regarding the fact that in 8 out of 10 products sold in Brazil the practice of Greenwashing has some kind of impact or influence. In particular, the GLOBAL 3000 (2022) study shows how even in a sector such as hydropower there are possible negative externalities that are not always taken into account in official discourses. The problem with this marketing practice is that it generates a false and prefabricated image of environmental responsibility, thus also obscuring the real positive effects of responsible policies on the part of companies. Once again, the terrain in which we are moving is difficult, complex and highly problematic, and always involves discerning what is merely marketing from what is part of a genuine, far-reaching and long-term change.

In this regard, the Federative Republic of Brazil has recently been included in the list of countries in Latin America and the Caribbean, along with the Dominican Republic, Mexico and Jamaica, which imported highly toxic hazardous waste from Europe, although there have also been cases in which the Brazilian authorities banned the export of hazardous batteries from French Guiana. With regard to batteries, it should be noted that, at the legislative level, the Federative Republic of Brazil has a regulatory framework for the handling and management of batteries (ECLAC, 2021), one of the great current workhorses of the circular and socially and environmentally responsible economy. In fact, Brazil currently has the following laws regarding CSR and CE in batteries and batteries, electrical and electronic equipment, packaging, vehicles, tires, lubricating oils and other products: Law No. 12305 (2010), which sanctioned CE through reverse logistics and created the National Solid Waste Policy, and Decree No. 10240 (2020), in addition to Bill No. 7535 on incentives to promote the recycling industry (2017) (Antúnez et al., 2021; ECLAC, 2021). In this regard, we fully agree with researchers Porcelli and Martínez (2018) when they state that

in order to move towards a circular economy, it is necessary to have a regulatory framework that regulates the extended producer responsibility, that encourages the collaborative economy, that regulates the management of plastic, electrical and electronic waste, that obliges the manufacturer and producer to always incorporate a portion of recycled material in each product. (p. 1100).

As for the other side of CE and CSR in Brazil, the promising facet presented by CE and CSR policies in the Latin American country, it is worth mentioning first of all the fiscal framework related to reverse logistics (i.e. the different links that are part of the chain of productive and ecological reuse), which includes a series of incentives such as tax reductions for the circulation of goods and services for recycled inputs. (CEPAL, 2021). We start from the premise set out by the United Nations Environment Programme Finance Initiative (2020) and the research of Antunez. (2021), according to which circular businesses in the United States are currently in the initial stages of development and are mainly focused on the following sectors: agriculture (regeneration and restoration practices), construction (innovative use of buildings, raw materials and city planning) and the manufacture of electrical and electronic equipment (in which logistical collaboration and residency are decisive).

Companies and organizations operating in Brazil such as Petrobras, ENGIE Brasil, BAT Brasil, CTG Brasil, Brookfield Brasil and Eletrobras, among many others, have a formal commitment to the fight against climate change (Teixeira, 2021), one of the priority objectives of both CE and CSR. Other companies are also standing out as leaders in the development of a new economy within the framework of the Sustainable Development Goals, as is the case of FEMSA, committed in practice to the responsible use of water resources; all of them are integrated into regional regions for the promotion of CE and CSR, such as Forum Empresa and RedEAmérica. (Kowszyk y Maher, 2018). It is also important to bear in mind that Brazil has recently created the Brazilian Center for Circular Economy (Hub-EC), led by Exchange 4 Change Brasil (EC4B), which brings together sixteen Brazilian companies and organizations (such as Tomra, Covestro, Equipa Group, Rhein Advogados, the Institute for Technological Development of Brazil or the Center for International Relations of Brazil) and is the first experiment of its kind in Latin America and the Caribbean. Brazil is also the host country of Ball Corporation, the first CE laboratory to be founded in South America (EFE Verde, 2021; ComunicarSe, 2021). In the paper sector in Brazil, for example, highly innovative projects have also been developed that, beyond their quantitative relevance, are of enormous qualitative significance as a business model that other companies based in the Latin American country can emulate (Veolia, 2022).

Regarding water reuse, there are studies, such as the one by Da Silva and Pasold (2019), which confirm that Brazil is progressively becoming a country that gives importance to this field of CE, something outstanding if we take into account that the Federative Republic of Brazil constitutes the first country in the world in terms of water availability in rivers, although much remains to be done in this regard, especially in terms of equitable access of the population to water sources, and there are important gaps in legal matters,

as exemplified by the fact that Brazilian legislation "still does not expressly provide a way to make wastewater reuse processes more efficient". (Da Silva and Pasold, 2019, p. 160).

Despite this, as shown by Da Silva and Pasold (2019), there are many opportunities in the country in terms of water reuse, a resource that is not only relevant and vital for agriculture, but for all industries and the service sector. Precisely because Brazil is the world's leading country in terms of water resources, it is even more important to raise awareness for a better use of such a strategic resource. In any case, the study cited by Da Silva and Pasold (2019) shows a large number of examples that suggest that Brazil has a promising future in this regard, as seen in the cases of Jardim do WTC, Elma Chips, the multinational Nestlé in the ibero-American nation and a long etcetera.

In addition, the project known as Family Biowater, developed by Enel Green Power in the northeastern part of the state of Bahia, is an important example of a sustainable and circular economy, especially in its use of the country's water resources. (Enel Green Power, 2019).

Another encouraging element in the development of a green and socially responsible economy in Brazil has to do with the existence of biogas from landfills, as well as an extraordinarily high tire recovery rate of almost 100%, second only to China, and above countries such as India, Japan, South Korea, the United States, Mexico, Argentina and Nigeria. Brazil has a system of extended producer responsibility (EPR), including reduction targets, which has undoubtedly contributed to achieving very ambitious targets in terms of CE and respect for the environment, not only in tires, but also in the energy sector, cement kilns, granulators, electrical and electronic waste (of which Brazil is the main producer in the Latin American and Caribbean region), batteries and all kinds of batteries, and a long etcetera (Schröder et al., 2020; ECLAC, 2021).

Furthermore, as can be seen from the comprehensive study by ECLAC (2021), the Federative Republic of Brazil, together with Barbados, Paraguay, Bolivia, Belize, etc., has a system of responsibility for single-use plastics, which ensures the reuse of one of the most used and most polluting materials in the world economy today. Regarding plastics, Brazil has introduced, in Law No. 6528/16, an express ban on microplastics in personal care and hygiene products, which are one of the most consumed products in the country. Brazil is one of the few countries in Latin America (along with Brazil, Uruguay, Barbados, Peru, Cuba and Bolivia) that has clear plastic recycling mandates and a very clear federal legal framework for the recycling of plastic bags. However, currently only half of this material is recycled after use, while around 17% of plastic materials are not recycled properly, sometimes ending up burned in the open air or in landfills, with no control over their productive reuse. Of the 80 million tons of waste generated per year, only 4% is recycled (Schröder et al., 2020; United Nations Environment Programme Finance Initiative, 2020; ECLAC, 2021; PLAS-ICT, Technologies and Information for the Circular Economy, 2021).

Another very promising aspect about the reality of CE and CSR in Brazil has to do with the fact that it is the only Latin American country that enjoys a very prominent presence in terms of boosting scientific

production regarding a circular economic model, counting in 2019 with up to 77 publications (ECLAC, 2021).

Although we believe that the Brazilian economy is far from having fully and consistently adopted the principles of the CE and CSR, cases such as Natura and Cattle suggest that the country is gradually moving towards a green economy model. However, even in these two cases, there is clear resistance and obstacles to advancing the paradigm of a socially and environmentally responsible economy. As research by Romis and Coslovsky (2019) and Grazzi (2020) have shown in the case of Natura, the introduction of green technologies in Brazil's production processes currently implies an increase in costs that not all companies are able or willing to assume; the case of the cosmetics company Natura is illustrative of the broad possibilities that a company in an economic sector can have if it assumes both CE and CSR, which are ultimately inseparable: Thus, Natura offers refillable packaging for its hygiene, personal care and beauty products, in addition to using recycled materials, such as recycled PET and glass, or fully recyclable materials for its packaging, such as green plastic made from sugarcane.

It must also be said that consumers, in general, are not willing to see the products they consume become more expensive because they support a green economy. This is obviously a problem that all companies and economies around the world face. The difference is that not all of them can bear the same burden of abandoning less economically costly forms of production (at least directly, if we do not take into account the negative externalities, which can be very costly in the long term), but more harmful from the point of view of sustainability. In spite of this, references in Brazil such as Natura and Cattle show that the path is already mapped out and that it will depend on many social, cultural, political and, of course, economic variables whether these types of business models become the majority in the Brazilian republic.

For example, again referring to the fiscal framework, the fact that in the Federative Republic of Brazil recycled materials are taxed twice (Schröder et al., 2020) is the opposite of an incentive to a new green economy, something that clearly discourages many producers not to stop using virgin materials. This brings us back to the point we made above: if the State does not become the architect of change, it should at least be an agent that does not further hinder the process of converting the linear economy into a circular, sustainable and resilient model.

In any case, again following Romis and Coslovsky (2019), it is already a present reality that Cattle, Natura and so many other companies in Brazil have not only carried out innovations of a technological nature, but also of leadership, management, organization and marketing. This aspect reinforces our thesis that compliance with both CE and CSR involves a holistic approach in which all the elements, dimensions, variables, parameters, etc., must be connected, articulated and overlapping. Clearly, in this whole process the public actor, public administrations, is called upon to play a central role, if not as a guide and organizer of the process, then at least as a generator of a political, legal and fiscal framework that encourages the proliferation and consolidation of companies that combine the principles of CE and CSR in practice. Cases such as the 2016 Rio de Janeiro Olympic Games facilities, during which the modular design and integration

of shared transport services in the real estate offers made it possible to increase efficiency both for building and for transporting hundreds of thousands of people (Schröder et al., 2020), are also a demonstration that for the metamorphosis of the economy to take place it is essential that all the links in the economic chain are involved and articulated.

In our view, it is a matter of ensuring that all actors with a leading role or potential interest see that they need to jump on the bandwagon of a new, more sustainable economic model. Otherwise, the discourse of CE and CSR will remain mere phraseology, with no real applicability or concreteness. But this also means progressively overcoming the extractivist model (or transforming it in the sense of a circular model in terms of waste management and its productive reuse, with a view to minimizing the negative impact of this type of activity), on which many Latin American economies are still dependent to a greater or lesser extent, Brazil, which currently has the fourth largest mining sector in the world and is one of the world's leading exporters of strategic materials such as niobium, iron, manganese, tantalum, graphite and bauxite, with all the environmental and ecological implications this entails, is partly a case in point:

Mining activities involve high water and energy consumption. In addition, the use of toxic substances as part of mineral and metal extraction processes - such as the use of mercury to extract gold - has serious consequences for the health of workers and local communities, 107 as a result of soil and water contamination by mining waste (known as tailings) containing hazardous substances (Schröder *et al.*, 2020, p. 33).

At this point we note, as a new variable to be problematized, the complex issue that within the framework of the capitalist economy there is no necessary coupling or harmony between the fact that a powerful economy such as China's, for example, can develop a circular network for a fundamental *commodity* such as steel and that, at the same time, Brazil can continue to enjoy its position as a major supplier-exporter of iron ore. (Schröder *et al.*, 2020). In other words, in our view, the transformation towards a green economy may require overcoming the current production premises not only in a specific country, not only in a specific node within the world-system, but in the entire global economic network. In this regard, the new approaches expressed in the 2030 Agenda and its seventeen Sustainable Development Goals, whose fundamental aims are universal in nature, have had a strong impact on the application of the principles of CE (Antúnez et al., 2021), inseparable, as we have said, from the postulates that have to do with CSR.

With regard to technological innovation processes, the reality is that the Brazilian economy and society have managed to become one of the main world references in terms of research, innovation and development of technologies and production processes related to forms of green economy such as the so-called Agriculture 4.0, in which the Ibero-American nation stands out, along with Costa Rica and Chile, as one of the leaders in Latin America and the Caribbean, with all that this implies in terms of digital inclusion and employment in a circular economy (Schröder et al., 2020). This shows that Brazil's economy, although it has not yet developed its full potential in terms of resilient and socially, economically and

environmentally sustainable economy, has encouraging and promising assets that allow us to foresee a future in which sustainability as a guiding principle will have a decisive specific weight. In any case, and to problematize this issue, this in no way means that we can speak here of a kind of automatism in the development of a green economy; if the main actors involved in this change (companies, civil society, public administrations) are not willing to transform the roots of the linear and unsustainable model of economy that currently prevails, the elements of innovation to which we are referring will remain minority and somewhat anecdotal examples, or at least without real capacity to determine the economic, social and environmental course of a giant like Brazil..

5 CONCLUSION

Results: with respect to the main objective, it was found that there is a close relationship between the principles of CE and the postulates of CSR, in such a way that the insertion and consolidation of the principles of both should occur simultaneously, within the same development paradigm; sustainability is the element that links the two categories.

The National Solid Waste Policy of the Federative Republic of Brazil is a clear exponent of the intersectionality between circularity and CSR, since this policy is the expression of the synthesis between circular business models and the sustainability of the entire Brazilian society. One of the strong theses that we conclude is that sustainability is inseparable from circularity, so that if a certain model of sustainable development is not implemented, it is impossible to transcend the current paradigm of linear economy. It is also concluded that the process of implementing a circular and socially and ecologically responsible economy in Brazil, which is still in its initial stage of development, will necessarily be slow and will have to overcome a wide range of obstacles and inertia at the social, business, cultural and political levels. Hence the substantive importance of public awareness programs, and how the private sector will assume them and even be creative in generating and disseminating its own programs. But, in any case, the role and specific responsibility of the public authorities will be part of a fundamental variable for both CE and CSR to develop in Brazil from a quantitative and, above all, qualitative point of view..

With regard to the working hypothesis, it is confirmed that, in the context of the peculiar process of development of CE and CSR in Brazil, the circular economy model is advancing in the country, driven by the strategic lines proposed by the CSR paradigm, although it is confirmed that the country faces three essential problems, starting with the abuse of Greenwashing, and finally the low level of development of public programs to raise social awareness of the need to overcome the linear model of the economy, which is highly unsustainable not only from an environmental, but also from an economic and social point of view.

As for future lines of research, we propose the following two: first, to critically analyze the awareness programs being carried out in Brazil by public administrations to bring CE and CSR to fruition, also analyzing their inconsistencies, shortcomings and incongruities; second, we propose to researchers to

delve deeper into the involvement of public authorities in fraudulent practices that distort the true spirit of CE and CSR, as corroborated by the aforementioned practice of Greenwashing.

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CHAPTER 8

MONTE CARLO SIMULATION IN TRIANGULAR IRREGULAR NETWORKS

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ABSTRACT

Working with Digital Terrain Models (DTM) or Geographic Information Systems (GIS), Triangular Irregular Networks (TINs) is one of the most used ways to represent surface topology. Given this form or representation, this article investigates one initial probabilistic demonstration to quantify up to which accuracy σ (*sigma*) can be consider what is ambiguous from the topological point of view in 2D Delaunay triangularizations. To achieve it, we designed an initial demonstration that there is a maximum precision for which the network topology remains constant in a new Delaunay triangulation, at each point individually and in the Triangular Irregular Network as a whole. The methodological approach was experimental. Various mathematical experiments were carried out using the pseudorandom Monte Carlo Simulation method. First, for each point of the Network, and then for all network points for varied σ . The experiments culminate in

helping solve the problem of the existence of maximum σ for which the probability of occurrence in constant triangular irregular network topology is 100%. The mathematical results gave rise to the following: Considering a TIN generated by Delaunay Triangulation, if any point of coordinates (x_i, y_i) in a triangular irregular network is disrupted (has its place altered), according to a Normal distribution $N(\mu, \sigma^2)$, then, exists a value σ_{max} (*sigma* maximum) for which the topology of the Network remains constant. For example, it was found that $\sigma_{max.1}$ of point 1 exists and is obtained by $\sigma_{max.1} = 0.30866$, and in point 2, $\sigma_{max.2} = 0.2$. The results also indicate the following for Triangulated Irregular Networks: Every two-dimensional irregular triangular Network generated by the Delaunay Triangulation has a value σ_* (*sigma* asterisk) to which the network topology remains constant. In this work, simulating the worst case of irregular triangular Network: $\sigma_* = 0.2$. Finally, it is concluded that the σ maximum for each point exists, as well as for the Network as a whole. However, results need to be tested in more extensive networks to prove (or not) if it always happened. We advance the knowledge on the Triangular Irregular Networks combining simulation techniques and network topology.

KEYWORDS: Triangular Irregular Network, Monte Carlo Simulation, Topology, Delaunay triangulation

1 INTRODUCTION

Geospatial sciences work with geometric and Geo-graphic Database (GDB) aspects. In geometric data acquisition, triangulation (Hegeman et al., 2014; Kas-trisios and Tsoulos, 2018; Kim et al., 2010) and/or trilateration (Cheng et al., 2004; Mazuelas et al., 2009) are important methods employed for populating these GDBs. These methods allow the generation of Triangular Irregular Networks (TIN) (Kastrisios and Tsoulos, 2018; Reuter et al., 2007) used in Geographic Information Systems (Kamel Boulos and Geraghty, 2020; Mollalo et al., 2020).

This processing of Irregular Triangle Networks for the generation and extraction of geometrics in GIS is influenced by the errors inherent in each vertex (Florinsky, 2002). In geodetic (Kastrisios and Tsoulos, 2018; Martínez et al., 2005; Sharp et al., 2019; Wang et al., 2000) and

topographic (Florinsky, 2002; Li et al., 2006) triangulations, the distances between vertices are very large, indicating that probably the interference in triangle generation is very small due to the relationship between point accuracy and edge length. However, in a TIN with smaller edges these errors further influence the generation of the triangles, which may vary as the vertex precision is reduced. Such errors indicate the mathematical and physical rigidity of their triangles.

Considering in this context the acquisition of geometries for GIS from triangulation networks, this research aims to understand the following question: to what extent a change in the quality of adjustment, i.e. increasing or decreasing the accuracy in the points, the triangulation would still be considered stable. To attend to this research question, we develop an initial demonstration to show that, there is a maximum precision for which the network topology remains constant after a new Delaunay Triangulation. First simulated at each point initially and then on the TIN as a whole. From these initial experiments, it is possible to recognize patterns capable of generating new TINs with similar triangulation, same topology and same statistical quality as the original.

This article aims to contribute to results that quantify to what accuracy the σ (sigma) can consider what is topologically ambiguous in an Irregular Triangulated Network. We advance the knowledge about the topology of Triangulated Irregular Networks using Monte Carlo simulation techniques (Carmel et al., 2009; Gugiu and Dumitrache, 2005; Wałędzik and Mańdziuk, 2018).

2 THEORETICAL FUNDAMENTATION

Theoretical content about the definition of Triangular Irregular Networks (TIN) by means of Delaunay Triangulation, topology of a TIN, and Monte Carlo simulation method are essential aspects for the understanding of this work.

2.1 THE CREATION OF AN TRIANGULAR IRREGULAR NETWORK

There are several algorithms for generating a Triangular Irregular Network (TIN) from a dot mesh. Among them, Delaunay Triangulation (Kastrisios and Tsoulos, 2018; Zeiler, 1999; Felgueiras and Goodchild, 1995; Tsai, 1993; Fernandes and Menezes, 2005) allows generating triangles as homogeneous and close to an equilateral triangle as possible, optimizing the represented surface. In addition, it is the most popular used for this conversion, and is present in virtually all Geographic Information Systems. Thus, TIN is a vector data format defined by

a triangulation from a set of sample points irregularly distributed in coordinates (x,y), with respective z values, usually referring to altimetry, which allow mathematical modeling of a surface through a network.

2.2 TOPOLOGY OF A TRIANGULAR IRREGULAR NETWORK

The geometric topological vector relationship in an Triangular Irregular Network is the core of this article. According to Casanova et al (2005), topology is the part of mathematics that investigates the properties of configurations that remain invariant in transformations of rotation, translation and scale. These are spatial relations that are independent of geometry, but rather of the *elements of topological vector relationships*. These elements are generically: connectivity, adjacency, and contingency. Erciyes (2013), defines the *connectivity* or *connectedness* of a graph as follows: “A graph is connected if there is a path between any pair of vertices v_1 and v_2 .” The adjacency is the neighborhood information of spatial objects, where an edge determines the left and right polygon. Finally, *contingency* is information about the inclusion of a spatial object within another spatial object. Of these elements of the topological vector relationship, connectivity is essential to the present study, as far as TIN is concerned. The topology of an triangular irregular network is considered constant if, with changing the coordinates of the vertices, the triangles remain the same after a new Delaunay Triangulation.

2.3 MONTE CARLO SIMULATION

Another aspect essential to the understanding of this paper is the Monte Carlo method (Metropolis et al., 1953; Amar, 2006; Mark and Mordechai, 2011), named after the Monte Carlo Casino in the principality of Monaco. It is an application of inferential statistics. Amar (2006) describes some of the algorithms that have been developed to perform Monte Carlo simulations. In this paper, Monte Carlo simulation is used in experimentation on the effect of random errors on each coordinate of an original point in the Triangular Irregular Network.

3 METHOD

In the first stage the initial mathematical modeling is defined. The two-dimensional point being

$$A = \begin{bmatrix} x_1 \\ y_1 \end{bmatrix}$$

In which:

$$(\forall x_1 \in x)(\exists y_1 \in y)((x_1, y_1) \in \mathfrak{R}^2)$$

Your errors being σ_{x_1} e σ_{y_1} associated with the coordinates in x and y ; and its tendencies τ_{x_i} e τ_{y_i} associated to the coordinates in x e y . Mathematically, it starts from the premise of uncertainty associated with the geometric coordinates of each point in a Geographic Database. Therefore, analogously, also associated to line and polygon geometries. From this statement, the true Cartesian coordinate of a point A can be defined by:

$$\hat{A} = \begin{bmatrix} x_1 + \tau_x \pm \sigma_{x_1} \\ y_1 + \tau_y \pm \sigma_{y_1} \end{bmatrix} = \begin{bmatrix} x_1 \\ y_1 \end{bmatrix} + \begin{bmatrix} \tau_x \\ \tau_y \end{bmatrix} \pm \begin{bmatrix} \sigma_{x_1} \\ \sigma_{y_1} \end{bmatrix}$$

So generically the uncertainty of a two-dimensional point can be written as:

$$\hat{P}_i = \begin{bmatrix} x_i + \tau_x \pm \sigma_{x_i} \\ y_i + \tau_y \pm \sigma_{y_i} \end{bmatrix} = \begin{bmatrix} x_i \\ y_i \end{bmatrix} + \begin{bmatrix} \tau_x \\ \tau_y \end{bmatrix} \pm \begin{bmatrix} \sigma_{x_i} \\ \sigma_{y_i} \end{bmatrix}$$

As this research does not aim to study tendencies, we considered $\tau = 0$.

From these initial definitions, we considered some sets of randomized experiments with disturbance (coordinate changes) of each point in the network, called local experiments or simulations. For the purposes of this text, the terms disturbance, noise and point oscillation are used synonymously. The term simulation refers to the triangular irregular network whose points are being disturbed. Furthermore, from the experiments we sought to recognize whether there is and to what accuracy σ (*sigma*) the topology produced by the triangulation can be considered constant. With this, an algorithm was implemented to compare topologies of triangular irregular networks.

FIG. 1 Example of topology simulation of an triangular irregular network, triangulated by the Delaunay method, by changing points V1 and V4.

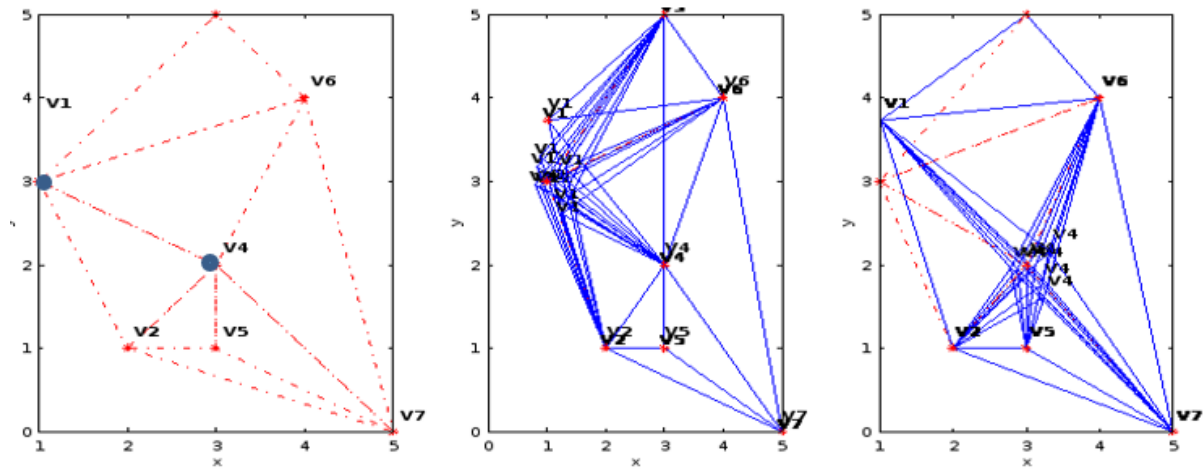


Figure 1 presents two simulation examples with constant topology. The first graph shows the original Delaunay Triangulation, in red; the second graph shows the disturbance at point 1 (V1), with the simulated triangulations in blue; and the third graph shows the disturbances at point 4 (V4), with the simulated triangulations also in blue.

The experiments were performed on a simulated network with 4 points and a lozenge configuration, in order to allow testing the methodology and the local behaviors for, in later stages of the research, applying it to triangular irregular networks with more vertices. Random mathematical experiments were performed using the Monte Carlo method.

For the simulation, at each point a noise was inserted k times, in such a way as to simulate the disturbance of the original point. The point disturbance was performed by generating noise according to the standardized normal distribution, which has mean zero and variance equal to 1, therefore:

$$z_i = \frac{x_i - \mu}{\sigma}$$

The formula was rewritten in x and y by:

$$z_{x_i} = \frac{x_i - x(\text{ponto})}{\sigma} \text{ e } z_{y_i} = \frac{y_i - y(\text{ponto})}{\sigma}$$

In the simulations it was done:

$$\sigma \cdot z = \hat{x} - x(\text{ponto}) \text{ e } \sigma \cdot z = \hat{y} - y(\text{ponto})$$

Therefore,

$$\hat{x}_i = (\sigma \cdot z_i) + x(\text{ponto}); \hat{y}_i = (\sigma \cdot z_i) + y(\text{ponto})$$

In which \hat{x}_i e \hat{y}_i are the new coordinates obtained by perturbing each original point and $i = 1, \dots, k$. For the generation of normally distributed pseudo-random numbers the Marsaglia and Tsang Ziggurat method was chosen, described in Marsaglia and Tsang, 2000.

Initially, oscillations were performed for each point in the network in an isolated manner. Each vertex was initially disturbed with $\sigma_{x_i} = \sigma_{y_i} = 1$, generically modeled on the form:

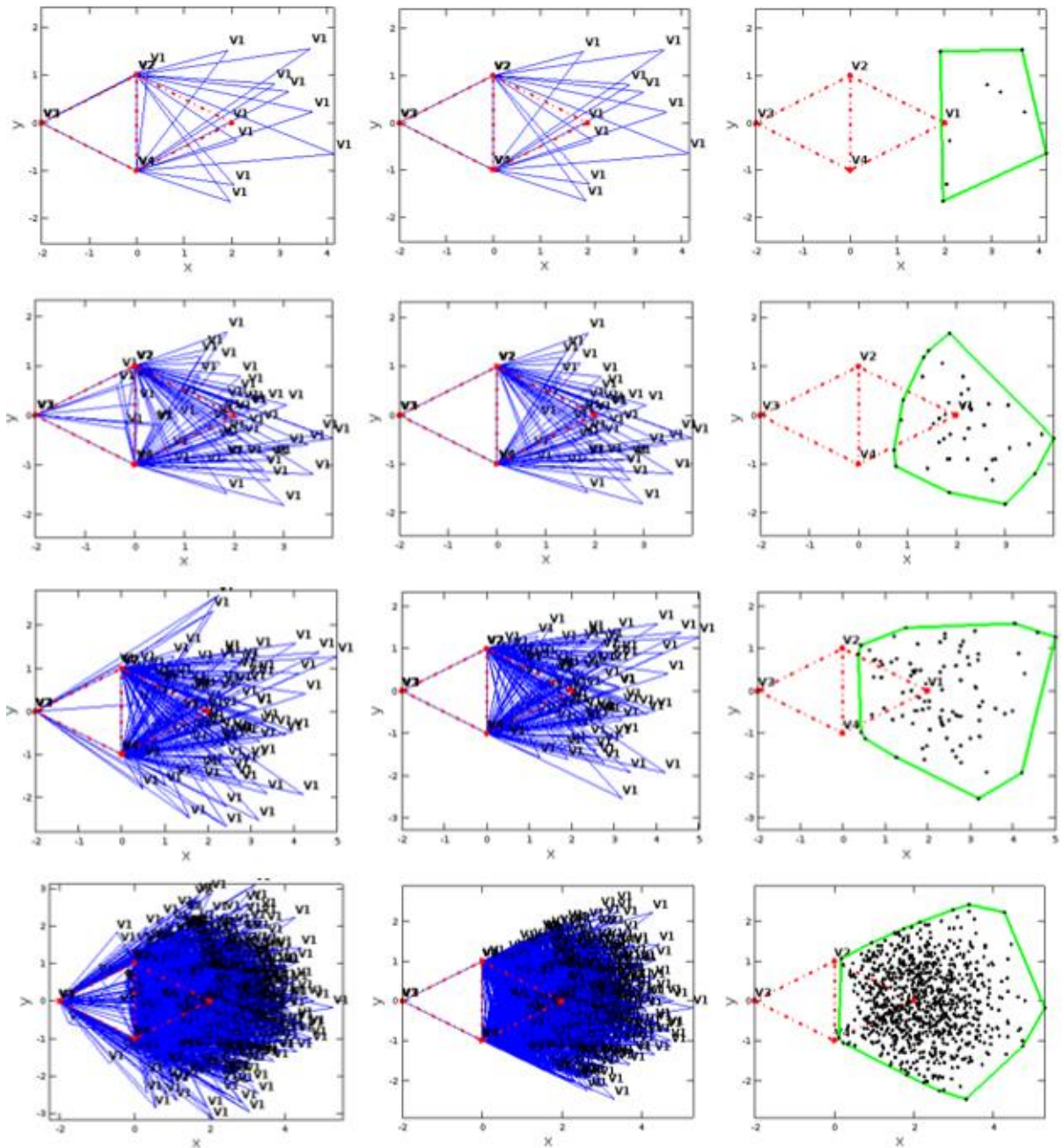
$$\hat{V}_i = \begin{bmatrix} x_i \pm \sigma_{x_i} \\ y_i \pm \sigma_{y_i} \end{bmatrix} = \begin{bmatrix} x_i \\ y_i \end{bmatrix} \pm \begin{bmatrix} \sigma_{x_i} \\ \sigma_{y_i} \end{bmatrix}$$

Then the simulation was performed on the network for varied σ . The first simulated network was composed of 4 points $V_i = \begin{bmatrix} x_i \\ y_i \end{bmatrix}$, forming a rhombus of coordinates $V_1 = \begin{bmatrix} x_1 \\ y_1 \end{bmatrix} = \begin{bmatrix} 2 \\ 0 \end{bmatrix}$, $V_2 = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$, $V_3 = \begin{bmatrix} -2 \\ 0 \end{bmatrix}$, $V_4 = \begin{bmatrix} 0 \\ -1 \end{bmatrix}$. This network was chosen initially because it is the smallest amount of points that allows for different triangulations during its disturbance. The choice in rhombus shape was motivated by being a simple geometry for the initial analyses.

4 RESULTS

The results of the Monte Carlo simulations are presented at each point in the network separately, followed by an analysis of the results. The figures show the simulations performed at point V_1 (figura 2 e figura 3) and in point V_2 (figura 4 e figura 5). All analyses concerning the points V_3 e V_4 are analogue, since they are symmetrical.

FIG. 1 Simulated experiments for $k = 10, 50, 100 \text{ e } 1000$, all with $\sigma = 1.0$.



The figure (FIG. 2) shows the representative figures of all simulated Delaunay Triangulations: (i) Without topology comparison, i.e., keeping the k disturbances referring to the original point 1. In it, the simulated triangulations are shown in blue; (ii) The triangulations with constant topology, i.e., $k_{TC} \leq k$, in which k_{TC} is the amount of disturbances with constant topology (TC), also in blue; and (iii) The resulting convex closure of the points with noise that allowed generating Delaunay Triangulations with the same topology as the original network, shown in green. Random experiments were performed for $k = 10, 50, 100 \text{ e } 1000$, presented each in a row with the 3 graphs described, initially with $\sigma = 1$. It has been shown necessary to

identify for other σ what is the behavior of the region through which point 1 can oscillate and yet remain with constant topology.

FIG. 2 Local convex closures of the disturbed point for simulations with $\sigma = 0.1, 0.3, 0.5$ and 1.0 ; each one with $k = 10, 100, 500, 1000$.

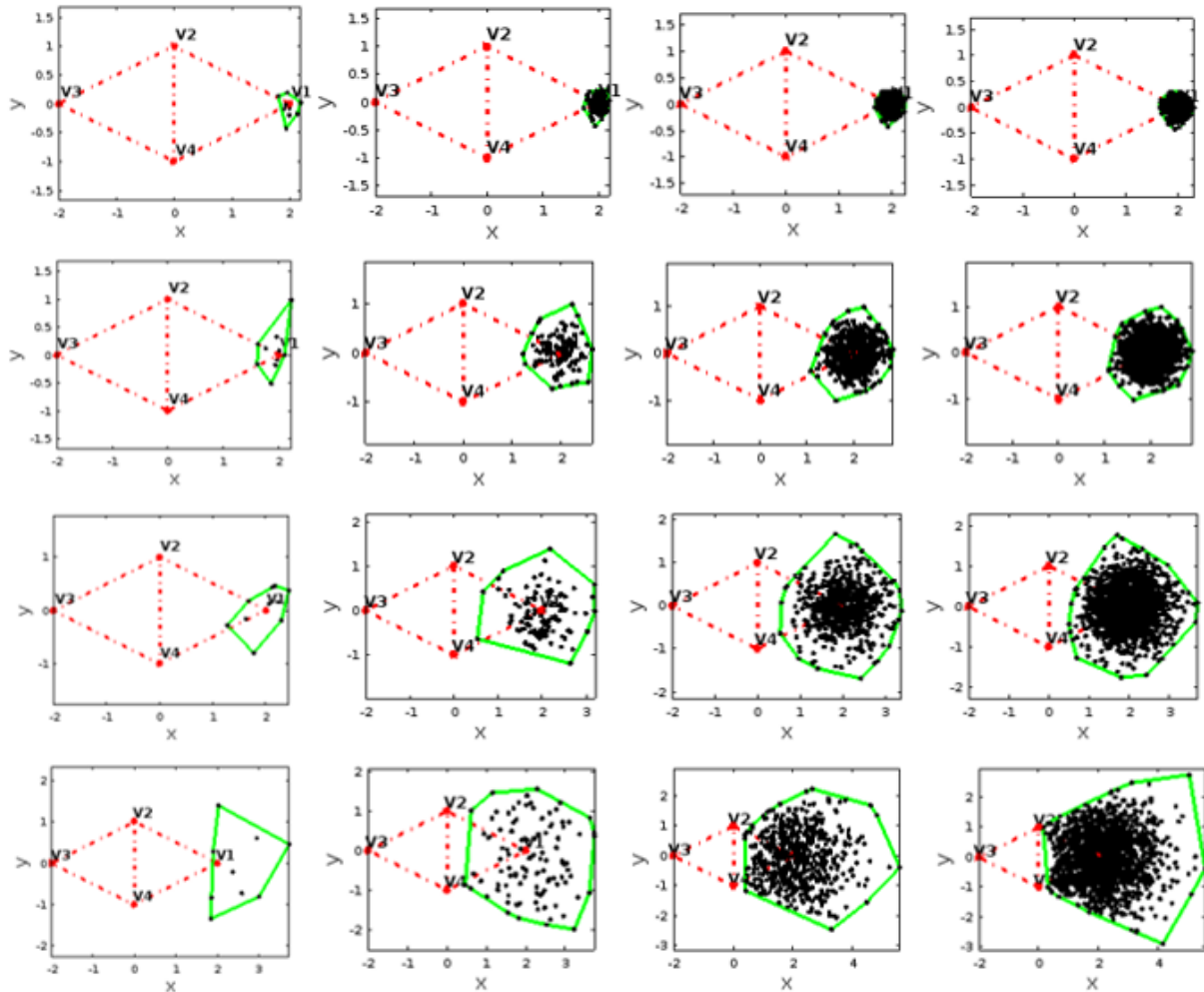
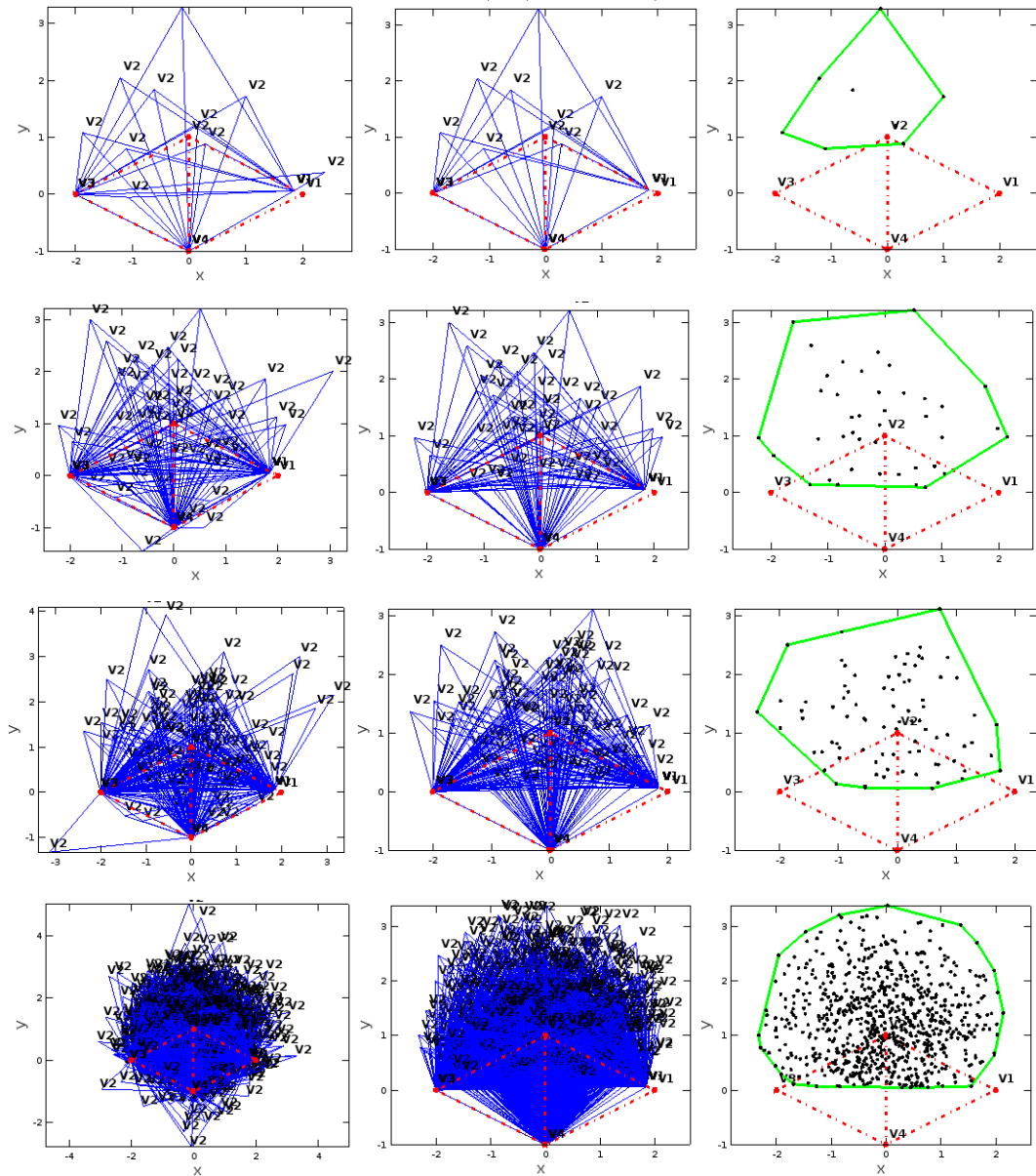


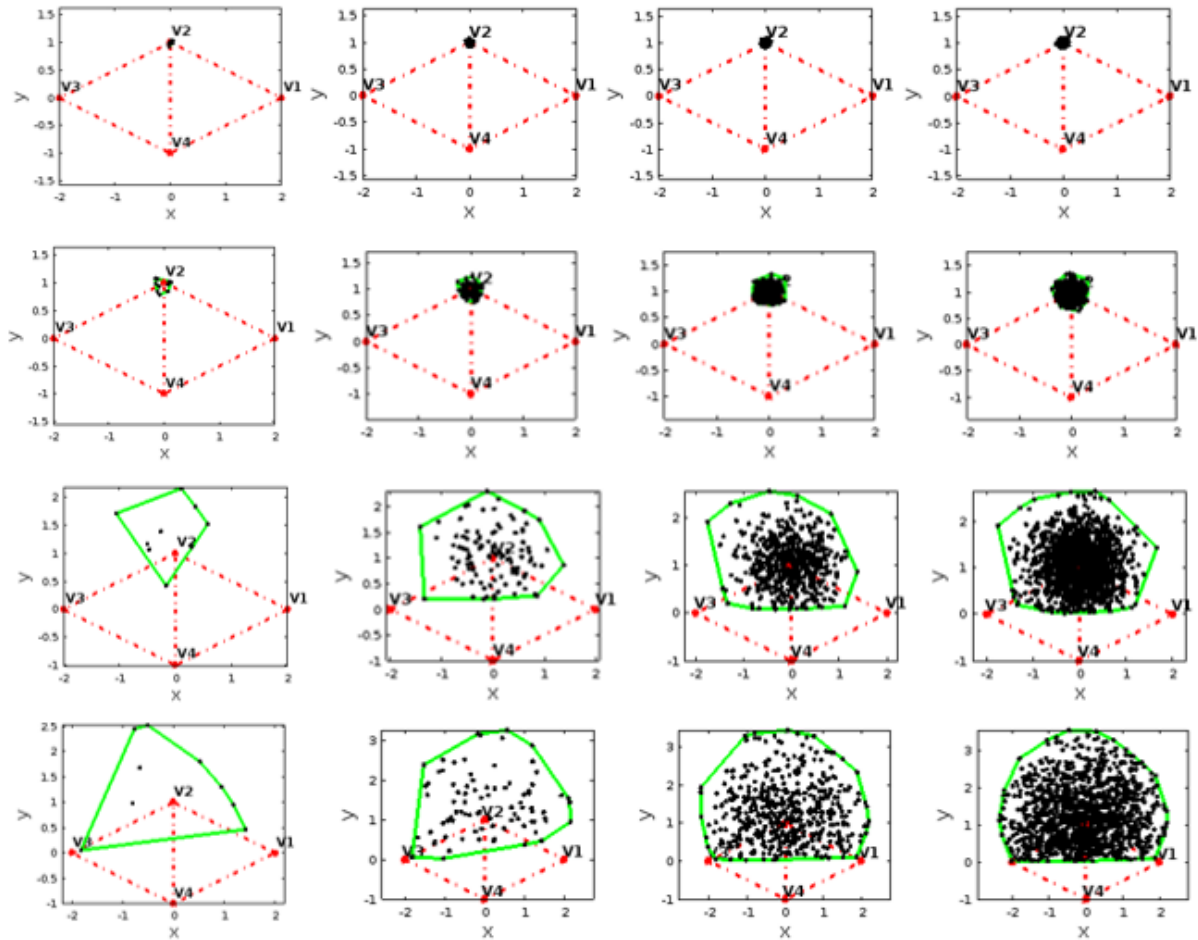
Figure 3 shows the points and convex closures that bound the constant topology region with different simulations, changing the value of σ to 0.1, 0.3, 0.5 e 1.0; each one with $k = 10, 100, 500, 1000$. In the figure are shown in each line $k = 10, 100, 500, 1000$ para $\sigma = 0.1$; $k = 10, 100, 500, 1000$ to $\sigma = 0.3$; and so forth.

FIG. 1 Simulations to $k = 10, 50, 100$ e 1000 , with $\sigma = 1.0$.



In the second simulation we performed disturbances at the point V_2 . As in vertex 1, experiments were carried out at point 2 with $k = 10, 50, 100$ e 1000 , with $\sigma = 1.0$. Afterwards (FIG. 1), experiments allow recognizing behavior patterns when σ is variable.

FIG. 2 Experiments for the convex closure of the points with simulations for $\sigma = 0.1, 0.3, 0.5$ e 1.0 ; each one with $k = 10, 100, 500, 1000$.



Likewise, in order to identify the pattern of behavior for various σ when the topology remains unchanged, simulations were performed for values of $\sigma = 0.1, 0.3, 0.5$, and 1.0 ; each experiment with perturbations $k = 10, 100, 500, 1000$. Figure 5 presents these results, such that to each row of graphs are shown all experiments of a given σ , with k in increasing order.

5 DISCUSSIONS

Monte Carlo simulation is used to solve the problem of identifying the existence of maximum σ for which the probability of constant topology occurring in the irregular triangular network is 100% after a new triangulation by Delaunay's method. The mathematical results gave origin to the following statements.

Consider a Triangular Irregular Network (TIN) generated from Delaunay Triangulation. If any point of coordinates (x_i, y_i) is disturbed (has its place changed), according to a Normal distribution $N(\mu, \sigma^2)$, then there is a value σ_{\max} (maximum sigma) to which the TIN topology will remain constant

Demonstration: To find the maximum sigma σ_{max} for which the topology remains constant, we performed thousands of disturbances at point 1 as follows: σ varying from 0.1 a 5 with intervals of 0.1; 0.01; 0.001; 0.0001; ...; 0.000001; according to Table 1.

TAB. 1 Simulation results with σ varying from 0.1 a 5 with intervals of 0.1; 0.01; 0.001; 0.0001; ...; 0.000001

Variation intervals of σ	Results of $\sigma_{max.1}$ to $P(TC = 1) = 1$	Results of $\sigma_{min.1}$ to $P(TC = 1) < 1$
0.1:0.01:0.5	$\sigma = 0.38000$	$\sigma = 0.39000$
0.1:0.001:0.5	$\sigma = 0.35100$	$\sigma = 0.35200$
0.1:0.0001:0.5	$\sigma = 0.30920$	$\sigma = 0.30930$
0.1:0.00001:0.5	$\sigma = 0.30866$	$\sigma = 0.30867$
0.1:0.000001:0.5	$\sigma = 0.30909$	$\sigma = 0.30909$

With this, it is verified that $\sigma_{max.1}$ of point 1 exists and is obtained by $\sigma_{max.1} = \min(\sigma_{max}) = 0.30866$. For point 2, in order to find $\sigma_{max.2}$ the simulations were performed as shown in Table 2.

TAB. 2 Simulation results with σ varying from 0.1 a 5 with intervals of 0.1; 0.01; 0.001; 0.0001; ...; 0.000001

Variation intervals of σ	Results of $\sigma_{max.2}$ to $P(TC = 1) = 1$	Results of $\sigma_{min.2}$ to $P(TC = 1) < 1$
0.1:0.1:0.5	$\sigma = 0.20000$	$\sigma = 0.30000$
0.1:0.01:0.5	$\sigma = 0.26000$	$\sigma = 0.27000$
0.1:0.001:0.5	$\sigma = 0.25700$	$\sigma = 0.25800$
0.1:0.0001:0.5	$\sigma = 0.25190$	$\sigma = 0.25200$
0.2:0.00001:0.5	$\sigma = 0.20240$	$\sigma = 0.20241$

With this, it was identified that $\sigma_{max.2} = 0.2$.

6 CONCLUSIONS

From the analysis of the simulated experiments performed using Monte Carlo Simulation, the following can be proposed regarding the maximum oscillation of the points in the Triangular Irregular Network.

Every Triangular Irregular Network (TIN) generated from two-dimensional Delaunay Triangulation has a value σ_* (sigma asterisk) for which the network topology will remain constant, obtained by:

$$\sigma_* = \min(\max\sigma_i) = \min(\sigma_{max.1}, \sigma_{max.2}, \dots, \sigma_{max.n})$$

Demonstration: Generalizing, making the worst case triangular irregular network as:
 $\sigma_* = \min(\sigma_{max.1}, \sigma_{max.2}) = \min(0.30866, 0.2) = 0.2$.

Note that, although the Monte Carlo method is computationally inefficient, being dependent on a large number of disturbances (changing the coordinates of the points) to obtain the probabilistic results, it proved to be adequate for this type of demonstrative research.

Finally, it is possible to conclude, for the simulated cases, that there is a maximum σ for each point of the irregular triangular network triangulated by the Delaunay criterion, as well as, there is a maximum σ for which the network as a whole remains with its topology constant. It is suggested that in future work, simulated experiments with multiple irregular triangular networks with multiple sizes be performed, in addition to simulations on real networks to prove (or not) the statements proposed in this paper.

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CHAPTER 9

CASE OF STUDY: THE WINDMILL OF EL PASICO: ALIVE CULTURAL HERITAGE

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ABSTRACT

The Campo of Cartagena counts on an excellent rural heritage not only for its monumental and landscaping values but also for its material and immaterial heritage. Of all of these monuments, the windmill of El Pasico highlights for its wonderful state of conservation, for being a symbol of its proud town and for being a cultural, touristic and leisure resource.

Keywords: Windmills, Rural Heritage, Campo de Cartagena, Industrial Heritage, Social Anthropology

1 INTRODUCTION

The geographical area of Campo of Cartagena was once densely populated by windmills which were used to grind cereals, salt and to get water from beneath the soil. Those machines became useless due to the sudden overcome of power and combustion engines: what was an essential tool in everyday life became a relic of older times. Their abandon has led them to ruin in most of the cases.

Just a few of them are still standing. This is thanks to public funds that subsidise the owners and public entities to recuperate them. Nevertheless, the immense majority of them are in an appalling state and dozens of them have already disappeared

However, the Asociación de Molinos de Torre-Pacheco, with the inevitable help of the Town Hall of this town, work in unison to maintain these buildings, its tradition and give them a use as a touristic asset.

Of all of these windmills, the case of the windmill of El Pasico is unique. This windmill is open to the public and is carefully maintained with its original structure, although some elements needed to be reincorporated due to their disappearance or bad state, especially parts of its wooden machinery.



Besides, it is frequently used as a touristic attraction very popular among the inhabitants of the town, people of nearby towns and holidaymakers from coastal and golf resorts.

Despite the phenomenal tangible and intangible heritage, the public institutions have not been able to promote its importance to the owners that have inherited them and see them as a nuisance in the middle of their extremely productive lands dedicated to a very valued intensive agriculture that export millions into EU countries (Luján Ortega, García Martínez, 2007).

What used to be a rural self-subsistence life has become a factory vegetable-maker way of production, thanks to the water coming from the canal Tajo-Segura which has transformed completely the economic intake but also the whole society and its customs. (Román Cervantes, 2004).

The recent meetings of experts in rural industrial heritage and the biannual organisation of Congreso Internacional de Molinología have given the windmills a new interest for the general public. As a good example of it, it can be mentioned the latest XII Congreso Internacional de Molinología that took place in Alcalá de Henares in November 2021.

2 THEORICAL FRAMEWORK

Just behind the city of Cartagena that counts on 152 windmills, it is the town of Torre-Pacheco that second with a higher number of these giants in their lands.

The town of Torre-Pacheco has a total of fourteen windmills; eight are for grinding cereals and six for water supply. All of them have been considered as elements under protection (Bien de Interés Cultural²) regardless of their state of conservation. All the windmills of Campo de Cartagena are included in the Red Book from the UNESCO dedicated to heritage endangered to extinction³.

The water supply from the canal of Tajo-Segura brought a profound agro-industrial change which led to even sharper economic and social changes (Martínez Menchón, Melchor Sennet 2007). Groups like

Asociación de los Molinos de Viento de Torre-Pacheco have promoted the protection and conservation of windmills as an industrial and cultural heritage (Sánchez Conesa, 2008).

The traditional agricultural practices have been overtaken by the new technologies and together with this, traditions and customs have been modified (Aguilar Rocha, Irving Samadhi, 2021). This leads to a change in the identity of the dwellers and due to this in the whole social structure of the society.

2) <http://www.patrimur.es/web/patrimonio-cultural/bienes-de-interes-cultural1>

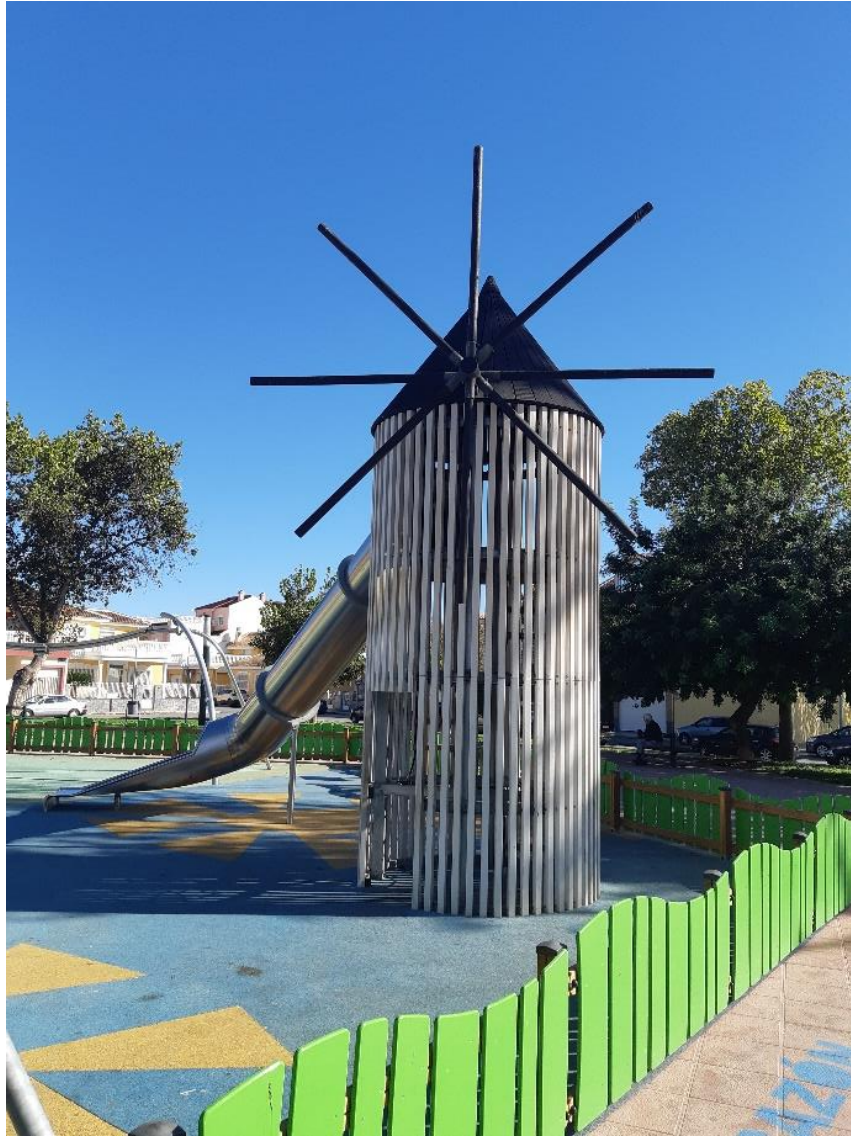
3) <https://listaropatririmonio.org/ficha/molinos-de-viento-del-campo-de-cartagena/>

Of all these windmills that inhabit the region, there is no other like the windmill of El Pasico. Being the only one that keeps its full wooden machinery, it still works as it used back in the XIX century. This windmill has become the most significant cultural symbol for the town of Torre-Pacheco.

The main characteristic of the windmills in Campo de Cartagena are their sails that have the same shape of a sail of a Latin sail boat.



Despite of other towns in the surrounding that have an important patrimonial heritage or are sited very near from the sea, the town of Torre-Pacheco have very little patrimonial assets to become a touristic town. This is the reason why the windmills have become for this town a key aspect of their idiosyncrasy. Most of its inhabitants feel proud of their windmills especially of those that are placed in the middle of the town. This interest for the windmills have made that they are present everywhere in the town. There is a playground for children in which the main attraction is a slide with the hape of a windmill.



Every road that leads to Torre-Pacheco shows a sign with a windmill painted on it. These are just two examples of how the presence of the windmills is mixed with the everyday tasks of these dwellers.



Most surely the windmill of El Pasico could be the only one that has a musical event annually. The wind orchestra, Union Musical de Torre-Pacheco, celebrates a concert in July, with great enthusiasm from public, since 2017.

This event is hugely celebrated in the whole town because the Town Hall provides all the elements to celebrate the concert at the same time that they provide the possibility to a theatrical visit with actors dressed up as millers. All this, while the windmill is grinding cereals, the tourist guide explains the history, society and functions of the windmill.

This event has been cancelled during the last two seasons due to the pandemic of Covid-19.



Although it was also cancelled during the pandemic, the Romería of San Miguel which is celebrated on the same date that the Fiesta de los Molinos, by the end of September is a means of promoting the windmills and the rural customs currently disappeared. These celebrations were created by the Asociación de Molinos de Torre-Pacheco. and it gathers a mixture of traditional food, music, clothing... a combination of tradition and heritage that is very welcome by the people present.

Also, it is important to highlight the case of the Dutch Kinderdijk⁷, which was declared by the UNESCO as World Heritage. This consists of nineteen windmills in perfect state of conservation that are the most important touristic attraction in The Netherlands. If this have been achieved there, it is an example to follow and consider that taking care of the local heritage is also a good means of promotion and business.

7) <https://www.kinderdijk.com/discover/the-story/>

3 METHODOLOGY

The methodology used for this piece of research is based on qualitative methods being the interview and the participant observation the most used ones.

Besides, the Town Hall of Torre-Pacheco promotes several events at the windmill which is also center of exhibitions for locals and foreigners interested in windmills.

On the one hand, Mr. Pepe Nieto, the miller, and the tourist guide from the town hall has given profound explanations of the functions of the windmill.

On the other hand, it has been possible to talk about the thoughts of the visitors to the windmill through informal conversations that are full of different opinions from local and foreigners.

Also, there are acts that occur every year as the Romería of San Miguel that takes place every 29th of September and these events have also been used to gather information.

This event is rather significant because it is not only centered in the windmill but also in traditional food including wine, desserts and ancient folk music.

It is worthy to remind that all these events were called off for two years due to the pandemic, Covid-19

4 CONCLUSIONS

1. - It is proposed to maintain and promote activities like the Fiesta de los Molinos and Romería de San Miguel which supposes a loudspeaker to raise consciousness about heritage protection, apart from empowering all the other activities attached to it such as popular games, popular dance and music, peasants' gastronomy, liturgical acts, etc.

2. - With no doubt, the most remarkable act due to the fact that it is unique, is the music festival celebrated yearly. It is proposed to continue with its celebration which carries a great assistance of public, visits to the windmill and awareness about the past cultural heritage, as well as the nowadays and past music culture.

3. - It is proposed to study the phenomenon of Kinderdijk⁸ in Holland that has made that a group of windmills has become one of the most important touristic spaces not only in Netherlands but in the whole European continent. For this, the recovery of all the windmills should be an essential must for politicians and owners.

4.- It would be advisable to study the industrial use of these constructions for those persons who aim to go back to a more natural life. However, this can only be done after the approval of the Food Security authorities.

5. It is proposed to work on the possibility to use the monument as a rural hotel for short stay that it is estimated that it would become of great interest for locals and visitors to the nearby coastal towns

8)<https://www.holland.com/global/tourism/destinations/provinces/south-holland/the-windmills-os://www.kinderdijk.com/discover/the-story/>

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CHAPTER 10

Burnout Syndrome in Sports

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ABSTRACT

Through cataloged data from studies already carried out, it was seen that Burnout has a set of symptoms for the syndrome. Those are assessed in three dimensions for its diagnosis within the labor and sporting scope. Therefore, it was visualized in the studies by Gustafsson that among 980 athletes from 58 different modalities, a considered part of them suffered with levels below the moderate of symptoms of the Burnout Syndrome. According to Goodger, 73 percent of the studies collected were from women who showed high levels of anxiety, tension and stress. It was also noted that part of the characteristics of Burnout Syndrome are physical and psychological problems that influence the physiology and may even develop symptoms of overtraining syndrome, preventing athletes from performing their potential in certain competitions or not progressing accordingly in training.

Keywords: Burnout, Physical Education, Psychology, Sport.

1 INTRODUCTION

The importance of physical activity to promote both physical and mental health has been well emphasized in researches (Vilela & Gomes, 2015). Unfortunately, in some situations and in some cases the sport practice professional athletes can go through major episodes of stress and frustration that can cause

defeats and even, in more serious cases, drive them away from the sport that is practiced (Turner & Jones, 2014).

According to Giglio & Rubio (2013), throughout the career of professional athletes it may occur that the professional or professionals, suffer influence in several ways, either by the media or even by the interests of their fans. There are those athletes who manage to live well a condition of being treated as celebrities and kept in evidence for longer, however, they are exceptions to the rule, since the vast majority cannot deal with this type of exposure. It is known that in the current high performance practice, an athlete's success can be defined from the public support, participations and mentions in sport programs and in reports that the media makes both on TV and social networks.

All the aforementioned factors influence the life of a professional athlete, regardless of the sport he or she practices, leading to possible millionaire contracts, which will cause great professional demands, stresses and charges in their lives. The stress caused by the media exposure, the overload during the daily work routine, the external demands and other factors cause an athlete to reach professional exhaustion (Giglio & Rubio, 2013).

For Oliveira et al. (2021), then arises a term Exhaustion Syndrome that comes from the psychology of work, which began to be inserted in the mentioned area, which is the *Burnout* Syndrome (BS). Although it is considered in the literature as a concept that is relatively new, its studies emerged, therefore, in the mid-1970s, but for psychology it is a subject that has been debated for a long time.

In general, the first author to mention BS in the sphere of general psychology was Freudenberg (1974; 1975), he was responsible for defining this syndrome as an exhaustion that comes from the excess demands of energy, strength or resources. The author also states that when working in a community clinic responsible for providing voluntary services to people who were in a condition of social risk, one realized that *Burnout's* state of exhaustion could be identified and discussed by the workers of the area. Due to the responsibility of meeting all the needs of people, a greater pressure and involvement arose that needed to be well managed so that both the professional and the volunteer would not be affected by *Burnout*.

Although the literature states that Freudenberg (1974; 1975), to this day, is considered to be the precursor of the scientific literature on *Burnout*, Maslach & Jackson (1981) are considered to be the protagonists of the first studies, as they were responsible for conceptualizing BS as a syndrome responsible for causing a process of both emotional exhaustion and cynicism, often occurring in individuals who perform certain work for other people. Subsequently, the authors developed a specific questionnaire for this syndrome, validating it as a measurement instrument, being called *Maslach Burnout Inventory* (MBI), used until today to measure levels of *Burnout*. After performing a factor analysis, the authors were responsible for finding three dimensions or, also, denominated as being subscales responsible for explaining what is *Burnout*, considering emotional exhaustion, personal accomplishment and depersonalization.

Therefore, according to the definition of Maslach & Jackson (1981), one can define BS as being a reaction to the process of emotional tension, considered as a consequence of an excessive and direct contact

with other people. Thus, the worker was worn out in such a strenuous way that he/she gave up or could no longer stand such tensions, going into *Burnout*. The authors also point out that this syndrome could be considered by means of a multidimensional evaluation as previously mentioned, causing the worker to lose involvement with the activities he/she performs.

Therefore, in general terms, *Burnout* can be defined as a significant loss of energy or complete burnout. Therefore, this is considered a syndrome in which the individual has lost the sense for the realization of things around him, nothing else matters, where any effort he makes, becomes useless.

Regarding the concepts, one can address conceptions that are more prominent in the literature regarding BS. Initially, the definition of Farber (1991) is highlighted, mentioning that BS can be considered as a work-related syndrome, originating in the discrepancy between the individual perception and between the effort and the consequence, a perception that can be influenced by several factors, individual, social and organizational.

In both the national and international literature, there are several concepts related to BS. Although these concepts are differentiated, depending basically on the authors, when analyzing them all, there is a consensus among them that this syndrome is considered a response to a daily stressor and an overload that is imposed on the individual. Several areas are affected by BS, including the educational and health areas, as a result of the impossibilities of the tasks that are required from these professionals, the great demands that are imposed on them and how much they are charged, which gradually make individuals come to collapse and thus develop this syndrome (Codo & Vasques-Menezes, 1999).

In the high performance or professional sports scenario, BS can be defined as a psychosocial syndrome which is responsible for involving feelings of emotional and physical exhaustion, devaluation of the sports practice and a low sense to perform a task (Gustafsson et al., 2008).

Seeing these symptoms and that high performance sports is framed as work, the athletes are at risk of developing BS. Freudenberg (1974/1975), makes it clear that what fits to be part of *Burnout* is to be within a labor context, i.e., to work and be working.

For this reason, BS is a phenomenon that may affect athletes, members of the technical committee, coaches and other players involved in the sport. However, its identification needs further investigation by the scientific and sports community, since knowing how to identify and distinguish BS in just one bad moment in an athlete's career is still complex, since BS is a process that is increasingly more present in the sports environment than one can imagine.

Thus, this work has the following guiding question: How does BS impact the career of high performance athletes and members of technical committees?

To answer this question, the general objective of this work is to investigate through literature how the establishment of BS and its consequences for athletes occurs.

2 METHODOLOGY

This research is configured as a narrative review in which it is supported by the exposure of ideas and points of view based on the bibliographic reference that relates to a given topic. According to Rother (2007), narrative review articles are appropriate publications to describe and discuss the development of a given topic, considering the theoretical and/or conceptual point of view.

Thus, the texts addressed constitute an analysis of scientific literature, interpretation and critical analysis of the author. It is important to consider that, despite its scientific evidence being considered lower than other types of reviews due to the impossibility of reproducing its methodological path, narrative reviews bring the possibility of contributing to the debate on certain issues, pointing out issues to be raised and collaborating in the production and updating of the literature (ROTHER, 2007).

The process of collecting the material presented in this study occurred in a non-systematic manner, using the scientific databases Scielo and Google Acadêmico with the following descriptors: "Burnout Syndrome in Sports" and "Burnout Syndrome in Athletes". The materials were read in their entirety, grouped into categories and critically analyzed.

3 BIBLIOGRAPHIC REVIEW

3.1 BURNOUT SYNDROME: THEORETICAL CONCEPTS

In the area of sport, BS may be defined as a condition that causes physical and emotional exhaustion, which is associated with intense demands of training and competitions, as well as symptoms that vary from person to person. The author Raedeke (1997) presents and explains that BS may be considered, through the dimensions of "emotional and physical exhaustion", capable of "reducing the sense of accomplishment of the sports practice" and, consequently, a "sports devaluation".

According to this definition, burnout is a syndrome, that is, a set of symptoms, and is based on three dimensions: emotional exhaustion (characterized by feelings of extreme fatigue); depersonalization (negative feelings towards clients, illustrated by impersonal, disconnected and careless behavior towards them) and, finally, reduced job satisfaction (negative evaluations about oneself, particularly with reference to the ability to succeed in working with clients) (RAEDEKE 1997, p. 397).

Exhaustion of physical and emotional capacities is understood as an association of intense demands of training and competitions that cause reactions such as anxieties, tensions and stresses that will cause high levels of physical and psychological fatigue. With regard to reducing the sense of accomplishment of the sport practice, as being a dissatisfaction that is related to a sport ability and skill that may be defined by a lack of progression in athletic performance and perceptions about the lack of success and the absence of a particular talent, finally with regard to sports devaluation, it may be considered that it is an association with a negative and indifferent attitude by means of some important event in a given domain manifested mainly by the occurrence of lack of desire, lack of interest and absence of caring about the sporting activity (Raedek & Smith, 2001).

According to Oliveira et al. (2021), one of the main symptoms of BS during its initial phase is a vertiginous drop in performance, which is a sign that the athlete is affected by this syndrome and, this worsens even more with pressure on the athlete. In many cases, the athlete needs to win in order to continue to compete and to make correct plays to acquire confidence. However, the impossibility of accomplishing it, only causes an increase of tensions, where the results considered positive do not appear and his/her performance starts to fall, his/her trainings start to be demotivated and BS is installed. Such situation begins to repeat itself in a rampant manner and, as a final result, the complete giving up occurs. In addition, an extremely relevant factor is the identity loss, an important alteration that has a direct relationship with the athlete's involvement (Vissoci, et. al., 2020).

In this sense, it is essential that professionals working in Physical Education and sports in general know how to deal with BS, being able to identify and develop prophylactic measures throughout their activities. Therefore, the distinction of this syndrome from other problems that may affect the professional life of a sportsperson should be considered as an important factor to the main skills of Physical Educators who work with high performance athletes (Oliveira et al., 2021).

In his literature review, the author Oliveira et al. (2021) concluded that there are several factors that can cause exhaustion in an athlete and, subsequently, cause the withdrawal from practicing a certain modality, such as overtraining, *overreaching*, and fatigue, among others. However, all these phenomena should not be confused with BS, which is an event that occurs after these phenomena. Therefore, the authors mention that there is a confusion in the literature of concepts and definitions regarding these phenomena and, however, it is necessary to note where each one of them arose in order to differentiate them, taking care with the idea that everything that is occurring with an athlete will be considered *Burnout*, because some athletes who leave the sports practice, who no longer have it as the objective of their lives and start to perform another activity, this event does not represent BS.

Another preponderant factor in an athlete's career is external pressures. The demands of winning, excessive demands by parents or coaches, comparisons between family members or even those made with technically better athletes in the same group, and the demands of performing a certain modality with exquisite perfection all contribute to the emergence of BS.

The consequence is that the athlete ceases to exercise his profession for pleasure, where the game is characterized in the search of a victory and the winning must occur at any cost. In addition, sport managers and technical committees, in their majority, only have eyes for the victory and forget that the athlete is and should also be treated as a human being, who may be affected by psychic, physical and even emotional variables, and with this, they end up forgetting the pleasure, that same one, in a day, was one of the responsible factors for making them start in the sport practice. In sport, the importance given to a competition overrides any need (Benevides-Pereira, 2002).

All this overvaluation related to victory can be linked to another event that is referred to overtraining. According to the authors Jones and Hardy (1990), a competitive performance is basically

dependent on the association of three factors which are the technical, physiological and psychological. Regarding psychological factors, stress is considered as one of the most important and, several times, it is responsible for determining a success in relation to sport performance.

Jones and Hardy (1990) say that sport training that is carried out continuously causes stimuli considered as being permanent, promoting successive adaptations of psycho-physiological nature in the athlete's organism. All these adaptations are considered as positive, i.e., they are able to strengthen the physical and psychological body to face the demands that in turn end up being even more rigorous.

However, physical stress in excess produces consequences that are not always positive, and may cause overtraining that, according to Gould et al. (1997), may be considered as a precursor to the origin of BS.

This excessive training load and the excessive competitions can also harm the social part of the athlete. Due to the high demand, he has no time to enjoy his family, friends or any other activities that can provide him pleasure and, it is implied, especially in athletes with less age, because their childhood will end even earlier, due to the enormous accumulation of responsibility that, in most cases, the athlete is not yet fully prepared to face these challenges. Thus, he ends up entering in a process known as *Burnout*, where there is the desire to have a "normal life", that is, to do what his friends of the same age do. Therefore, it is mentioned that professionals should let children get involved from activities outside the competition and training environments. They should let the children be children. By no means a young athlete can be confused with the young athlete (Gould et al., 1997).

All these analyses were important to combat the process of early specialization in sporting activities. This is common to observe in younger athletes that are subjected to great loads of trainings more and more specialized that aim only at results and accomplishment of immediate objectives. According to Paes (1992), the whole process of an increasingly precocious specialization needs to be postponed, because it becomes something harmful for the development in a harmonic way, with respect to learning the sport techniques, besides the moral values, where such importance needs to be worked and, mainly, stimulated with the students. The process of earlier and earlier specialization may be considered as being only one more of the several factors that are correlated to the unleashing of *Burnout*, leading the athlete to give up the sport earlier and earlier. This is because, the earlier this specialization occurs, the worse the consequences will be because young people end up leaving the sport modalities early due to the demands imposed on them.

A recent study suggests that both age and gender did not show any difference in the development of BS. However, according to the same author (Rodrigues, et al., 2021) athletes practicing individual sports, BS is even higher when compared to those who practice collective sports. For Smith (1986), this fact occurs due to the fact that they are more competitive, which allows them to have a greater physical and psychological demand due to its repetitive and monotonous nature and with less social support during training. However, according to De Rose (2001), in a study about the stress of adolescents in the modalities of basketball, soccer, swimming and tennis, it was observed that the female athletes had higher significant

levels of stress in comparison with the male athletes. Still in relation to the mentioned study, among all the sportive modalities that were studied, it is considered that tennis was the one that presented a high level of stress when compared to the others due to being an individual sport with enormous pressure.

3.2 *BURNOUT* SYNDROME: INSTRUMENTS TO ANALYZE BS

As regards the inventories to analyze BS in athletes, Silvério (1995) was responsible for developing the *Burnout* Inventory for Athletes (IBA), being responsible for investigating six factors that in the author's view are considered the main ones to evaluate the exhaustion of athletes, which are discouragement, absence of energy, expectations of inefficiency, the amount of exhaustion, lack of interest in the sport practice and excitability. This is an inventory, formed by 27 questions, which are answered by means of a Likert type scale with five alternatives that vary from "totally disagree" to "totally agree". The author states that it is very important to have inventories to measure and assess the state of BS development in athletes and that it should not be based only on common sense, but rather, to seek concrete, safe and reliable information through science.

In addition to the aforementioned inventory, it may be mentioned that in the sports sphere, the most used instrument to measure *Burnout* is the *Athlete Burnout Questionnaire* (ABQ) (Raedeke & Smith, 2001). This inventory consists of 15 questions that are responsible for assessing the frequency of feelings that are related to the syndrome. In each item, it refers to one of the following three dimensions of *Burnout* in athletes, which are physical and emotional exhaustion, reduction in the sense of accomplishment of the sport practice and sport devaluation (RAEDEKE, 1997).

In this questionnaire, the answers are provided based on the Likert type scale, with five points, ranging from 1- "almost never"; 2- "rarely"; 3- "sometimes"; 4- "often"; and 5- "almost always". Regarding the results, they are measured from an arithmetic mean of the answers that were given for the five criteria that correspond to each dimension. The total *Burnout score* is given by the average of all fifteen items present in the inventory. The interpretation of the scores must be performed from the variation of the frequency related to the feelings, that is, if the athlete has an average of 2.8 in the dimension of sport devaluation, it may be considered that this athlete has feelings related in this subscale with a frequency from "rarely" to "sometimes" (Raedeke & Smith, 2001)

The whole process of identifying such syndrome cannot be performed only by psychological instruments. It is recommended that the direct contact with the coaches and other professionals of the technical committees who experience the day to day of the trainings also provide evidence of the occurrence of BS. To be able to make such a finding, it is necessary that the professional in question has knowledge about what the BS is, how it is established and how it develops. However, it is necessary to mention a caveat in the sense that there is a lack of literature on studies on the subject, therefore, it becomes more complicated to present which are the characteristic signs and symptoms of such syndrome. Therefore, the biochemical measurements are considered as indirect demonstrators of the factors responsible for limiting

the sports training, as is the case of overtraining, which may result in the occurrence of BS. Authors Weinberg and Gould (2001) consider as emotional symptoms of BS loss of interest and absence of desire to play, mental exhaustion, absence of concern, symptoms of anxiety, depression, stress, fear, among others. Thus, several strategies need to be used to prevent or reduce the likelihood of the onset of BS.

3.3 CAUSES AND CONSEQUENCES OF *BURNOUT* SYNDROME

Verkhoshanski (2001), a scholar in the field, in the early 1990's, pointed out some aspects of that moment of sport development, implying in problems and challenges that may be overcome, thus giving rise to new understandings on the preparation process, culminating in procedures supported in a precision of technological follow-ups and in methods of high demand. The author listed five requirements. The first of them is related to a constant increase in the levels of the sportive results, forcing the athletes and technicians to have the capacity of exploring more and more the limits of the performance of high level of demand, what will reflect in a methodological-organizational process. The second one is related with a tension that is promoted from the obtaining of results and an increase in the amount of athletes that need to obtain results of very high level, what is responsible for promoting increases regarding quality, stability and performance in technical and tactical aspects, as well as in the inter and intrapersonal capacities. The third question is related to a difficulty in making a progression in the intensity levels of the preparations, which demands a constant exploration in the items that can mean an increase in the effectiveness of the special physical training. The fourth one is related to the constant increase of training volumes, which promotes the appearance of problems related to the investigation of the relations considered to be the most effective among the loads of the most different orientations of the special physiology and in the combinations of cycles related to the loads preparation, among others. Finally, the fifth requirement is the importance that must be given to the science of processes related to training due to the high levels of demand that are recommended in training and, later, in competitions, which must have a high level of quality for the performance of its participants. The athletes started to be demanded in their functional systems with enormous relevance what needs scientific knowledge (Verkhoshanski, 2001).

The causes of *Burnout* are related, in particular, to relationship difficulties with the coaching staff and/or coaches, with the greater competitive demands, with the monotony of training, with the absence of sporting skills, with the feeling of disappointment of initial expectations with the final results that were obtained, with financial interests, be of the entrepreneurs or even of the parents, with the absence or in the reduction of the personal life out of the sport, with the absence of family support or friends, in the excessive demands of energy and time, with isolation feeling by means of the technical team and, finally, with the lack of positive efforts in the obtained results (Garcés de Los Fayos & Vives, 2002).

On the other hand, the consequences of such a syndrome reach the physical dimensions, causing reductions in energy levels and an increase in susceptibility to illnesses and sleep-related disorders, with the behavioural dimension that gives rise to feelings of depression, anger and abandonment (Smith, 1986)

and, finally, with the cognitive dimension that promotes perceptions of overload, abandonment and low achievement in the face of boredom (Fender, 1989).

Burnout is not a syndrome that affects only athletes, but also members of technical committees. In a study conducted by Weiberg and Gould (2001), they reported that the syndrome in members of technical committees and technicians involved in professional sports modalities, as well as academy teachers, administrators and physical education teachers, are affected.

Weinberg and Gould (2001) consider as the main stressors for professionals the differences between genders, the pressures that are imposed to win, parental and/or administrative interference or indifference, indiscipline problems, responsibility in developing multiple roles within the training of an athlete, travel commitments, intense personal involvement, differences related to age, experience, training styles, social support, among others.

As far as professional athletes are concerned, external pressures are also important for determining their lives. The demands for victories, whether from parents or coaches, comparisons with siblings or better players in the group, and demands regarding perfection are factors that can contribute to the emergence of stress and what used to be a passion becomes a nightmare due to psychological discomforts (Caruzzo et. al. 2020).

In this sense, athletes stop playing for the simple pleasure of competing and seeking victory. Winning starts to have a connotation of obligation, i.e., it becomes necessary to win at any and all costs. Along the search for the causers of the pressures regarding the athlete, it is common to find in the literature culprits in a direct way. Such condition is installed in a common sense that the sport managers and technical committees demand from the athletes only the victory and disregard what may cause physical and psychological disturbances in the athletes, forgetting, thus, the pleasure that is to accomplish the trainings and to participate in the competitions that one day were responsible for initiating the sport practice.

The importance of the competitions and of the victories stand out to the needs of obtaining the pleasure that is the practice of sport, then, it can be observed, also, the media as a great influencer, because at times it makes an athlete idol and, when the same is in a bad phase, fails or causes the loss of an important competition, the media disappears, no longer considering it as useful, starting to ignore its existence. In other words, in sport, one day you have basically everything, invitation to events, high fees, television programs, exposure on the Internet and, the next, the athlete no longer has any of this, being simply forgotten (Oliveira et al., 2021).

Apart from that, it can be observed that excessive training loads and, consequently, of competitions, are also important in the sense of coming to cause damages to the social part of the life of an athlete. This, because due to the commitments that the athlete has with his professional life, he no longer has his social conviviality or time to perform satisfactory activities, which cause him pleasure (Oliveira et al., 2021).

The act of losing the social life, especially for the youngest athletes, implies in a process of reduction of childhood and youth, accumulating a responsibility that in most of the times, they cannot deal with

certain subjects that effectively belong to the individuals who are adults. In this context, this fact is determined as one of the causes for the occurrence of *Burnout* (Oliviera et al., 2021).

For the author Smith (1986), *Burnout*, needs to be considered responsible for involving an escape, be it in the psychological or emotional sphere and, in some cases, physical, due to pleasurable acts as a form of responding to the excessive level of stress or dissatisfaction. It is known that the absence of pleasure and the valorization of their performance are for the athletes the primordial alterations presented, are the responsible for causing prolonged periods of stress, leading, in many cases, to the exhaustion of the athlete (Gould et al., 1997).

In the sport considered as professional or high performance, excellence is always sought as a fundamental piece to obtain success. Thus, the occurrence of diseases that may delay or interrupt the professional life of high performance athletes is not allowed, as it needs to be healthy and long lasting. Attention must also be directed to people who practice a given sport as a way of avoiding a sedentary life, given that they cannot be run over by these ills while they seek a better quality of life for their daily lives (Gould et al. 1997).

The process of overvaluing the victories may cause another event, an over training, as alerted by the authors Jones and Hardy (1990). Competitive performances depend basically on the combination of technical, physiological and psychological factors. One may mention that among the psychological factors, stress is considered to be one of the most important and, several times, it is responsible for determining the success or failure of the performance. The sportive training that is accomplished in a continuous way, causes permanent stimuli, promoting successive psycho-physiological adaptations in the individuals' organisms, where such adaptations are considered as positive, because they are responsible for strengthening the organism physically and psychologically so that it can face the demands that are increasingly considered as being rigorous.

Therefore, the BS that is present in the world of sports must already be considered as one of the factors responsible for limiting the development of athletes, especially the youngest ones. It is very common for athletes who reach the professional level to give up the sport practice, abandon their careers for not being able to withstand the excessive pressure and the very high level of demand. If they do not have psychological accompaniment, they will not be able to "survive" in the sporting world (Gould et al., 1997).

The relationship between stimuli, reactions and all the adaptations of the organism are represented by stress. However, excessive physical stress has its consequences, which are not always considered positive. The excess of physical stress can cause overtraining. According to Gould et al. (1997), it can be considered as a precursor of BS.

According to Hellstedt (1995, p: 117),

The interferences social inter-relationships are also fundamental aspects for the establishment of an environment in favorable conditions for the process of formation of the athlete. For it is at home that the youngster develops his identity and this will reflect in his sport career. The successful career of an athlete can reflect of the conduct of the family towards this, the encouragement of the family, acquisition of values, besides the love and support necessary during the whole career.

Besides the aforementioned factors, the family can also have interferences, unfortunately, negative for a career of certain athletes, because the family bosom that would be responsible for all the support, becomes the center of demands, charges and comparisons considered quite unnecessary that are capable of causing expectations that are unrealistic and frustrate the athletes. Therefore, *Burnout* in athletes is a process that originates more markedly through the incompatibility of their plans and their initial goals with the sport modality. Due to the chronic socio-psychophysical demands that sport requires, one of the most striking characteristics that can occur is the abandonment of the sport modality (Oliveira et al., 2021).

3.4 MAIN THEORETICAL MODELS OF BS THAT ARE USED IN SPORT

In order to help explain the *Burnout* phenomenon, there are some theoretical explanatory models aimed at explaining this syndrome, which help to understand how this syndrome developed in people and, knowing how this process occurs, one can think of ways to combat and prevent it (Chiminazzo & Montagner, 2004).

The first model addressed was proposed by Smith (1986, p. 37), known as the Cognitive-Affective model. For the author, *Burnout* is considered to be "a reaction to chronic stress". According to the author's point of view, this syndrome is responsible for having physical, mental and behavioral components, presented from a remarkable characteristic that is the psychological, emotional and, several times, physical saturation of an activity that was previously sought after and very pleasant and with time ceased to be so.

Based on this model, in cases in which the athlete can no longer continue in the modality and leaves it due to interests in other activities of social nature or even in another sport, it is not configured as being a *Burnout*. In the occurrence of such syndrome, there is an elevation in the stress that is caused by training and competitions. As rewards, one can mention the satisfaction, the achievement of goals, the social prestige and the financial gains promoted by the sport remain at the same level, the athletes make the option to interrupt the sports and competitive career to pursue other activities (Smith, 1986).

In the theory of the Cognitive-Affective model proposed by Smith, there are some stages. The first stage is related to the situational demands, that is, the high demands that are imposed on the athletes, such as great training loads or even enormous pressure to achieve victory in a certain match and/or competition. When such demands of a certain situation have the capacity to overcome the potential resources, the stress phenomenon occurs. In the second stage, cognitive evaluation, individuals are responsible for evaluating and interpreting the situations in which they are inserted. The third stage, investigates the physiological

responses that appear according to the stress found in a situation that may be harmful or threatening, which may cause the athlete to increase tension levels, developing greater irritability and fatigue. Finally, in the fourth and last stage, the physiological responses appear according to the stress verified in a situation that is considered as harmful or threatening, which may cause some alteration in the behavior of control and of the task, with a reduced performance, having difficulty in the interpersonal relationships and eventual retraining of the activities (Weinberg; Gould, 2001).

On the other hand, the theoretical model of Coakley (1992) is responsible for having an essentially social perspective. In this *Burnout* originates because it is a consequence of a social structure responsible for associating an identity and dimension of the athlete's "I", directed solely and exclusively to the sport modality he/she exercises. Therefore, only by acquiring new experiences and life experiences, will the athlete be able to prevent or even reverse the *Burnout* condition. For this fact to really happen, a huge transformation along the sport social scenario is required. Literature considers that this model is of a more sociological nature.

The author Coackley (1992) argues that the *Burnout* process can be described as a simple tuning and that its cause, especially in athletes of younger ages, is directly related to the social organizational structure of high performance sport and its effects regarding questions about the process of identity and control. Still according to the author's reflection, this syndrome occurs due to the structure of sports that are highly competitive, which does not allow young athletes to develop an identity considered as normal, and thus, they cannot spend enough time with their peers outside the competitive environment. In the present study, the author also reports that the prevention of this syndrome would be to have the ability to increase a power of the young athletes, so that it can eliminate the two dependencies.

Finally, another model elaborated to explain the *Burnout* phenomenon is the Model of Negative Stress Responses to Training, which was constituted by Silva with the intent of promoting explanations regarding the *Burnout* phenomenon, focusing more on responses to physical training, although they recognize the importance of psychological factors. According to the author of this theory, *Burnout* may be defined as a psychophysiological response to exhaustion that comes to be displayed as the result of frequent efforts that are sometimes considered extreme, but in general are ineffective in dealing with the excessive training of high performance and the demands of a given competition (Silva, 1990).

Along this theory, the author Silva (1990), suggests that the physical training is one of the factors responsible for stressing the professional athletes in a physical and psychological way, which may cause both positive and negative effects. The positive effects are those that are frequently observed in the trainings as the improvement of the physical part, of the abilities, among others, being desirable results of a training process. On the other hand, excessive training can be harmful because it develops a negative adaptation response, resulting in overtraining, which can cause *Burnout* as a final product.

According to Paes (2002, p. 96), "at school or out of it, sport for children and youngsters must be proposed in the educational context". Thus, this becomes the greatest concern of physical education

teachers. Those who may wish to work with sport should not only be concerned with the technical level issues, with the motor and sportive gesture, with the motor skills of each one of their athletes, but they should also be concerned with the values and principles that guide and are inserted within the sport.

According to Paes (2002, p. 96), when working, for example, with younger athletes, the sport has to assume its function as a means to assist in the process of formation of the full development of the individual, a citizen possessing the full capacities to exercise its citizenship. Therefore, it is important to develop a formation of values, among them, highlighting trust, autonomy to take decisions, cooperation that contribute to avoid that the young athlete or even the professional athlete who practices a certain modality becomes affected by BS.

3.5 UNDERSTANDING OF PHYSICAL EDUCATION PROFESSIONALS AND SPORTS COMMUNITY REGARDING *BURNOUT* SYNDROME

In contemporary times, the demands related to sports go beyond a simple repetition and learning of the sportive gesture. In the same proportion and in the same evolution, the professional of the area of Physical Education, who has his/her function, goes beyond those ideas that he/she is a professional dedicated solely and exclusively to the technical training of athletes. It is known that the coach should be much more than an individual capable of teaching and training the specific sportive gesture of a certain modality. If it was like this, it was not necessary studies to become a coach, it would be enough just to have been a practitioner of the modality in which he/she wants to act (Chiminazzo; Montagner, 2004).

Therefore, the professional of the area of Physical Education, besides having all the theoretical training, must possess the capacity to be a professional that extracts values, forming integrated human beings, who are capable to preserve to the maximum their physical, psychic and mental health with satisfactory levels of quality of life. What it is observed in the current times is that it is not enough only to form athletes world champions at 14-15 years of age and that with 18 years of age they are abandoning certain sport, or in worse cases, along all this time, the athlete has not been guided, not receiving the due formation that he/she should to exercise his/her sport practice with quality. According to Paes (2002, p. 91), it is important that "the Physical Education professional understands sport and pedagogy in a broader way, turning them into facilitators in the education process of children and youngsters".

It can be verified that even working with sports at school, it becomes important that professionals trained in Physical Education have the ability to work with the sport, this because it will not always be in the sport and yes in the one who can work with it. It becomes fundamental that the professional has an ability to teach all the technical gesture, but it is as important to teach the values that are developed with the sport practice. Therefore, the education of young people needs to be directed to the world, forming citizens, so that they can exercise their role in society with integrity, active and always respecting the rights and duties (Paes, 2002).

In a professional sport sphere, it is also necessary that the physical educator has the ability to recognize the values and aggregating principles to sport and that they can be worked on continuously. In sport, to win is important, however, not primordial, the primordial is the development of individuals more and more integrated, who are capable of living in society, knowing how to respect the others and the social environment of which he/she participates, it becomes fundamental. In certain cases, the athletes are treated as if they were machines, not receiving any education besides the one that is considered necessary to be a winner. This reality needs to be altered, because one works with human beings, and one cannot allow them to be affected by problems of overtraining and episodes of BS that lead to a desistance of practicing certain modality (Chiminazzo & Montagner, 2004).

Another important factor to be considered is all the influence that the Physical Education professional comes to have with his athletes. It is very common that athletes reflect the personality of their coaches, that is, students fail to develop their own abilities and personality by mirroring themselves in the coach's figure. Therefore, it becomes important that the professional of Physical Education has the capacity to recognize the degree of its importance in the athletes' lives, since many times the time spent with the professional and the athlete is a much bigger time than the athletes spend with their families, especially with their parents (Chiminazzo & Montagner, 2004).

It becomes important, not only to inform the future Physical Education Professionals about the possibilities of the occurrence of BS in their athletes, but it becomes necessary that the professional is able to study the occurrence of such syndrome, its implications and, thus, the Physical Education Professional will be able to extend and to deepen its characterization seeking to know what their athletes think and feel, so that one can work not only the prevention of these problems, but preferentially, the promotion of a healthy global development of the already formed athletes and of the athletes in formation that are involved in the practice of the sportive activities (Chiminazzo & Montagner, 2004).

According to Gould et al. (1997), if coaches, parents and sport psychologists are familiar with all the characteristics of BS, they will be able to identify athletes who are suffering from *Burnout* and help them.

Finally, it is important to remember that the professionals who work in the area of Physical Education, whether they are educators, teachers and/or coaches are susceptible to suffering by BS. Therefore, it is very important that they come to know what is BS, that they can identify and fight and, mainly, prevent the emergence of such syndrome. The studies, researches and all materials need to be expanded in the literature, since the looks directed to BS are still scarce. For such a serious subject, there is a lack of studies. This syndrome has existed for a long time, but with a nomenclature that appeared recently, therefore, the national studies do not begin to crawl considering that the phenomenon plagues, for a long time, several athletes and sports professionals (Chiminazzo & Montagner, 2004).

4 FINAL CONSIDERATIONS

Burnout emerges as a response at a psychophysiological level, causing high exhaustion, many times at extreme levels resulting from excessive demands related to training and competitions. Therefore, such phenomena involve aspects of psychological and emotional levels and lead athletes to give up their objectives, that is, to perform a certain activity as a way to respond to stress levels or lack of satisfaction for performing a certain function. Thus, this syndrome can be characterized by a reaction to stress at a chronic level and its development represents a complex interaction between the environment, the personal and individual characteristics of each athlete.

The search through the literary material showed the most diverse motivations that lead a sportsperson to reach the extreme level, i.e., to exhaustion and, subsequently, to give up practicing what was his or her life for years, due to factors such as fatigue and overtraining. Therefore, it is essential that Physical Educators and Sport Educators in general, associated with the knowledge from psychology, know the concepts related to BS, know how to identify it and know how to deal with it along its emergence. Having the ability to differentiate and define such syndrome from other physical, social and psychological ills that may affect the life of a sportsperson becomes one of the physical educators' competences.

Considering the importance of the theme and the great relevance of information in this scope, both for the academic community and for the professional practice and athletes' health, it is still necessary and indispensable more studies about the Burnout Syndrome in high performance sport. In addition, subjects that involve a discussion about gender and the age range of the athletes are still scarce and can bring important elucidations, since it seems that there is a greater charge in female athletes and in athletes in formation.

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CHAPTER 11

Narratives by students of LGBTQ+ community in the space of the Federal University of Piauí: tensions and upheavals

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ABSTRACT

7KV DUWLFQHSUHVHQWV DQDQDOVLV RI WK QDUU
VWXGHQWV DW WK JHGHUDO 8QLYHUVLW\ RI 3LDX
6HQDGRU +HOYtGLR 1XQH GH %DUURV EHORQLQJ
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XSKDYDOV VXIIHUHQHFDXVH RI WK LU VH(XDO
RULHQWDWLRQ 7K UHVHDFWRORZHG WK TXDC
DSSURDFKDQG WK LQWHUSUHWDWLYH DQDOVLV
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WHQVLRQV DQG XSKDYDOV WK IHHODWV XQLYHU
8)3,&6+1% HPHUJHVDVDSOXUDODQGGLYHUVHVSDF
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RYHUFRLQJ DQG DEVHQFH RI MXGJPHQW RI VH
RULHQWDWLRQ:HGLGQRWILQGLQW QDUUDWLYHV
WHQVLRQV RUXSKDYDOVLQW KLULQLWLDOWUDLQ
QHJDWLYH LPSDFW %XW RQ WK RWKU BQG ZH IRX
WHQVLRQV UHODWHQV QKZOMHCH DQG IDPLO\
DFFHSDQFH DV ZHOODV XSKDYDOV UHODWHG
LQVHUVLRQ LQ WK ODERU PDUNHWUHWV QDUW S
VXEVLGLHV IRU IXUWKU GLVFXVLRQ DQG DQDOV
FRQWHIWRIRUPDWLRQRILQGLYLGXDOV EHOR
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Keywords: Graduate courses, Sexual orientation, Tensions.

1 INTRODUCTION

The topic of sexuality has been addressed in educational spaces in a shy way, this fact is associated with the multiple understandings of the subject making its approach complex as it involves a series of taboos, repressions and the attempt to reduce its dimension to genitality and reproduction.

As it is quite broad and is centered in the life of the human being sexuality encompasses sex, identities, gender roles, sexual orientation, eroticism, pleasure, intimacy and reproduction. It is expressed in thoughts, fantasies, desires, opinions and attitudes, in values, behaviours and practices, as well as in relationships, although not always all these dimensions that are included in sexuality are experienced (AMARAL, 2007).

In this context, the theme stands out for problematizing hegemonic values that endure for a long time in society. In this view, heterosexuality is assumed as a standard form of relationship, which follows the socially acceptable norms, while homosexuality is seen as a disease or disorder that must be treated to fit the subjects to pre-established social norms. Thinking heterosexuality as the only way to live sexuality manifests forms of repression and violence that are posed as homophobia (LOURO, 2004).

Sexual diversity exists and presents various forms of expressing human sexuality. Like Dinis (2008), we observe the initiative of some social instances in combating homophobic practices through the presentation of gender diversity, sexual desires and sexual relationships in spaces such as soap operas, series, miniseries, films, reports, books, news reports, among other channels. We perceive the University as a space of production and dissemination of knowledge, being an opportune place for discussions of this nature, in order to raise awareness of the academic and local community about respect for the sexual orientation of individuals and the desires linked to identities.

Thus, the present paper proposes to analyze the narratives of students from the LGBTQ+ community who find themselves in the space of UFPI/CSHNB, indicating tensions and challenges faced by their sexual orientation.

2 METHODOLOGY

The research followed a qualitative approach, considering that it can be characterized as the attempt of a detailed understanding of the meanings and situational characteristics presented by the narrators (SOUSA, 2006).

Written narrative was used as a research technique because we understand it as a way to understand the lived experiences and their meanings. Thus, the participants were communicated the attentive and willing writing of facts added to their sexual orientation. The experience here is understood as Larossa (1994), that which touches us, makes sense. For Clandinin and Connelly (2015, p. 48), studying the experience of narrative form makes sense, because, we build a repertoire of memories that construct our identity.

Thus, we take into consideration that:

[...] each one of us is already immersed in narrative structures that pre-exist to him and that organize in a particular way the experience, which imposes a meaning to the experience. Therefore, the history of our lives depends on the set of stories we have heard, in relation to which we have learned to build our own. The narrative is not a place of irruption of subjectivity, but the discursive mode that establishes the position of the subject and the rules of its construction in a plot. (LARROSA, 1994, p. 47).

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WRXQGHUVWDQG WKPHDQLQJV DVVLJQHG WR HDFRQHRIWKPFIFRUGLQJWR6RXVDDQG&DE
QDUUDWLYHLVRIXWPRVWLPSRUWDQFHEHHDIXVHPWIDQORZQWKHFRQVWUXFWLRQRIOLYH
KOSVLQWKISUHVHUYDWLRQRIVWRULHVERWKQLQGLYLGXDODQGFROOHFWLYHUHVHDUFK

Focusing on what was intended, we adopted the narrative of ten students from UFPI/CSHN, belonging to the LGBTQ+ community. Their names were kept anonymous so as not to cause any kind of damage to the participants, who were given fictitious names.

Aiming to capture the students' view of their academic trajectory, with tensions and challenges associated with their sexual orientation, we used the technique of interpretive analysis that helps us understand the data according to intentions and ideas and make inferences about the readings. Initially, a reading was performed to identify the subjects and facts and then a cross-reading of the data that enabled us to identify categories of analysis. And finally, a reading that allowed us to interpret the data in two categories: tensions and shocks.

The study was approved by the Research Ethics Committee (CEP) of UFPI/CSHNB under registration 3.983.006. The Informed Consent Form (ICF) was signed by all participants of this research.

3 RESULTS

With the description of the research participants (Table 1), 80% declared themselves homosexuals and of these 75% were born with male genitalia and 25% with female genitalia, biologically male and female. As for gender, 70% reported being male and 30% female. The participants are distributed in seven undergraduate courses of the UFPI/CSHNB: Nursing, Biological Sciences, Field Education, Literature, Pedagogy, History and Administration and are aged between 19 and 25 years.

For Santos (2017), the presence of LGBT students in Universities is increasingly notorious, however, it is still very difficult to know if students remain in Higher Education, because studies on this theme are incipient. The non-permanence of students in these training spaces may be associated with factors such as prejudice and homophobia.

Table 1- Participants' profile regarding sex, gender, age, sexual orientation and ongoing course.

Participant/ Fictitious name	Sex		Gender	Age	Sexual Orientation	Course
	Man	Woman				
Íris		X	Female	21	Homosexual	Administration
Emílio	X		Male	20	Homosexual	Biological Sciences
Sealtiel	X		Male	22	Homosexual	Nursing
Avril brick	X		Male	25	Homosexual	History
Pedro Henrique	X		Male	19	Homosexual	Field Education
Douglas	X		Male	19	Bisexual	Biological Sciences
Alice	X		Female	20	Bisexual	Letters
Andrade	X		Male	25	Homosexual	Pedagogy
Sun	X		Male	25	Homosexual	Pedagogy
Helena		X	Female	21	Homosexual	Nursing

Source: Prepared by the authors, 2020.

Category of analysis - "Tensions

We sought to identify in the narratives the "self-knowledge" from excerpts that indicate the perception of participants regarding the recognition of their sexual orientation and acceptance before family, society, groups and for themselves. Chart 1 presents the extracts of the representative narratives of the recognition of sexual orientation of the participants.

Chart 1- Extracts of the narratives regarding the identification of the sexual orientation of the research participants.

Sealtiel	<i>[...] I felt a little strange and different from the other boys in class or with whom I played, because I never liked to play with cars or somewhat aggressive games, not to mention that I always preferred to play with girls.</i>
Douglas	<i>Since childhood I was always, let's say, different from the other boys, I always liked to keep to myself, I didn't fit in much with the "boys" games, I didn't have many conversations, I was more sensitive and everything else, however, this was normal for me, because I was a child and I didn't know about things; as the years went by I grew up, entered adolescence and started to be persecuted by the so terrible "society standards", (ah, if you don't play ball with the boys, you are a "faggot"), [...].</i>
Emílio	<i>[...] I was always decided in relation to my sexual orientation, I never had doubts about what really attracted me and I always accepted myself as I am [...].</i>
Iris	<i>Long before I entered the Federal University of Piauí, I already noticed that I felt some love attraction for girls and only a feeling of friendship for boys [...].</i>
Pedro Henrique	<i>At 14 I had my first experience with a girl in elementary school and I didn't feel the desire to want more, I didn't feel the chemistry that my older friends commented that they felt when they first kissed.</i>
Andrade	<i>[...] to suffer prejudice, we have to put in mind when we talk about homophobia, sometimes a simple nickname can be considered a prejudice, and so since I was little I always had the "clichés", but in the school of the neighborhood where I live and studied I never suffered prejudice, I always had many heterosexual friends.</i>
Sol	<i>[...] it manifested itself very early in me in the question of starting it from the period of my puberty, at the beginning of my adolescence phase I already started to question what my sexual orientation was, which in this case is homosexual, and at first I didn't have so many problems in relation to acceptance because I already understood, it was a super natural thing and that I sought help and support within the family, that never denied me this kind of assistance, on the contrary, beforehand they already demonstrated complete concern in firming, let's say, the commitment of being on my side before any eventuality that could happen [...].</i>
Helena	<i>I knew I liked girls since I was a child, I don't remember exactly how old I was. I had already been with men, but I didn't think it was the same. Then, when I was 13, I was with a girl for the first time, and everything was perfect. It was a perfect fit. I assumed I was a lesbian to my mom and siblings as soon as I started my first relationship (when I was 19). I am the younger sister, I have two older brothers. My 26 year old brother was fine with it. My older brother didn't like it much, he is very jealous, but he didn't say anything either.</i>

Source: Prepared by the authors, 2020.

For the research participants, the perception of being different from the other classmates marks the beginning of the process of self-knowledge from the recognition of their sexual orientation. Taking as an example the position of Sealtiel "*[...] I felt a little strange and different from the other boys in the classroom or with whom I played [...]*". The perception by the taste of jokes, conversations, attitudes socially demarcated as masculine or feminine amid the daily routine brought out the desire for self-knowledge in the midst of personal conflicts concerning the tastes and comparisons with the other.

In the narratives, we noticed a discomfort regarding the way of being and being in the world about the positions assumed, thus, an avalanche of conflicting thoughts concerning the social position assumed in childhood and adolescence intended the participants for inner immersion in search of their identity. The

extract of Sealtiel's narrative helps us to understand this statement: "[...] *never liked to play with cars or somewhat aggressive games, not to mention that I always preferred to play with girls [...]*". The tension associated with group characteristics was also felt by some of the participants, in this way, the exclusion from the group is related to the development of practices that do not match with those accepted by the group. We can quote the fragment of the narrative of Douglas "[...] *ah, if you don't play ball with the boys, you are a "viadinho"*".

The socially accepted activities attributed to the participants are linked to their biological sex, and are considered female behaviour: playing with dolls, taking care of the home, cooking, sewing, among other activities; and male behaviour: playing ball, working outside the home, running, jumping, climbing trees, fighting, among many other activities. Society has always sought to impose belonging to a social group, defining very well the role of men and women in relation to masculinity and femininity (LOURO, 2001).

One of the ways of searching for the sexual orientation to be assumed appears associated with experiences of affective contact with the other, a factor that generates tension by insecurity in relation to the desire for the opposite sex, for the same sex, for both sexes or for none of the sexes. In this way, having a personal affective experience becomes the way to identify the acceptance or rejection by the loving contact with one of the sexes. This was the strategy used by Pedro Henrique: "[...] *I had my first experience with a girl in elementary school and I didn't feel the desire to want more [...]*".

For Louro (2001), contact with the other is a way of responding to one's desires and having pleasure, exercising one's sexuality, which may occur in many ways. What is unacceptable is the homophobia that reaches the LGBT group by not understanding that people have the right to relate freely, a factor that does not bring damage to personal singularities.

Self-acceptance in the narratives is associated with living with the family and in social spaces. In this way, we present in Chart 2 some extracts of the narratives that present tensions caused by the fear of family and social rejection of the participants' sexual orientation.

Chart 2 - Extracts of the narratives regarding the relationship between sexual orientation and tensions in the family context according to the research participants.

Sealtiel	<i>And the worst of it is that I felt guilty for it, for several reasons, among them, the fact that society puts homosexuality as something wrong and that is not standard, and also for family issues.</i>
Douglas	<i>I came to accept myself even at the age of 17, due to the fact that I was afraid of my family, due to my own fear of not wanting to be that, due to not understanding what it was to be LGBT and due to the very prejudice employed by my family members.</i>
Avril Brick	<i>[...] but I didn't relate to anyone due to the fact that I was living with my parents and they were very conservative (to the extreme), besides the town being very small and the rumors circulated fast, so that they reached their ears.</i>
Pedro Henrique	<i>The day came! We had lunch, I prepared my parents and my sister to say everything, and we said that we were gay and that we were dating. My father got up from the table and left without saying anything, my mother was in shock, but she didn't show much against it, and my sister said that she already knew.</i>

Avril Tijolo	<i>So they had a vision of me as a son who was going to get married, generate several descendants and continue our family. My parents are illiterate and lived practically all their lives in the countryside, so needless to say they understood almost nothing about homosexuality. The fact that I confessed to be attracted to people of the same sex as me, at that moment, was as if for them I would no longer be able to generate descendants, and this was totally opposite to their idealizations towards me.</i>
Andrade	<i>[...] when I left the evangelical church I got a boyfriend, I ended up assuming myself to my mother. My mother cried so much and I asked her if she was ashamed of me, and if she was like that, you know, disgusted. And my mother said no, that she already knew, but that she would know how much I would suffer in this life and she couldn't do anything, because when someone acted with prejudice against me she wouldn't be there to defend me most of the time, so she knew the situation that I was going through and would go through, and the cross that I would carry for the rest of my life, she was always afraid of someone doing something with me, and then my grandmother kind of got intrigued with me, she kind of kicked me out of the house, I had to go to Picos to spend a couple of weeks.</i>
Sol	<i>[...] I sought help and support within the family, which never denied me this kind of assistance, on the contrary, beforehand they already showed complete concern in firming, let's say, the commitment to be on my side in the face of any eventuality that could happen, and about this in my life I never suffered any kind of homophobic attack, physical and also no kind of embarrassing situation involving my sexual orientation.</i>
Helena	<i>My mother didn't think it was right, but it didn't stop me from continuing the relationship. We didn't talk about it until my girlfriend broke up with me for the first time. On this day, I could hear from my mother that my relationship was wrong, and that I should be dating a boy. Today I am still with the same girl, I sleep at her place but she doesn't come to my place.</i>

Source: Prepared by the authors, 2020.

Family rejection is something feared by the research participants, a factor associated with respect for parents and the values that were socially constructed in the group. The internal conflicts regarding the absence of sexual correspondence and characteristics of masculinity and femininity are generated by the breaking of socially accepted standards and by the desires attributed to peers within the family. Disappointing parents becomes a burden in the lives of participants by the absence of self-acceptance in the family presence and in some cases in social spaces, such as small towns of origin of the participants, the same was detected by Nascimento *et al* (2020) in their study.

The feared reaction of parents upon knowing the sexual orientation of their children makes them postpone the acceptance of themselves in front of the family and sometimes never get to declare themselves socially as to their sexual orientation, making them invisible before society and the longing for recognition as subjects builders of their historical process.

The tensions caused by the absence of self-acceptance can cause depression, suicide, low self-esteem, social reclusion, among others, since the family is still the social group to which the subjects belong, and it is the foundation for their formation and generates a sense of belonging and protection. Therefore, family acceptance brings comfort and tranquility to LGBT people through the veiled prejudice that still persists in society. Thus, support is essential, as Sealtiel says *"Today I have friends, family and people in general that I can relate to very well and that really accept me, it seems cliché to say this, but having support during this process is of the utmost importance for any gay person."*

According to Souza and Silva (2018), the condemnation of homosexuality has historical precedents and the family often excludes non-heterosexual members. It is known that the recognition and acceptance of the family are essential for homosexuals to build their identity and be able to face the world and situations

of discrimination and prejudice. It is necessary that the family is close to the homosexual, avoiding the history of violence that has accompanied this relationship, because the most important thing for homosexuals facing the exclusionary society is to have a solid base to stand on.

When the homosexual cannot assume his condition to his family, he ends up experiencing situations of conflict, anguish, fear, negative feelings, causing a psychological malaise that is highly detrimental to his health in general, which can lead to depression (POESCHL; VENÂNCIO; COSTA, 2012).

The University is composed of a diversity of subjects, a plural place full of people with varied conceptions of life and ways of being in the world. It is a space of production of culture and dissemination of ideologies. Chart 3 presents the extracts of the narratives that point to the University as a favourable space for self-acceptance.

Chart 3 - Extracts of the narratives regarding self-acceptance in the university space.

Douglas	<i>[...] I entered the biological sciences course, this part I personally did not feel difficulty in living together, because I always knew that at the university there was a huge diversity of beliefs, ethnicities, races, politics and, especially, countless diversities of sexual options; the people I met are extremely wonderful and do not care if you are gay, bi, lesbian, among others, they are people who look at your "character".</i>
Emílio	<i>[...] during my time of study at the University, until today, I have never suffered any kind of prejudice, violence and aggression, everyone treats me with respect, my friends, colleagues of the course, and the other students of the institution.</i>
Irís	<i>Some time not so far away, I realized the need to take this fear that bothered me, preventing me from being happy the way I am, so I decided to enter UFPI-CSHNB, in the course that I love, to learn to have responsibilities, attitudes not of a scared girl with fear of being happy, but of a strong woman and that today looks back and feels proud of who she is becoming, even with some obstacles to be faced yet.</i>
Pedro Henrique	<i>[...] I am also proud to say that here is my place in the world and I have never suffered any kind of prejudice in this environment, on the contrary, I am always accepted and have good coexistence with everyone I meet and make new friends daily, whatever the sexual gender.</i>
Avril Tijolo	<i>[...] I have always been very respected by teachers in general, by outsourced employees of the field and also by the students. I even got to "catch" myself with some quickly in some more hidden places within the university itself.</i>
Alice	<i>In my course in particular it never occurred to me to question or suffer any prejudice, however, when I had relationships with girls, when passing by the corridors, many people (mostly men) were left with sexist and fetishist questions, such as who was the man of the relationship and how the relationship occurred.</i>
Andrade	<i>When I started college I was already standing out, and as I already worked in the City Hall, so I was able to master many areas, and so, in a way, I haven't suffered prejudice at the University, neither with my professors nor with my classmates. So, not to say that I didn't suffer, thTijere was a conflict once when a girl called me "faggot bread and egg", and she was bisexual, I didn't understand. But then I understood that she didn't like me regardless of my sexuality or not, so it was the only episode that happened inside college that I felt a little</i>

	<i>prejudice, but at university I was gaining respect and I conquered my space, I entered the CA as director of finance, and so at university I am building my career, I did not graduate, but from the director of finance I went to the presidency of my CA, class leader, I joined the DCE as president, director and planning, I was part of the collegiate of my course, the campus council and, so, even today I am president of my CA and president of the imperial athletics of my course, so I was conquering my space among teachers.</i>
Sol	<i>[...] in the university environment I could be opening up to other gender issues that were new to me, I came into contact during the time I joined the student movement [...].</i>
Helena	<i>At the university I did not encounter any prejudice, on the contrary, I was always welcomed and respected by everyone.</i>

Source: Prepared by the authors, 2020.

The extracts present the university as a desired space for its flexibility and acceptance of what is plural and diverse. A place of coexistence of a diversity of subjects with different sexual orientations, ethnicities, genders, etc. This factor generates respect from its members to any form of being and being in the world. Thus, sexual orientation in this space does not define how intelligent, dedicated, good character the subjects are, but makes them unique.

In this context, being at university is a path that enables self-acceptance and acceptance of the other, a true fact when we use the extract from Pedro Henrique's narrative: "*[...] I am proud to say that this is also my place in the world [...]*", recognizing this space as diverse.

In the narratives we noticed the recognition of the participants regarding the treatment of students by teachers, technicians and outsourced staff of the institution, demonstrating that respect for cultural diversity present in the institution is not only among the students. It is necessary to emphasize that it is up to the University to offer training courses to its staff to properly serve its clientele, as well as to work towards equality and equity of rights in the university space and in other social spaces. Recognizing all subjects with their singularities is the first step towards reducing any form of prejudice or discrimination.

Universities should be spaces of acceptance of the LGBTQ+ public; therefore, it is necessary to build educational policies that avoid their exclusion in Higher Education, guaranteeing not only that they enter these spaces, but that they remain in them. Thus, it is important that this space also be a space of sexual orientation, aiming at student success, seeking to eliminate any situation of prejudice or discrimination against the LGBTQ+ community. The University needs to be a space of respect for the diversity of values, of rethinking taboos and prejudices and overcoming discriminatory behaviors (SANTOS, 2017).

Category of analysis – “Shocks”

Self-knowledge and self-acceptance often cause "shocks" in the LGBTQ+ community that suffocate and generate problems to be overcome. Thus, we present in Chart 4 some extracts from the narratives that point to homophobia, prejudice and insertion in the job market as obstacles caused by sexual orientation.

Chart 4 - Extracts of the narratives about the shocks caused to the research participants.

Emílio	<i>[...], my mother was always safe and protective with me, but after I told her the truth about me, she became even more protective, due to the reality of the country where we live, the cases of homophobia and everything else.</i>
Sieltiel	<i>Throughout this process I went through several complicated issues, which includes prejudice and discrimination at school, in the playground and also at university, already as an adult, I confess that there have been times when I had anxiety attacks and also nocturnal panic attacks, precisely because I had to face all these issues at a very young age and, at first, without any support.</i>
Douglas	<i>[...], because I never talked things about my feelings, my depressions and my sexuality with anyone.</i>
Pedro Henrique	<i>[...] it is not easy to live in a standardized society and we have to break taboos every day.</i>
Avril Tijolo	<i>I went through a strong depressive crisis after the first half of 2018 and practically during the first 10 months of 2019 [...], among other factors, because I am part of a group considered "minority" and that already has a history of having difficulties to get a job in this very competitive and macho labor market with strong presence of homophobia.</i>
Andrade	<i>[... Within the university there is prejudice, but in a way I have not suffered and do not suffer, thank God, but I know of several cases of people who have suffered prejudice within the university, but, particularly, today I do not know what it is in relation to prejudice, neither in college, in the workplace, nor at home and not in my family, not in my neighborhood, in fact, today everyone respects me, they know I'm gay, but telling you, I managed to build my character benevolent, you know, people respect me [...].</i>
Sol	<i>[...] exposed in risky and even often aggressive situations that threaten the physical integrity of individuals from the LGBT community, but it never happened to me. Unfortunately, we still live in a patriarchal, paternalistic society, much due to the issue of bourgeois influence and an ideal of elitism and conservatism that reinforces these stereotypes and this inequality, but it has never been strongly linked to my life story, because since very early I sought information that would lead me to have an awareness and a defense engagement, an energetic posture that I could face these adversities [...].</i>
Helena	<i>During high school I suffered prejudice, but I didn't let it get me down. My family treats me well, and that's what matters.</i>

Source: Prepared by the authors, 2020.

Homophobia is a violent practice that in the narratives appears associated with prejudice and fear that shakes both the research participants and their families, a fact evidenced in Emilio's narrative: "*[...] she became even more protective, due to the reality of the country where we live, the cases of Homophobia and everything else [...]*". Thus, living in a heteronormative society, where social standards must constantly be broken becomes a challenge for a minority, the LGBTQ+ group, as Avril Tijolo states.

It is worth mentioning that the norms and taboos imposed by hegemonic society also hinder the insertion of LGBTQ+ individuals in the job market, a fact presented in Andrade's narrative, by the non-acceptance of singularities and the lack of recognition of the right to be and be in the world with different conceptions of body, sexuality, beauty standards and behaviors. From the narratives it was possible to identify that participants suffered emotional, psychological and economic shocks for not fitting into the cultural standards said to be "normal" and acceptable.

According to Poeschl, Venâncio and Costa (2012), the revelation of homosexuality is often accompanied by practices of violence by family, friends and strangers, which leads the LGBTQ+ group to fear revealing their sexual orientation because society often excludes and discriminates them. Homophobia has been revealing itself in many ways; it manifests itself in society in general, in workplaces, schools and universities.

The LGBTQ+ group is the victim of several types of violence, verbal aggression, physical aggression, and many times these aggressions trigger consequences associated to psychological illnesses and physical wear and tear, besides, they also generate silence and social exclusion.

4 FINAL CONSIDERATIONS

Currently, many discussions have taken place about homophobia, prejudice and violence against the LGBTQ+ community. However, patterns of behavior and being that are socially accepted still prevail in our society to the detriment of others. Even in educational spaces, tensions related to sexual orientation are frequent, with heterosexuality being seen in a positive way and homosexuality in a negative way.

Self-acceptance goes through broad and complex processes that involve family and social relationships and shocks that generate anxiety, depression and fears that haunt the subjects for a long time. In the students' narratives, we found tensions related to self-knowledge and family acceptance, as well as shocks related to the insertion in the labor market. Family support is perceived as a source of permissiveness capable of ensuring a balanced environment so that the individual can assume sexual orientation and have a calmer life.


Reports from the participants indicate that the University (UFPI/CSHNB) is a space of free movement and expression of who one is. A place to vent, to feel included and safe to live out one's sexuality. In this way, we did not find in the reports tensions or shocks related to the experiences in this formative space, but rather perspectives of improvement in life and social acceptance in the midst of a plural and diverse group.

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CHAPTER 12

T g n c v k q p u j k r " d g v y g g p " r j c t o c e theory

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ABSTRACT

In the mid-nineteenth century, nursing as a profession was founded by Florence Nightingale, although it was not until the second half of the twentieth century that significant advances were truly made in the development of the profession. With the aim of establishing the relationship that exists between Florence Nightingale's theory and Pharmacology, the present work was carried out. A bibliographic review

of the current state of the subject was made in the Google academic, SciELO, Dialnet, and PubMed databases, with the keywords: Chronobiology, Chronopharmacology, Biological rhythms and Chronopharmacokinetics. In this review, it was evidenced that there is a direct association between the time of day in which the drugs are administered, and the pharmacological effects, especially due to changes in their pharmacokinetic variability, factors that also influence their safety, and in pharmacodynamics. The physiological processes that occur in our body follow the course of biological rhythms, so they must be taken into consideration in pharmacotherapy in order to guarantee greater therapeutic efficacy and greater safety. The elements described allow us to affirm the relationship between nature and man, as postulated by Nightingale, and pharmacology.

Keywords: Chronobiology, Chronopharmacology, Biological rhythms, Chronopharmacokinetics.

1 INTRODUCTION

In the mid-nineteenth century nursing was founded as a profession by Florence Nightingale, although it was not until the second half of the twentieth century that truly significant advances were made in the development of the profession, and the acquisition of skills by nursing staff, thanks to the theoretical and practical advances that were achieved at that time. The millenary practice of care from this period began to find theoretical justification through observation, description, explanation, prediction and control of the phenomena of their field of action, especially the care of individuals, family and community. (Naranjo-Hernández et al., 2020).

Theory coupled with practice has managed to base the actions of nursing as a science, which previously was only limited to the fulfillment of medical orders. This profession is not only dedicated to the exercise of the practical activity of health care, but also to education and research associated with the solution of problems arising from the exercise of the profession as such. The theory has contributed to the nursing the analyses and logical reasonings and the clarification of its ethical acting before in the studied phenomena. (Baeza et al., 2018).

According to Florence, every woman at some point had to serve as a nurse to take care of someone's health. She defined the nurse's responsibility to care for the health of others in her nursing note, where she also defined the guidelines for nursing practice and gave advice that would allow women to think like nurses when caring for the health of individuals. (Naranjo-Hernandez et al., 2020).

Florence Nightingale's theory fundamentally emphasizes the environmental determinants in the health-disease process, which has been a source of astonishment because it constituted a very revolutionary thought for her time where there were other theories generally enunciated by physicians, with emphasis on the biological. In this scenario Florence, defined the essence of the nursing profession that made it distinctive, and consisted of putting the patient in the best conditions for nature to act on him, also defining that nursing as a profession was based on the knowledge of people and their environment, which was a different vision seen until then by doctors for their practice of the profession. (Cano & Carmen, 2004)

Nightingale's postulates revolve around three key elements: the relationship of the patient with his environment, the relationship of the nurse with the patient and the relationship of the nurse with the patient's environment. (Cano & Carmen, 2004) Within these three elements, according to experts the least explained by Florence is the dimension of the relationship between the nurse and the patient, however, she made several observations in this regard. (Martínez Bentancourth, 2018)

In this order he postulated and I quote: "The nurse should explore the preferences of patients about the schedules of treatments and care, and about the contents and forms of food, whenever possible". (Cano & Carmen, 2004)

In relation to this last affirmation and putting into context the influence that the times of day in which drugs are administered can have on their effectiveness and safety, this paper aims to approach a branch of pharmacology that studies this phenomenon; Chronopharmacology.

2 METHODS

A bibliographic review of the current state of the subject was carried out in the databases Google Scholar, SciELO, Dialnet, and PubMed, with the keywords: Chronobiology, Chronopharmacology, Biological Rhythms, Chronopharmokinetics, looking for some level of association between Florence Nightingale's theory and Pharmacology. The review was carried out in English and Spanish. We used bibliography preferably from the last 5 years. However, previous publications with relevant elements that could argue the following work were taken into account. Thirty-eight articles with related topics were found, of which 15 were taken into consideration because they dealt with the topic in question in a more comprehensive manner.

3 RESULTS AND DISCUSSION

There is a direct association between the time of day in which the drugs are administered, and the pharmacological effects, especially by modifications in the pharmacokinetic variability of the drugs, factors that also influence in the safety of these, and in the pharmacodynamics. Biological rhythms affect among other factors the metabolism and elimination of drugs; in metabolism mainly because the liver enzymes with metabolic functions are sensitive to circadian oscillations, which directly influences the pharmacological effects and also the toxic effects. (Molina Cabrera, 2015), (Zhao et al., 2020).

The different scientific studies carried out in the field of chronobiology have eloquently demonstrated the influence that different biological rhythms have on the vital functions of living organisms. The biological rhythms are related to certain hormonal release at different times of the day that condition the behavior of human physiology, which in turn influences the organism at certain times of the day to present a better assimilation of pharmacological treatments. (Molina-Rodríguez & Akle-Álvarez, 2016).

Chronopharmacology is a relatively new area of study, which has modified the way to visualize some postulates that had been taken for granted regarding the effectiveness of pharmacological therapies, its basis lies in the concepts of chronobiology, which study the influence of biological rhythms in the interactions that exist at the cellular and tissue level with the environment. (Castellanos et al., 2016)

Although the concepts of chronobiology and chronopharmacology are not very new, their importance has not been understood by medical personnel and other health actors, which is why they are not generally taken into account when indicating a pharmacological therapy, nor have they been properly integrated into the behavior of the health-disease process, so biological rhythms are not taken into account and the biology of human beings is broken into without considering the consequences for health, or for the effectiveness of pharmacotherapy.(Camprubí Andaluz, 2017).

The biological and equilibrium processes that occur in the human organism course in time in a cyclical manner, gradually passing through several states until reaching their maximum and minimum values, within which we can mention the following: female menstrual cycle, cell cycle, sleep-wake cycle, hormonal variations of cortisol, melatonin, adrenaline, serotonin, among others. These variations determine that the organism is apt for certain functions in the schedules where the concentrations of these hormones present the highest levels of fluctuations. (Escagedo Cagigas, 2019)

In line with what was explained above, below are some health damages that can be caused by a break in the balance of some of the biological rhythms that occur in our body. Considering that ultradian or high frequency rhythms are those that occur in time less than 20 hours, infradian or low frequency rhythms are those that occur in time greater than 28 hours, and circadian rhythms are those that occur between 20 and 28 hours.(Tamosiunas & Toledo, 2010)

Table 1. Relationship between some biological cycles, the fisiology and pathological response of the organism.

No	Biological rhythms	Physiology	Pathology
1	Circadians	Sleep-wake cycle. Body temperature with afternoon acrophase. Morning acrophase (maximum peak): catecholamines, cortisol, platelet aggregability.	Sleep disorders, jetlag syndrome. Alterations due to rotating shift work. Higher incidences of acute myocardial infarction and ischemic-hemorrhagic stroke with a higher incidence in the mornings.
2		Renin-angiotensin-aldosterone system, blood viscosity, platelet activity, and blood pressure, Acrophase (nocturnal peak). Secretion of hydrochloric acid, hormone growth hormone, melatonin and bronchial reactivity	Increased incidence of gas troduodenal ulcers at night. Increased incidence of bronchospasm crises at night. Acute pulmonary edema.
3	Ultradians	Heart rate, respiratory rate and hormone secretion pulsating	Cardiac arrhythmias, polypnea, bradypnea
4	Infradians	Menstrual Cycle	Premenstrual Dysphoric Syndrome

Source: Adapted from the scientific article. Chronopharmacology: a new aspect to consider in the variability of therapeutic response.

The variability of the therapeutic response of drugs depends on different factors, and in each individual is usually expressed in a different way, they are very complex mechanisms and of different nature, ranging from the fisicochemical properties of drugs, through the pharmacotenicis used in the development, to age differences, sexual, genetic, polymedication, habits of drug consumption and prescription, as well as influyen also the fisiopathological situation of each individual. (Castellanos et al., 2016)

(Tamosiunas & Toledo, 2010) states that the aforementioned aspects are causes of modifications of the pharmacokinetic and pharmacodynamic variability of drugs, which coincides with what was stated by the authors Castellanos and Escobar. In addition, they state that the endogenous response of the organism to the different biological rhythms, in terms of biochemical, physiological, hormonal and pathological responses, also modifies the pharmacokinetic and pharmacodynamic parameters of drugs and therefore modifies the pharmacological response after the consumption of certain drugs, an approach in which the authors cited above also agree.

According to afirma (Tamosiunas & Toledo, 2010).According to the study of chronopharmacokinetics, chronopharmacokinetic studies are responsible for evaluating the temporal variation of different pharmacokinetic parameters, among which the half-life time and the time in which the maximum concentration of the drug is reached in the organism stand out; the rhythmic variation of several biological processes such as gastrointestinal secretion, blood flow, hepatic flow, glomerular filtration, affect the absorption, distribution, metabolization and elimination of drugs, so it cannot be guaranteed that these pharmacokinetic parameters are the same at different times of the day.

What has been stated by the previous authors is corroborated by the pharmacokinetic studies carried out to explain the factors that modificate the pharmacological effects of drugs, whether they are those that depend on the drugs through their fisicochemical and technological properties, as well as those that depend on the patient. (Molina Cabrera, 2015), (Bicker et al., 2020).

There are studies that have shown circadian variations at the hepatic level in cytochromes p450A3 and N-acetyltransferase which act in the metabolism of drugs in both phase I and phase II, this finding may increase or decrease the effect of the first hepatic step depending on the time of day in which the drugs are administered, which presupposes a variation in the pharmacological effects of the same. (Tamosiunas & Toledo, 2010). It is worth noting that chronopharmacokinetics is of vital importance for those drugs that have a narrow therapeutic margin such as: theophylline, lithium, carbamazepine, valproic acid, and digoxin, among others. (Molina Cabrera, 2015)

There is evidence of several drugs that when given in the same concentrations and in similar environmental conditions, where only the time of day has been modified, show different plasma concentrations. For example, in a study conducted by Orlando et al. in Uruguay, they found different concentrations of digoxin when given under the conditions explained above, only varying in that it was given in the morning in one case and in the other at night, and it was found that the maximum concentration of the drug was higher at night than in the morning.(Tamosiunas & Toledo, 2010),(Alloway et al., 2020)

The previous finding could be explained by the results obtained in other investigations where it is explained that in general in the mornings the metabolic processes are accelerated (Atienza Sánchez et al., 2016). A similar explanation could be given to the fact that other research has shown that thefilin when administered in the evening has better safety and efficacy than when administered at other times of the day. (Tamosiunas & Toledo, 2010).

Taking into consideration the information provided by chronopharmacology, therapeutic guidelines have been established for different pathologies, among which we can mention: treatment for hypercholesterolemia, because it is known that at night, between midnight and early morning endogenous synthesis of cholesterol increases, it is supplied lipid-lowering drugs in the late afternoon in order to reach maximum concentrations at times of increased synthesis. Arterial hypertension usually increases between six o'clock in the morning and up to twelve o'clock in the day, so it is recommended to administer the medication during the previous night in order to guarantee maximum concentration in the morning hours; in osteoarthritis the symptoms are more intense in the afternoon, so medication should be administered in the mornings. (Molina Cabrera, 2015), (Alloway et al., 2020)

Glucocorticoids are a group of drugs that are very frequently used in the current therapeutic arsenal, especially in inflammatory diseases and diseases of the immune system, among which bronchial asthma, rheumatoid arthritis, Crohn's disease, among others, stand out; It is known that the biological rhythms that affect our body influence the release of endogenous cortisol in our body, which is the first glucocorticoid in humans and if this element is not taken into account when administering these drugs can be affected by

the regulation of cortisol by the hypothalamus and inhibit the physiological production of this substance. (Scherholz et al., 2019)

There are many pharmacological strategies that take into consideration the variations of circadian rhythms, precisely taking into consideration the affectations that they cause in the different hormones of our human organism at different times of the day. The endocrine dysregulation produced by the release of cortisol can lead to the development of cancerous and metabolic diseases, depression, insomnia, among others; in these cases applying therapeutic mechanisms based on chronopharmacology is vital to achieve more accurate therapeutic effects that can influence biological, behavioral, biochemical and physiological changes. (Ohdo et al., 2019), (Bicker et al., 2020)

4 CONCLUSIONS


- ✓ The physiological processes that occur in our body follow the course of biological rhythms, so they must be taken into consideration in pharmacotherapy in order to ensure greater therapeutic efficacy and greater safety, which evidences the relationship between man and nature according to the theory of Florence Nightingale and pharmacology.
- ✓ Chronopharmacology plays an important role in the pharmaceutical industry, because it allows to adjust the design of pharmaceutical forms to the characteristics of the different biological rhythms, thus favoring the pharmacological effects of drugs.
- ✓ Adequate knowledge of biological rhythms allows modification of the pathophysiological course of many diseases and thus a better quality of life for patients.

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CHAPTER 13

Relevance of internal audit to public organizations and private: a systematic review of the literature

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ABSTRACT

This study aimed to analyze the relevance of Internal Audit (IA) as a management support mechanism in different organizations, given the need for reliable and useful information for decision-making in the context of globalization and increasing competitiveness. To this end, a systematic review of the literature was carried out, based on the Bank of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel of the Ministry of Education (CAPES/MEC) from 2016 to 2020. From a universe of 675 surveyed, 45 studies were identified, which showed the important role of AI for the maintenance and growth of the organizations object of analysis of these. Divided into two categories of analysis, the studies aimed at private companies have shown that AI is relevant due to the need to overcome managerial challenges, to achieve goals, to prevent fraud, to achieve the purposes of corporate governance and, consequently, to attract new investors. On the other hand, studies aimed at public institutions showed that AI is relevant due to the possibility of optimizing the use of public resources, greater transparency in the rendering of accounts to society and in the fight against corruption.

Keywords: Internal Audit, Management Tool, Organizations.

1 INTRODUCTION

Technological advances and rapid changes in the world of organizations in recent years, have caused greater complexity in the process of decision-making and required changes in the current forms of management of institutions. Per this, organizations have sought to improve their way of conducting activities, having in view of their demands for adaptation to the new demands arising from this new time. With this, it has been increasingly important and necessary to search for new strategies and accounting and management tools that enable the achievement of their purposes in a efficient and effective (MONTOTO, 2018).

Added to this, there is a need for transparency and symmetry in information, which private companies need to attract investors and organizations to justify their responsibility in the use of the public

resource. It is worth that the fierce competition in the market and failures in internal control are pointed out among the main reasons that leads to manipulation of numbers by administrators and company employees (ASSI, 2020).

In this context, accounting assumes an extremely important role. Exercising the functions of controlling and communicating economic information for the purpose to assist in decision-making by the administration (TIRLONI, 2020). To exercise this function, Accounting uses four techniques, namely: bookkeeping, financial statements, auditing and analysis of financial statements. In this study special focus is given to the Audit technique, which consists of a set of technical procedures applied for the purpose of analyzing and issuing an opinion to respect of the adequacy of the fundamental principles of Accounting and the determinations relevant legal requirements, in the records and in the preparation of the financial statements of a entity that must portray its real equity situation (CFC, 2003).

In Brazil, this entire accounting measurement and communication process went through major changes, resulting in greater rigor and greater demands on the accuracy of the economic and financial information reported in the financial statements accounting. Such changes occurred from the adoption of the International Standards for Accounting, from the International Financial Reporting Standards (IFRS). This one convergence of Brazilian norms with international ones originated in the expansion of international negotiations between companies due to the sale of products and services and other investments. Thus, in 2005, it was created in Brazil the Accounting Pronouncements Committee (CPC), the body in charge of formulation of accounting pronouncements in line with IFRS, a fact that started the entire process of change mentioned (MOREIRA at al., 2015).

It is worth noting that there are several classes of audits, among which are: internal audit; management audit; computer audit; operational audit, social audit. This work deals specifically with Internal Audit (AI), considered as an impartial and objective practice, which has the function of guaranteeing to the organization the control and the accuracy of transactions. Functioning as the entity's internal sector, it acts as systematic and methodical support in achieving organizational objectives, validating their risk management, control and corporate governance processes, and contributing to proposals to improve its effectiveness (IFACI, 2005).

Considering the aforementioned requirements, it is evident the need for action effective use of AI, both in public and private sector organizations, given that, in addition to providing greater reliability, accuracy and transparency in the information accounting, this tool also contributes to greater efficiency and effectiveness in administration and the achievement of organizational objectives, overcoming financial resources (MAIA, 2016).

Given the prominent role of AI in accounting and administration of different organizations, especially after the adoption of IFRS, there is an interest in to know the evolution of academic research on the subject, which motivated the conducting a study with the objective of analyzing the relevance of Internal Audit (IA) for organizations.

This is a qualitative research whose data were collected at from a systematic review of the literature, in the Bank of Theses and Dissertations of CAPES, in the area of Applied Social Sciences / Accounting Sciences, in the period of the search from 2016 to 2020. The data were categorized following the precepts of the Analysis Textual Discursiva de Moraes and Galiazzi (2007).

2 THEORETICAL FRAMEWORK

The financial statements are considered as an instrument of great importance in decision making by different users of information accounting, as they contain relevant data regarding the patrimonial, economic and an organization's finances. However, your information must be rigorously reliable so that, in fact, it fulfills its objective and serves as a means of communication between the entity and its stakeholders. In this sense, auditing is the technique accounting to be used in order to provide greater credibility to the information contained in the financial statements (BARTHOLD, 2020).

The aforementioned technique gained even more importance from the new requirements regarding the preparation and disclosure of financial statements by the companies, a fact caused by the adoption of IFRS in Brazil with the disclosure of the 10,303 in 2010. With this, the inspection of accounting practices and verification its compliance with international standards, employs the auditing role of fundamental importance and a prominent position in the literature and research academics (NARDI et al., 2018).

This technique is also conceptualized as accounting specialization to test the efficiency and effectiveness of the equity control implemented with the objective of expressing an opinion on certain data. It is a set of technical procedures that have with the objective of issuing an opinion on the adequacy of the records and statements with the Fundamental Accounting Principles and the specific legislation (CREPALDI; CREPALDI, 2016).

The term "Audit" comes from the Latin *audire*, defined by the English as an accounting review technique whose practices emerged at the end of the 18th century in the England as a result of the economic changes that took place in the period of the Revolution Industry (IBRACON, 2007).

Among the various audit categories found in the literature, AI has differential, in addition to the inspection, control and communication function that employs greater reliability of accounting information, the possibility of acting as a tool for

management that, through the analysis of records of accounting acts and facts, will remedy possible anomalies and also indicate actions that will bring improvements in the entity's performance audited, thus providing greater efficiency and effectiveness to its management (BARTHOLD, 2020).

However, it must have as much functional independence as possible and must be recognized by the top management in the company's organizational chart as a staff organ of the presidency, general direction or superintendence (FLORENTINE).

Resolution No. 986/2003 of the Federal Accounting Council (CFC) NBC T 12.1.1.4, refers to AI as a set of activities:

[...] structured in procedures, with a technical, objective, systematic and disciplined approach, and its purpose is to add value to the organization's results, presenting subsidies for the improvement of processes, management and internal controls, through the recommendation of solutions for non-conformities pointed out in the reports (CFC, 2003. p.3).

That said, it can be said that AI will be able to resolve any doubts and needs of companies and inhibit irregularities, since its function is to verify veracity of all information presented by the company in relation to documents, such as invoices, contracts, receipts, among others, including verification ownership and possession of the entity (ROSA; MOREIRA; HARANO, 2018). For that, the said activity must be carried out by a trained professional according to determines CFC resolution No. 781/95 that approves NBC PI 01:

[...] the accountant, in the role of internal auditor, must maintain his level of professional competence through up-to-date knowledge of the Brazilian Accounting Standards, accounting techniques, especially in the area of auditing, the legislation inherent to the profession, concepts and techniques administrative and legislation applicable to the Entity (CFC, 1995. p.2).

Considered an important management tool, AI makes it possible to distinguish, analyze, verify and report the information to the board, giving medium-sized companies and large knowledge of their real economic and/or financial situation,

instrumentalize it for the effective reduction of its costs and expenses, besides inhibiting eventual errors and frauds (SILVEIRA, 2004).

Regarding the objective of verifying the veracity of the information acquired for assist in the management processes NBCT - 12.1.1.3 of CFC Resolution No. 986/03 determines that the AI:

[...] comprises examinations, analyses, evaluations, surveys and evidence, methodologically structured to assess the integrity, adequacy, effectiveness, efficiency and economy of processes, information systems and internal controls integrated into the environment and management of risks, with a view to assisting the entity's management in fulfilling its objectives (CFC, 2003. p. 3).

It should be noted that the audit has basic and secondary objects. The first would be those of the opinion of the reliability of the financial statements and even extra-accounting statements, and the second, relating to matters such as discovery of errors and fraud, information about internal control, economic-financial assistance and others (PINHEIRO; CUNHA, 2003). In this regard, the CFC determines that “the term fraud applies to the intentional act of omission and/or manipulation of transactions and operations, document tampering, records, reports, information and financial statements, both in physical and monetary (CFC, 2003, p. 4).

The term error “applies to an unintentional act of omission, inattention, ignorance or misinterpretation of facts in the preparation of records, information and financial statements, as well as the entity's transactions and operations, both in physical and monetary terms” (CFC, 2003, p. 4).

Having highlighted the main concepts related to the AI theme, the next session presents the methodology used in carrying out this research.

3 METHODOLOGICAL CONTRIBUTION

This is a qualitative research, which according to Marconi and Lakatos (2010), emphasizes processes and meanings, having as a basic principle the interpretation of deeper aspects of the researched phenomena, with the providing more detailed analysis of investigations, attitudes and trends.

To reach the objective, the Systematic Literature Review was chosen (RSL), based on Kitchenham (2004), as it is a rigorous methodology, reliable, which allows reproduction and makes possible the identification, evaluation and interpretation of all relevant studies, in order to respond to a specific research topic.

The process comprises three steps: 1. Review planning, 2. Execution, and 3.

4 ANALYSIS OF RESULTS

For the planning and development of this study, the following was formulated guiding question: What is the relevance of Internal Audit in the management of Do you agree with the research (theses and dissertations) developed in the last five years?

To answer this question, data were collected from a survey in the Theses and Dissertations Bank of the Coordination for the Improvement of Higher Education Personnel (CAPES), in the assessment area “Public Administration and Companies, Accounting Sciences and Tourism” and the great area of knowledge chosen was “Applied Social Sciences”, and the search period used was from 2016 to 2020.

Also, the Brazilian Accounting Standards (NBC) were revised. The realization of research took place in November 2021.

Data were analyzed following the precepts of Discursive Textual Analysis by Moraes and Galiazzi (2007), who define it as a methodology for analyzing qualitative data, which allows new interpretations of the phenomena or researched speeches.

5 RESULTS AND DISCUSSION

Following the established search criteria (Table 1), we found six hundred and seventy-five (675) works, of which forty-five (45) presented in the titles the keywords "Internal Audit", with forty Dissertations and four theses. The works were read carefully in order to identify the evidence the relevance of AI as a tool to support the management of organizations.

Table 1 briefly shows the analyzed database, the criteria for inclusion and the amount of theses and dissertations found.

Banks of Data researched	Inclusion criteria	Number of searches
Theses Bank and dissertations from CAPES	<p>1. Keywords: Internal Audit; 2. Search period: 2016 to 2020; 3. Major Area of Knowledge: "Applied Social Sciences"; 4. Assessment Areas: "Public and Business Administration, Accounting Sciences and Tourism"; 5. Textsin Portuguese;</p> <p>6. Reading the titles and abstracts of the research found to identifykeywords and select related research to the topic discussed.</p>	41 Dissertations 4 Theses

Tables 2 and 3 show the relationships of the selected works, indicating the title of each research, authors, type Thesis (T) or Dissertation (D), defense date, Higher Education Institution (ES) in which it was carried out and the area of knowledge.

The analysis of the data with the ATD started with an in-depth and attentive reading of the texts followed by the rigorous application of the three phases indicated by the authors that advocated, namely: 1. Unitarization or deconstruction of the research corpus, characterized by the division of the text into units of analysis; 2. Categorization or grouping of units into categories and 3. Capturing the new emerging, constituted for the elaboration of a Metatext (MORAES and GALIAZZI, 2007).

In this study, the selected works were analyzed in compliance with the three phases mentioned above, which resulted in the construction of two categories: 1. Relevance for private organizations and 2. Relevance for public organizations.

The first category – "Relevance for private organizations, brings together the studies that address aspects that indicate the "objectivity" of AI in management as a tool capable of to boost the performance of companies, as shown in Table 2.

Table 2 - First Category of Analysis: Relevance for Private Organizations

	Title	Autor	Type year	IES
1	Relationship of Size, Expertise and Independence of the Audit Committee with Audit Quality	Bruna teixeira	D 2016 UFSCar -SC	Knowledge area C. Accounting
2	Applicability of the Audit to Evidence of Sustainability Practices in the Report. of Coop Management. Agroindustries in western PR	Marcia F. Rubber	D 2016 UFOPA - PR	ADM
3	Small and Medium Enterprises and Mandatory Disclosure: Effects of the adoption of IFRS, Audit and Indebtedness	Francesca N. Guanandy	D 2016 UFES - ES	C. Accounting
4	Audit Committee Characteristics and Performance Economics of Publicly Held Brazilian Companies	Wemerson G. Borges	D 2016 UFU-MG	C. Accounting
5	AI in an Org. Process Audit Approach, Collaborating in Business Decision Making	Sergio V. dos Santos Dias	D 2017 UERJ - RJ	C. Accounting
6	AI's Action Against Corruption: Institutional Logics and the Relationship with Org Strategies. financial	Anderson L. de Souza	D 2017 UNIP - SP	ADM
7	A Methodology for Estimating Audit Risk Based on Detection Software and Game Theory	Jose Felipe P. da Silva	D 2017 UFLA - MG	C. Accounting

8	8 Asymmetry of info. and audit quality: analysis of companies. listed in B3, in the pre- and post-convergence period to international standards	Tersio A. Junior	D 2018 UNB - DF	C. Accounting
9	Proposal for a Model for Measuring the Results of AI works	Vladimir V. Guedes	D 2018 UPM - SP	Accounting C
10	Analysis of the relationship between auditing, governance and financial performance	Naiara L. dos S. Sant Ana	T 2019 UFMG - BH	ADM
11	Background to the acceptance and adoption of continuous auditing by Internal auditors	Alexandre M.V. Birth	D 2019 PUC – SP	C. Accounting
12	A Theoretical Essay on Opportunities and Challenges for accountant she Auditorium	Sarah Vanin Giasson	D 2019 UNISINOS - RS	C. Accounting
13	Dems Audit Project Management Standards. Financial Services in the Light of Conc. PMO (Project Management Office)	Felipe H. Lopes Luiz	D 2019 UPM - SP	Accounting C
14	Big Data Analytics and the evolution of AI practices: a study on the antecedents of Tec acceptance and adoption. in the Brazilian private sector	Marcio K.	D 2020 USP - SP	C. Contábeis
15	Auditors and Auditees' Perception of AI Practices in an Emp. Basic Sanitation Service Provider	Celso T. Rodrigues	D 2020 UNIALFA - GO	ADM
16	Relationship between the main Audit issues and the Risks Published by Adm.	Francisco F. Diniz	D 2020 FECAP – SP	
17	Effects of Individual and Contextual Factors on the Quality of Audit Moderated by Emotional Intelligence	Cristiane A. S. Moura	D 2020 UFMS - MS	C. Accounting
18	Evolution of academic research on auditing in Brazil not period 1999 to 2018	Shirley Barthold	D 2020 UFU - MG	C. Accounting
19	Communities of Practice: Approaching Auditing and Management	Tiago Benetti	D 2020 URI - RS	ADM
20	Performance Indicators for AI with Business Principles Balanced Scorecard	Daniel Toller Janini	D 2020 UPM - SP	Accounting C.

Source: the authors (2020).

The second category of analysis, “Relevance of AI in the management of HEIs”, (Table 3), groups theses and dissertations that deal with prudence in the performance of good AI practices applied in the management of HEIs with a view to achieving their objectives.

Table 3 - Second Category of Analysis: Relevance for Public Organizations

	Title	Author	Type Year	IES
1	1 Public governance at the Federal University of Sergipe: an angular analysis of the relationship between AI, University Council and top management	Patricia T. de Araújo	D 2016 UFS – PE Public	ADM
2	The Management Challenges of Institutions' AI Units Federals of ES	Clovis John Schmitz	D 2017 UFSCAR - SC	ADM
3	The Role of AI in Brazilian Federal Universities	Rubens C. Rodrigues	D 2017 UFC - CE	ADM
4	The Role of AI in Public Governance: a study based on the view of the top management of Brazilian Federal Public Universities	Douglas R. Pine	T 2017 USCS - SP	ADM
5	Risk Management in AI Planning and Monitoring of Audit Recommendations in a Federal Institution of Higher Education	Priscilla M. Chaves	D 2017 UFU - MG	ADM
6	The Administrative-Operational Structure of a Fed Institution AI. teaching: a case study	Arthur P. Brandão	D 2017 UFS-SE	ADM Public
7	Balanced Scorecard as a Framework for the Activities of Operational Audit in Federal Education Institutions Superior	Giovana D. de Lima	D 2018 UFLA - MG	ADM Public
8	AI and Management: Case Study at a Federal University at Light of Institutional Theory	Leticia two P. P. Days	D 2018 UFRGS - RS	ADM Public

9	Innovation and Change in AI from the Federal Institute of Education, Pernambuco's Science and Technology: The Contribution of Appreciative Inquiry	Marcus MF Aquinas	D 2018 UFRPE - ON	C. Accounting
10	From the Compliance Audit to the Performance Audit: an overview of federal public universities from 2008 to 2016	Saulo G. Lins	D 2019 UBR - DF	C. Accounting
11	AI Units as an Assessment Instrument Organizational Performance of the Federal Education Network Professional, Scientific and Technological in the Northeast Region	Maria C. Grove GB Matsumoto	D 2019 UFAL-AL	ADM Public
12	Expectations Management in the IFRN AI Unit: a case study	Lawrence P. Mary	D 2020 UFRN - RN	ADM Public
13	The Effectiveness of AI Units in Federal Universities Brazilian women: analysis of the perception of AI members and senior management	Natalia G. de Souza	D 2020 UNB - DF	C. Accounting
14	The Role of AI as an Auxiliary Governance Instrument Public in the Federal Institutions of Higher Education: a case study in a Federal Institute in Paraná	Luiz Eduardo C. Jenkins	D 2020 UFPR - PR	C. Accounting
15	Expectations Gaps of Managers and Internal Auditors in Relation to Performance Indicators at a University Federal Public	Erves Ducati	T 2020 UFSC - SC	C. Accounting
16	Operational Audit at the Audit Court of the State of Santa Catarina: Current Practices and Prospects for Advances	Roberto S. Fleichnab	D 2016 UDESC - SC	ADM
17	The Capacity of AI Activity in the Federal Executive Brazilian	Leonardo L. C. Marine	D 2017 UFBA - BA	ADM
18	Operational Audit using Activity-Based Management - ABM: Study in a Military Organization of the Brazilian army	Sydney by M. Lisbon	D 2017 UNISINOS - RS	C. Accounting
19	Gamification as Strat. of Knowledge Sharing in AI processes in the SENAI Test Laboratories	Raphael v. Silva	D 2018 UDESC - SC	ADM
20	Accounting and AI in the Brazilian Public Sector: perceptions of Public Accountants facing the convergence to the IPSAS/IFAC	Luciane R. Brands	D 2019 FUCEPE - RJ	C. Accounting
21	Essays on Legibility of Accountability and Reporting. of Auditing and its Impacts on the Accountability Process in the Public Sector in Brazil	Olavo V. syrups	T 2020 UNB - DF	C. Accounting
22	Impact of artificial intelligence on audit activity: equating bottlenecks in transfers from the union to subnational entities	Sergio Tadeu N. Carvalho	D 2020 FGV-RJ	ADM
23	The king's adviser: the role of AI in the corporate governance of banks in Brazil	Volnei A. de Freitas	D 2016 FGV - SP	ADM of companies
24	The Relevance of AI in Corporate Governance in a Mixed Economy Financial Institution	Joseph Luis R. Junior	D 2017 FMU - SP	ADM
25	Framework proposal for the use of Robotic Process Automation at AI of National Banks	Ana Paula C. T. Penna	D 2020 PUC - RJ	ADM of companies

Source: the authors (2020).

After categorizing the data, the third phase of the analysis was carried out with the elaboration of a metatext, called by Moraes and Galiazzi (2007) as “capturing of the new emerging”. It is a synthesis of the categorized data, in which the researcher attributes his/her new understanding of the researched phenomenon.

Metatext

The first category of analysis, “Relevance to private organizations”, presents the grouping of twenty (20) researches, being nineteen (19) dissertations and one (1) thesis. These works aimed to answer the question: what are the relevant aspects identified in the performance of AI in private sector organizations?

Among the answers presented are: 1) the “expertise” and “independence” of the companies' audit committee, such as the factors that validate the quality of AI and its contribution to increasing confidence in financial statements (TEIXEIRA, 2016);

2) the contribution of audit procedures to “evidence” the actions and practices sustainability in the management reports of agroindustrial cooperatives (KUMM, 2016). 3) the “capacity to influence” assertive decisions of managers and users external, using the Process Audit approach (DIAS, 2017); 4) to contribution of AI, as a “control tool” aligned with the strategies institutional, to avoid the occurrence of corporate fraud and corruption to which organizations are subject, despite the establishment of specific rules against these practices (SOUZA, 2017); 5) “agility” in the collection, analysis and synthesis of large amounts of data originating from various sources (IGUMA, 2020); 6) the “orientation for risk control” as the quality of AI (RODRIGUES, 2020).

The second category “Relevance to public organizations” brought together twenty-five four (24) researches, three (3) theses and twenty-one (21) dissertations. These had as scope the investigation about the role of AI in strengthening processes governance within the scope of different public bodies. The results indicated the following factors: 1) The “ability to identify improvement points” model in the AI processes currently developed by the Federal Secretariat for Control Internal; 2) The “inspection” of the performance of the public sector, in the sense of increasing the citizens' trust in relation to those responsible for the management of public resources, in addition to promoting greater commitment on the part of the manager to the results of policies implemented public policies (FLEISCHMANN, 2016); 3) The ability to contribute to solutions for public accounting in the sense of “communication of information reliable” to the most diverse stakeholders. However, in the opinion of accountants working in the public sector, there needs to be greater investment in training, greater interest of top management with the reduction of political pressures and greater cultural adaptation of the bodies against the application of the Brazilian Accounting Standards Applied to the Sector (NBCASP) and the Accounting Manual Applied to the Public Sector (MARKS, 2019).

In addition, aspects were identified that demonstrate the relevance of the of AI in the strategic and risk management of Brazilian public universities, such as: 1) The Improved “interaction” with the university council and the administrative top, in the implementation of the guidelines that govern public governance (ARAÚJO, 2016). 2) The adequate “training” for institutional risk management policy with good staff, computerized systems and the support of the leaders are proposed as actions of strengthening of AI units as outlets to overcome managerial challenges and make an efficient and effective management tool in the “fight against wasted resources”, formal failures and, ultimately, corruption (SCHMITZ, 2017); 3) The

“Controls Management” with an operational focus of advice and guidance to managers, monitoring the implementation of recommendations from the control bodies internal/external and issuance of reports promoting “active transparency” on the part of the unit (RODRIGUES, 2017); and 4) “ Compliance assessments” and “compliance assessments” performance” in the performance of the manager as it reaches maturity, becoming more efficient in their decisions.

Finally, the second category included aspects about the role of AI as a mechanism for evaluating policies, procedures and processes based on the operational environment of public financial organizations. Among the main factors presented are: 1. The potential of AI as an “input generating mechanism for decision-making”, linked to the Corporate Governance System (SGC) of institutions companies operating in Brazil, in addition to “monitoring” their performance in the complex banking operating environment (FREITAS, 2016); 2. The “support for reaching the purposes” of corporate governance in mixed capital financial institutions (REZENDE JÚNIOR, 2017); 3. The possibility of implementing “robotic automation” of processes in the AI of Brazilian banks (PENA, 2020); and 4. The “effectiveness in performance” of AI with the application of the Balanced Scorecard principles, in the “improvement of the governance process” and assistance to top management in achieving the strategic purposes, using didactic material for the development of Indicators of Performance in Public Financial Institutions (JANINI, 2020).

5 FINAL CONSIDERATIONS

In order to identify the relevance of AI as a management tool in different types of organizations, a systematic review of the literature was carried out in the Database of CAPES Theses and Dissertations, in order to collect data about the postgraduate research, at the *stricto sensu* level, carried out in the last five years, in the assessment area “Public and Business Administration, Accounting Sciences and Tourism” and in the broad area of knowledge “Applied Social Sciences”. The search resulted in selection of 45 studies, whose titles and abstracts contained the keywords “Audit Internal”.

The data were analyzed in the light of the ATD, which gave rise to the construction of two analysis categories, which revealed aspects that validate the relevance of AI in public and private organizations.

Evidence of the relevance of AI in business organizations was identified, which concern their applicability in the disclosure of practices of sustainability in the management of cooperatives, its performance driving of Brazilian Publicly Traded Companies and, consequently, in attracting of investors. In addition, its decisive support in making strategic decisions, its action in the fight against corruption, the reduction or elimination of risk with the use of detection software and the reduction of agency conflicts caused by the asymmetry of information.

In public sector organizations, although there is a need for greater investments in training accountants, the reduction of political pressures and better adaptation of bodies in the application of NBC and MCA applied to the public sector, AI is extremely relevant due to factors such as: its practices as an supervisory authority, the increase of confidence on the part of society in the management of public,

promoting greater manager commitment, fighting corruption and promoting greater responsibility in the management of public resources.

In view of the results presented, it is considered extremely important to implementation and maintenance of AI in public and private organizations, taking into account the countless demands or pressures they are exposed to in order to achieve their objectives, the current demands for reliable implementation of the guidelines that govern the public governance, efficient and effective management in overcoming managerial challenges, as well as as, in the fight against the waste of resources, the formal failures, the corruption and the promoting transparency.

Regarding the limitations of the research, although a result was obtained expressive of the way it was performed, it is worth noting the impossibility of perform the search in other databases, as well as in other areas of evaluation, there is view that would require more time and effort, however, would allow a vision expanded the relevance of the topic.

In this way, it is suggested the development of new researches in other bases data, in other areas of evaluation and knowledge, with a view to identifying of new factors that further encourage the emergence of this theme, considering the the need for increasingly transparent and ethical action by different organizations established in Brazil.

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CHAPTER 14

Evolution of teacher training courses after implementation of the national higher education assessment system in Baixada Santista

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ABSTRACT

The National Higher Education Assessment System (SINAES) created in 2004 has the purpose of improving the quality of higher education, to value public investments and give due return to society. Composed of three basic axes: assessment, regulation, and supervision, SINAES seeks to ensure the integration of internal and external dimensions, the particular and global approach, the somatic and formative aspect, as well as the quantitative and qualitative analysis of the evaluation. The objective of this study was to evaluate teacher training through a comparison between indicators from SINAES, Preliminary Course Concept (CPC) and the National Student Performance Exam (ENADE) to contribute to the improvement of teaching practices in teaching, fundamental, identifying the evolution of these indicators in Baixada Santista. For this, a comparison of the results of the pedagogy courses referring to the ENADE and CPC indicators was carried out based on the information from the Annual Census of Higher Education carried out by the Ministry of Education, highlighting the administrative category, academic organization, and teaching modality. The result points to an increase in pedagogy courses with an unsatisfactory ENADE concept and an increase in courses with a CPC concept of excellence.

Keywords: Teaching, Education, Higher, Educational Measurement, Learning.

1 INTRODUCTION

The four pillars of education guide pedagogical projects from basic to higher education, due to their integrative nature that is compatible with individual needs and which, according to Delors' (1996) definition, are: learning to know; learn to do; learning to live with others; and learn to be. In this way, we verify that the objectives are not just the creation of an intellectual individual, but a concept of vital

formation of the human being, complementing the individual and collective spheres (Pereira, 2012; Ambrosio, 2015).

Undergraduate courses in Brazil must seek excellence not only for their professional nature, but also to insert increasingly qualified professionals into the job market. Several specialists agree that a country only develops through education and when it comes to education, nothing is more fundamental for society than basic education, where the permanent search for human development is faced with different sociocultural realities. From this perspective, care for basic education teachers should be a permanent objective for Brazilian public policies in search of a dignified quality of education as in more developed countries. The training of teachers for basic education in Brazil, in recent years, has undergone major reformulations. Educational policies based on current legislation and official documents, whether at the Federal, State or Municipal level, in the different modalities of teaching, require a rethinking of training courses and teaching practice in terms of conception, meaning, structure, conditions, teaching practice, among others, since the current model no longer seems to satisfy educators and society in general, given the frequent disagreements, criticisms and reflections that are made around teacher training and performance (Jardilino et al., 2021).

Educational policies help in the evaluation of teaching performance by highlighting the skills of this professional, as well as reaffirming them from the verification of the same in a process of career progression. Given the concern of teachers in the face of an evaluation system that does not reproduce their true responsibility and professional commitment (Carvalho & Ribeiro, 2020).

The four pillars of education guide pedagogical projects from elementary to higher education, due to their integrative nature that is compatible with individual needs and which, according to Delors' (1996) definition, are: learning to know; learn to do; learning to live with others; and learn to be. In this way, we verify that the objectives are not the creation of an intellectual individual, but a concept of vital formation of the human being, making up their individual and collective spheres (Pereira, 2012; Ambrosio, 2015).

The concern with the quality of teaching practice has lasted for several decades, passing through the enactment of the Law of Directives and Bases from 1996 to the present day. Criticism of theory-based training models has always had voices in discussions on the subject, strengthening itself in the last 20 years. There seems to be a consensus that teacher training curricula, based on the model of technical rationality, are inadequate to the reality of professional teaching practice. The main criticisms attributed to this model are the separation between theory and practice in professional preparation, the priority given to theoretical training to the detriment of practical training and the conception of practice as a mere space for the application of theoretical knowledge, without its own epistemological statute (Pereira et al., 1999). The role of evaluations and the mechanisms of control, regulation and inspection have become fundamental, for higher education institutions to develop their functions in the production of knowledge, with a focus on global training, also becoming an instrument for creating a sense of citizenship in Brazil (Dias Sobrinho, 2008).

In Brazil, some proposals for higher education and evaluation stand out, which were expressed in the following documents: Program for University Assessment and Reform (PARU) created in 1983. It also reports the process of creating the National Commission for the Reform of Higher Education (CNRES) in 1985 and the Executive Group for the Reformulation of Higher Education (GERES) in 1986. Emphasizes the implementation process of the Institutional Assessment Program of Brazilian Universities (PAIUB) in 1993, as well as the ENC (National Course Exam) (Kraemer et al., 2016).

One of the evaluation processes of higher education courses and institutions was the National Course Examination - ENC, known as Provão, which ran from 1996 to 2003. In 2001, the National Education Plan (PNE) was approved, which changed the rules of organization and evaluation of courses and Higher Education Institutions (IES) in Brazil. These legal provisions became the main documents governing requirements for the existence of universities. In September 2003, the CEA (Special Evaluation & RPPLVVLQRQSUHVHQWHGWKHGRFXPHQW, WSRQDOLJKHU(GXFDWLRQ(YDOXDWLRQ6VWHP% 2004; SINAES, 2004).

The National Higher Education Assessment System - SINAES, was created in 2004 and the central axis of SINAES promotes the integration and participation of fundamental concepts for the construction of an assessment system capable of deepening commitments and responsibilities (Barreyro , 2006) .

The evaluation of the performance of students in undergraduate courses, based on SINAES, will be carried out by applying the ENADE (National Student Performance Exam), considered a mandatory curricular component of undergraduate courses, with the objective of measuring the performance of students in relation to the syllabus provided for in the curricular guidelines of the respective course, their abilities to adjust to the requirements arising from the evolution of knowledge and their competences to understand topics outside the specific scope of their profession, linked to the Brazilian and global reality, as well as to other areas knowledge (Brazil, 2004). Therefore, ENAD is one of the evaluation axes of SINAES, responsible for evaluating public and private Higher Education Institutions, identifying the performance of university students and the characteristics of the courses (Teixeira et al., 2020).

In this way, ENADE becomes an expressive instrument of assessment and transformational self-assessment that, according to Mazzurana and Jung (2014), are based on the principles of the National Commission for the Assessment of Higher Education (CONAES), which stimulates the production of knowledge through a set of activities and meanings defined by the HEIs themselves. This knowledge stimulates the analysis of recognized difficulties and deficiencies, being a moment of reflection of the relevant aspects and of search of the pertinent solutions of the presented reality. Considering the social role that the HEI itself plays within its physical and intellectual space of transformation. (Silva, Rocha & Soares, 2015)

The ENADE Assessment Cycle determines the assessment areas and the courses linked to them. The areas of knowledge for the bachelor's and licentiate courses derive from the table of areas of knowledge published by the National Council for Scientific and Technological Development (CNPq). The

technological axes are based on the National Catalog of Higher Technology Courses (CNCST), of the Ministry of Education (Brasil, 2004).

The Preliminary Course Concept (CPC) is composed of evaluations such as the Graduates' Grade in the ENADE of the undergraduate course; Score of the Difference Indicator between the Observed and Expected Performances of the course; Proportion score of Masters of the undergraduate course; Proportion note of Doctors in the undergraduate course; Undergraduate Course Work Regime Note; Note regarding the didactic-pedagogical organization of the undergraduate course; Note regarding the infrastructure and physical facilities of the undergraduate course; Note referring to opportunities to expand the academic and professional training of the course. These dimensions cover all aspects of an undergraduate course: Pedagogical Didactic Organization, Faculty and Infrastructure (Ikuta, 2016).

This study aimed to evaluate the teacher training of the Pedagogy course in Baixada Santista through the comparison of data between ENADE and the Preliminary Concept of CPC Course, after the creation of SINAES in order to contribute to the improvement of teaching practices in elementary school. .

2 METHODOLOGY

This is a study of document analysis of the current legislation and the indicators coming from the regulatory bodies of the Ministry of Education. The Document Analysis had as sources of data, the collection of regulatory bodies of the Ministry of Education. After capturing the data sources and their documents that validated them, the data organization was carried out in order to make them intelligible, and only then, carry out the analysis itself (Pimentel, 2001).

A comparison of the pedagogy courses in Baixada Santista was carried out through the crossing of information and results of the main evaluation indicators of ENADE and CPC graduates in order to present the theoretical-cognitive development expected for the professional training of the teacher.

2.1 SAMPLE

For this research, the analysis was limited to the Pedagogy Licentiate courses offered in Baixada Santista that are submitted to the National Education System.

2.2 DATA COLLECTION INSTRUMENT

The data that supported this research come from reports published by government agencies that regulate Brazilian Education, especially the National Institute of Educational Studies and Research Anísio Teixeira (INEP).

2.3 DATA ANALYSIS

For a better understanding of the analysis of the quality of teacher training, we divided the exposure of data from the Pedagogy courses according to the INEP results report on the ENADE and CPC indicators

in view of the evaluation cycle. The evaluation cycle of ENADE being the years 2005, 2008, 2011 and 2017; already from the CPC the years 2008, 2011, 2014 and 2017.

3 RESULTS

3.1 ENADE

The National Student Performance Exam (ENADE) assesses the knowledge acquired during the completion of the higher education course of the finalist students of the respective courses. Its result tends to demonstrate how much the student assimilated the skills and competences developed during the course. Theoretically, the lower the ENADE concept, the less knowledge was acquired.

Data referring to the ENADE Concept in Baixada Santista in the evaluation cycle from 2005 to 2017 are described in Table 1.

Table 1. Pedagogy Courses with ENADE Concept in Baixada Santista Assessment Cycle from 2005 to 2017.

CURSOS DE PEDAGOGIA BAIXADA SANTISTA					
CONCEITO ENADE	NÚMERO DE CURSOS				
	2005	2008	2011	2014	2017
1	0	0	0	0	0
2	0	0	0	1	4
3	6	5	7	7	7
4	3	5	4	6	3
5	0	1	2	0	1
TOTAL GERAL	9	11	13	14	15
MÉDIA	3,3333	3,6364	3,6154	3,3571	3,0667
DESVIO PADRÃO	0,5	0,6742	0,7679	0,6333	0,8837
MODA	3	3	3	3	3

Source: Author.

According to the data related to the number of pedagogy courses in Baixada Santista, we can see in Table 1 that there was an increase from 9 in 2005 to 15 in 2017. Regarding the ENADE Concept, we can see that in the years 2008 and In 2017 we had a course with concept 1 and in 2011, 2 courses with the same concept, and in 2005 and 2014, no course reached this concept.

Table 2 presents the evolution of the ENADE proportion of Pedagogy courses in Baixada Santista and Table 3 the comparative ENADE 2005/2017 Pedagogy courses in Baixada Santista.

Table 2. Evolution of the ENADE proportion of Pedagogy courses in Baixada Santista

ENADE BAIXADA SANTISTA	RATIO 2005	RATIO 2008	RATIO 2011	RATIO 2014	RATIO 2017
1	0.00%	0.00%	0.00%	0.00%	0.00%
2	0.00%	0.00%	0.00%	7.14%	26.67%
3	66.67%	45.45%	53.85%	50.00%	46.67%
4	33.33%	45.45%	30.77%	42.86%	20.00%
5	0.00%	9.09%	15.38%	0.00%	6.67%

Source: Author.

Analyzing the data in Table 3, we can see that the Pedagogy courses in Baixada Santista had a significant proportional change in the concept of the ENADE indicator in 2005 there were no courses with concept 1 and 2. This participation started in 2014 with 7.14% of courses and increased in 2017 to 26.67% of courses, while concepts 4 and 5 went from 33.33% in 2005 to 26.67% in 2017. This analysis alone demonstrates that the number of courses with concepts above regular (grade 3) decreased, while the number of courses with below-regular grades grew.

Table 3. Comparison ENADE 2005/2017 Pedagogy courses in Baixada Santista.

ENADE BAIXADA SANTISTA	RATIO 2005	RATIO 2017
Bad (1 and two)	0.00%	26.67%
Regular (3)	66.67%	46.67%
Good (4 and 5)	33.33%	26.67%

Source: Author.

In Table 3, we observe that the Pedagogy courses in Baixada Santista, whose ENADE rating was below the regular one, grew from 0% to 26.67%, from its first evaluation (2005 Cycle) to the last one (2017 Cycle) and in the same period the The group of courses with a higher than regular ENADE grade decreased from 33.33% in the first cycle against 26.67% in the last evaluation cycle.

3.2 CPC

The Preliminary Course Concept (CPC, in Portuguese) is the best indicator for analysis and comparison with ENADE, since its composition brings information from ENADE itself, from the Census of Higher Education and from the view of the graduate regarding their course and HEI, through the questionnaire carried out in the exam of the ENADE

Data referring to the ENADE Concept in Baixada Santista in the evaluation cycle from 2005 to 2017 are described in Table 4.

Table 4 presents the data for the CPC Concept of the Pedagogy Courses of Baixada Santista in the evaluation cycle from 2008 to 2017.

Table 4. Pedagogy Courses with CPC Concept in 2017 in Baixada Santista.

BAIXADA SANTISTA PEDAGOGY COURSES				
CPC CONCEPT	NUMBER OF COURSES			
	2008	2011	2014	2017
1	0	0	0	0
2	2	0	0	1
3	7	6	9	7
4	1	6	4	6
5	0	1	0	1
GRAND TOTAL	10	13	13	15
AVERAGE	2.9	3.6154	3.3077	3.4667
STANDARD DEVIATION	0.5676	0.6504	0.4804	0.7432
MODE	3	3/4	3	3

Source: Author.

We can see in Table 4 only in the years 2011 and 2014 we had a course in each year with the CPC 1 concept.

Table 5 shows the evolution of the CPC proportion of Pedagogy courses in Baixada Santista and Table 6 the CPC Comparison 2008/2017 Pedagogy courses in Baixada Santista.

Table 5. Evolution of the CPC proportion of Pedagogy courses in Baixada Santista.

CPC-BAIXADA SANTISTA	RATIO	RATIO	RATIO	RATIO
	2008	2011	2014	2017
1	0.00%	0.00%	0.00%	0.00%
2	20.00%	0.00%	0.00%	6.67%
3	70.00%	46.15%	69.23%	46.67%
4	10.00%	46.15%	30.77%	40.00%
5	0.00%	7.69%	0.00%	6.67%

Source: Author.

In Table 5, we observe the results of the CPC indicator for the Degree in Pedagogy courses in Baixada Santista in 2008, 2011, 2014 and 2017, demonstrating that the courses had a significant proportional change in the concept of this indicator. In 2008, 20.00% of the courses had grades 1 and 2. This share decreased in 2017 to 6.67% of the courses, while grades 4 and 5 went from 10.00% in 2008 to 46.67% in 2017. This analysis, by itself, demonstrates that the number of courses with grades above the regular (grade 3) has increased, while the number of courses with grades below the regular has decreased.

Table 6. Comparison CPC 2008/2017 Pedagogy courses in Baixada Santista

CPC-BAIXADASANTISTA	RATIO 2008	RATIO 2017
Bad (1 and 2)	20.00%	6.67%
Regular (3)	70.00%	46.67%
Good (4 and 5)	10.00%	46.67%

Source: Author.

Table 6 shows that the CPC concept, in the group of Pedagogy courses in the first evaluation cycle, registered 20.00% of concepts 1 and 2, and that it decreased to 6.67% in the last cycle, while the excellence group with concepts 4 and 5 went from 10.00% to 46.67%.

4 DISCUSSION

Brazilian Education is a recurring theme in the most diverse spheres of debate because it is a subject so intrinsic to society. The country that seeks a fair, fruitful and successful development, has to focus on the practice of planning a strong and vigorous educational system.

In the process of teacher training, it is necessary to consider: the importance of areas of knowledge, since it is not possible to teach what is not known; and pedagogical content, therefore, teaching has several aspects in the sense of human formation. However, the reality is that teachers are often prepared to be researchers and not teachers (Pimenta & Anastasiou, 2002).

Brazil has an educational system of stages based on Early Childhood Education (literacy), moving on to Elementary Education (basic education of the citizen, focusing mainly on the intellectual and social development of the student), High School (improving the knowledge obtained in elementary school and prepare for the job market) and Higher Education (where the individual seeks professionalization or specialization). Higher Education, then, has the function of approaching the demands of the profession and thus transforming them into skills and competences to be developed by students for better professional quality (de Diretrizes, 1996).

When the evaluation falls on undergraduate courses, the indicators are: Course Concept - CC (in loco evaluation that, as in the Institutional, conceptualizes dimensions of the course) and Preliminary Course Concept - CPC (which brings up information regarding its students, its professors, and a vision of its graduates about the perspectives of the curricular content and expansion of training through it) this, inclusive, considered the most complete of the indicators. Finally, the evaluation of student performance has ENADE as its main source.

ENADE provides HEIs with the opportunity to learn about the profile of their students, the evolution of skills, from freshman to graduate, promoting improvements in the teaching methodologies of the courses, indirectly evaluating the performance of teachers, measuring the best practices of their administrative body in service to the needs of the student, and enabling an improvement in the grade of undergraduate courses informed by the responsible government bodies (da Silva & Ferraz, 2018). On the other hand, ENADE is a limited tool for evaluating undergraduate courses, especially because it is linked only to a specific axis of

SINAES (Polidori et al., 2011), and evaluation instruments that standardize the quality measurement process are essential. of higher education in Brazil (Tavares et al., 2014).

Therefore, when analyzing a course quality indicator such as the CPC, it is expected that those students who had contact with the components of that curriculum follow the qualification of their course, thus translating into the ENADE concept what the course brought as CPC.

The group of Pedagogy courses in Baixada Santista whose ENADE rating was below the regular one grew from 0% to 26.67% and in the same period the group of courses with an ENADE rating higher than the regular one decreased. For the CPC concept, the group of Pedagogy courses that in the first evaluation cycle of this indicator had registered 20.00% of concepts 1 and 2, decreased to 6.67% in the last cycle, while the group of excellence with concepts 4 and 5 went from 10.00% to 46.67%.

5 CONCLUSION

In the analyzed clipping, the Pedagogy courses in Baixada Santista had an increase in bad grades in ENADE and in CPC the increase was reflected in the range of good grades. That is, while Pedagogy courses achieve high rates of concepts related to their courses, the same is reversed when the analysis falls on the graduates of these same courses when performing a content exam. Add to that other variables that concern the Administrative Category, Academic Organization and Teaching Modality.

In this context, the need for further studies is evident in order to assess the effective contribution of quality indicators in the construction of standards of excellence for teacher training and thus achieve and raise the quality of teaching practices in elementary education.

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CHAPTER 15

Nonoperative treatment of liver injury caused by firearm: a case report

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ABSTRACT

Nonoperative treatment (NOT) of blunt liver injury is a widespread practice that has a high success rate (82-100%). Because of this, NOT has been used in cases of penetrating liver injury. However, despite the positive outcomes, the indication of NOT in these cases is controversial. Due to high incidence of associated thoracoabdominal injuries, this treatment modality requires a careful selection of the patient. This report presents a case of a victim of a firearm injury whose projectile was lodged in segment II of the liver, and this injury was managed with NOT, without any liver complications. However, due to its thoracic path to the abdominal cavity, it was necessary to approach the pleural empyema condition, with good evolution, without other associated complications.

Keywords: Wounds, Gunshot, Conservative Treatment, Liver, Case Reports.

1 INTRODUCTION

The liver is the most affected organ in penetrating chest trauma (40% of cases), with stabbing and firearm injuries being the main causes.^{1,2,3} In recent decades, non-operative treatment (NOT) of blunt liver injuries has been widely adopted, currently being used in about 86.3% of cases, and has a significant success rate (82-100%).^{1,4,5}

Currently, due to the good results in the non-operative treatment (NTO) of blunt liver injuries with a significant success rate (82-100%), TNO has been extended to penetrating liver injuries. However, a more rigorous selection is necessary in these cases, given that they may present associated intra-abdominal lesions, which are usually the reasons for the failure of TNO.^{4,6,7}

In this report, we present a patient with a gunshot wound, with a projectile lodged in the liver, which was chosen for TNO, progressing well and without liver complications.

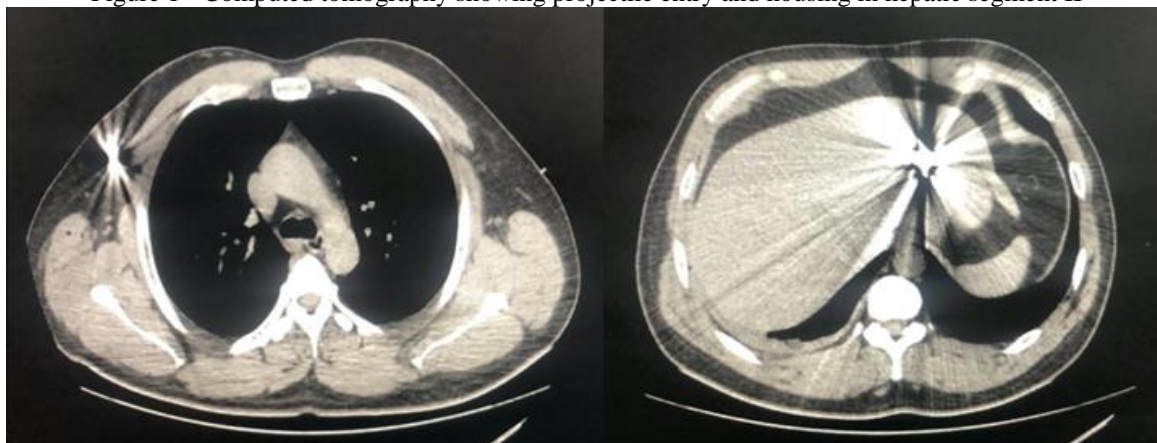
This article was registered under CAAE 45326321.8.0000.5362 and approved by the ethics committee of the proposing institution by opinion No. 4,644,920. The free and informed consent form was obtained on the use of information from the medical record and images by the patient.

2 CASE REPORT

Male patient, 38 years old. Victim of gunshot wound with entry wounds in the arm and right hemithorax and projectiles lodged in the right axillary region and in the liver. He is admitted to the emergency department with a blood pressure of 138/80 mmHg, a heart rate of 56 bpm, and a saturation of 98%. On physical examination, there is no subcutaneous emphysema or decreased chest expansion, only a slight decrease in breath sounds in the right lung base. Examination of the abdomen showed hydro-air sounds present, and the abdomen was painless on deep palpation, with no signs of peritoneal irritation. Expectant management was chosen, and the patient was monitored with strict control of vital signs, laboratory and imaging tests.

The computed tomography result showed a metallic projectile lodged in the hepatic segment II, resulting in a grade 3 hepatic lesion, with an entry path into the right hemithorax, in the seventh intercostal space, and with a trail of metallic splinters in the hepatic domus, where small hypodense foci could be seen. (Figure 1) The second projectile was lodged in subcutaneous tissue in the right axillary/pectoral region, associated with minimal right hydropneumothorax. Patient kept in absolute rest, with no indication for surgical intervention due to hemodynamic stability, opted for monitoring and follow-up with laboratory and imaging tests.

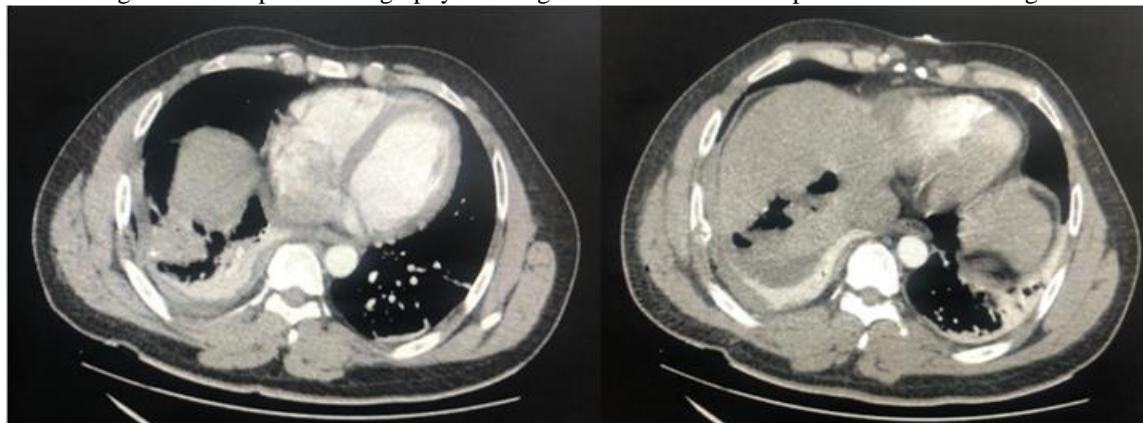
Figure 1 - Computed tomography showing projectile entry and housing in hepatic segment II



On the 2nd day of hospitalization, despite being instructed to maintain absolute rest, the patient left the bed, evolving with pain in the right hypochondrium. He maintained hemodynamic stability in the period. A new contrast-enhanced tomography of the thorax and abdomen was performed, with evidence of a small amount of basal pleural fluid on the right posterior with passive atelectasis and aerated focus in the right lower lobe in the posterior basal segment with a path through the diaphragm to the hepatic parenchyma,

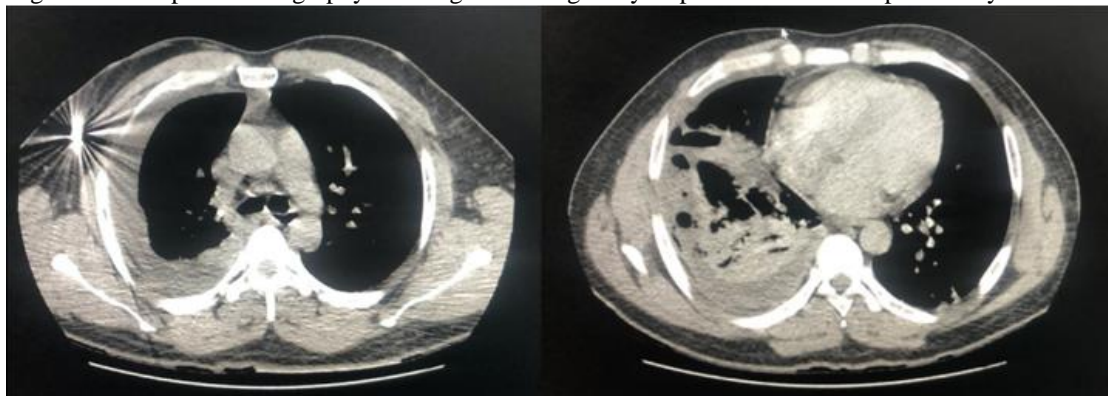
between segments VII and VIII, noting in this topography metallic residues associated with a small amount of subphrenic fluid on the right (Figure 2). Opted in conjunction with thoracic surgery to maintain conservative treatment in an intensive care bed.

Figure 2 - Computed tomography showing a small amount of subphrenic fluid on the right.



On the 4th day of hospitalization, he had a fever peak of 38°C, without changes in the leukogram. Ampicillin + sulbactam was prescribed, and an abdominal US was requested, which showed irregular hyperechogenic foci in the right hepatic lobe, subdiaphragmatic, with signs of hepatomegaly, but without evidence of fluid collection. Still without indication for surgical intervention, he was released for relative rest and discharged from the ICU. One day later, he complained of dyspnea on minor exertion, and a new tomography of the chest and abdomen was requested, which revealed worsening of hydropneumothorax and pulmonary consolidative opacities in the trajectory of the projectile, with intermingled gas bubbles, suggesting pulmonary contusion (Figure 3).

Figure 3 - Computed tomography showing worsening of hydropneumothorax and pulmonary contusion.



A decision was made for operative intervention through videothoracoscopy with evidence of septate empyema. Pulmonary decortication and anterior and posterior right chest drainage were performed, and the drains were removed on the 4th and 5th postoperative days, respectively. The patient evolved well, with a stable condition, being discharged on the 7th postoperative day. However, he returned to the emergency

department the next day with dyspnea and a fever of 39°C. A new tomography was performed and showed an increase in the pleural effusion, septate, suggestive of empyema (Figure 4). We opted for new decortication by thoracotomy and antibiotic therapy with piperacillin + tazobactam.

Figure 4 - Computed tomography suggestive of empyema.



During the second hospitalization, he presented an episode of abdominal pain, performed abdominal ultrasound with Doppler, without changes, and therefore, the follow-up of the TNO of the liver injury was chosen. This complaint improved, but fever peaks remained, and the antibiotic therapy was changed to meropenem, with which the patient showed an improvement in the clinical picture, with good evolution and hospital discharge for outpatient follow-up.

3 DISCUSSION

With the evolution of imaging tests for evaluation and diagnosis, the treatment of liver lesions has also evolved. Today, the management of most liver trauma is performed through TNO. However, the indication of TNO for cases of penetrating liver injury is still controversial, mainly due to the high possibility of other associated abdominal or thoracic injuries. Due to this reason, the selection of patients to undergo NOM should be performed with caution, despite the positive outcomes.^{2,6,7}

Among the benefits of using TNO, we can mention the reduction in the frequency of unnecessary laparotomies, which represent about 30% of all laparotomies for cases of perforating liver trauma, as well as its complications. In addition, the length of hospital stay, the need for blood transfusion and intensive care are lower. As well as mortality, when compared with surgical management. This is due to the fact that most deaths from liver trauma result from surgical complications, such as intraoperative hemorrhage and postoperative sepsis. In those hemodynamically stable patients, bleeding from isolated liver lesions usually

ceases spontaneously, for this reason NOM has high levels of success. Trunkey et al, evaluated 428 patients with perforating liver injury caused by a firearm, and found that 72% of them did not need any treatment during surgery, except for drainage. However, in view of the manipulation of the lesion, there is a possibility of bleeding due to the loss of the clot, which leads to bleeding that is difficult to control with high morbidity and mortality. ^{2,3,6,8}

Despite the many benefits, TNO has increased the incidence of late complications such as persistent hemorrhage, biliary leaks and fistulas, liver necrosis or abscesses, and abdominal compartment syndrome. However, all of these can be treated, if necessary, with interventions via laparotomy or laparoscopy, endoscopic techniques or interventional radiology. These interventions are planned and carried out outside an emergency scenario, and they are not considered a failure in the TNO, but an anticipated eventuality in the management. In addition to those mentioned above, other complications such as hemothorax, empyema, pulmonary contusion and diaphragmatic injury are also observed, and are quite frequent, which was also evidenced as a complication in this case report. ^{1,2,4,6,7.}



Even with positive results in the literature, and in this case explanation, the indication of NOM in penetrating gunshot wounds in the right thoracoabdominal transition should be carefully evaluated. Its use should only be carried out in hospitals with professionals and infrastructure for the correct monitoring of such patients. The hospital in which this patient was treated is a trauma reference in its region and, although it does not yet have its own protocol for these cases, the procedures adopted are based on the guidelines of the SBAIT (Brazilian Society for Integrated Assistance to the Traumatized). Although more studies are needed to disseminate this indication, the option to perform the TNO has been shown to be coherent and with a favorable outcome.

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CHAPTER 16

Dissemination of multi-resistant bacterial strains associated with the community and the hospital: an overview of public health risk

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ABSTRACT

The evolutionary process of microorganisms favors their survival in hygienic environments. Annually thousands of lives are claimed as a result of resistant bacteria, pathogens previously restricted to the hospital environment can now be easily found in the

community. The main objective of the present study is to provide information on the microbiological dissemination pathways in the community, focusing on food and surfaces. The study is a systematic review, in which several studies published in journals originally in the English language were analyzed and evaluated, during the period from 2017 to 2022. In order to select the studies with the greatest scientific evidence, favoring controlled and randomized clinical trials, in addition to systematic and bibliographic reviews. The lack of biosecurity when handling products of animal origin is a major risk to public health, these failures involve not washing hands after handling, using the same container for preparing or storing raw meat to ingest the cooked meat, without due prior cleaning. According to a survey, approximately 90% of the cell phones of health professionals were colonized by some microorganism, where 14% represented pathogenic and infection-causing bacteria. The dissemination of knowledge about hygiene and daily care is fundamental in controlling the transmission and spread of multidrug-resistant microorganisms. This action is capable of saving lives and helping the health system to develop more effective treatments, thus, research in the field of bacteriology is essential to improve academic and community knowledge.

Keywords: Bacterial Resistance, Contamination, Food, Surface.

1 INTRODUCTION

The constant race to find ways to prevent the spread of resistant bacteria is increasing, the spread of resistant genes and strains represents a risk to public health, raising the rates of infections and consequently influencing the fine line of mortality and morbidity. The evolutionary process of microorganisms favors their survival in hygienic environments and provides the selection of resistant strains. The main routes are through direct or indirect contact, aerosols, food and water (PALME-BENGTSSON *et al* , 2018).

Annually thousands of lives are claimed as a result of resistant bacteria, pathogens previously restricted to the hospital environment can now be easily found in the community. Resistance is the pathogen that has the genetic characteristic of surviving a high concentration of antibiotic. The spread of bacteria in the environment or community results in the final colonization of humans, the entire pathway assists in

selection and exerts selective pressure on the bacterial community. The exchange of information between bacteria is facilitated due to the environmental movement carried out by these pathogens (PALME-BENGTSSON *et al* , 2018).

Monitoring and screening the bacterial species present in the community allows the development of a critical eye to recognize when a bacterial population is capable of acquiring resistance to a drug (ELLABAAN *et al* , 2021). Conjugation, a form of sexual reproduction of bacteria, allows the exchange of genetic material and plasmid fragments that are capable of modifying bacterial characteristics, including virulence, biofilm formation and antibiotic resistance (VIROLLE *et al* , 2020).

The environment shared by a high number of people is more likely to present a greater number of resistant bacterial species. Environments such as subways, public restrooms, food areas and so on, are places of socializing and intense bacterial interaction. The interaction between similar or different bacterial species demonstrates a risk, as it increases the chances of the spread of genes that provide resistance to one or more antibiotics (Klasert *et al* , 2021).

The countries with the highest rates of antibiotic consumption also represent the places with the highest numbers of multidrug-resistant bacteria. The arrival of these pathogens in the community is the result of incorrect use of antibiotics, failure in biosafety protocols and genetic alterations. The formation of biofilms also favors bacterial propagation and survival both in hospital and community settings (MARTINA *et al* , 2019).

The bacteria previously restricted to the hospital environment, are now also found in the community. The escape of these microorganisms to the general population is a result of the traffic of patients hospitalized or treated at the units, as well as the failure of hospital biosafety practices among health professionals. Another factor is the genetic mutation in bacteria already associated with the community, making them resistant to antimicrobials. Hands are one of the main means of transport for these microorganisms (MARTINA *et al* , 2019).

Human skin contains its own microbiota, where some sites are more susceptible to transmission and colonization. However, the specific microbiota or flora of each patient undergoes changes over the course of a few days inside the hospital, and colonization by multidrug-resistant pathogens is possible. In view of this, hospitals, clinical and laboratory environments must contain policies and measures for the prevention and control of infection. These measures require training of professionals regarding biosecurity, adequate infrastructure, patient/visitor awareness and PPE supplies as tools to prevent and minimize the spread of microorganisms (STRICH; PALMORE, 2017).

The use of antibiotics has contributed to a dramatic reduction in morbidity and mortality due to infectious diseases worldwide. Global antibiotic consumption increased by 65% between 2000 and 2015 worldwide, which is inversely correlated with decreasing deaths from infectious diseases. The massive use of antibiotics has also led to the selection of resistant bacterial strains (OUMOU *et al* , 2020).

Data on the frequency of nosocomial infections (NI) and antibiotic use are important indicators of quality, and the growing problem of antibiotic resistance has important consequences: it reduces treatment options for infected patients and results in morbidity, mortality, and costs. additional. Rational use of antibiotics can reduce the selective pressure for the development of antibiotic resistance (BEHNKE *et al* , 2017).

The main objective of the present study is to provide information on the routes of microbiological dissemination in the community, focusing on food and surfaces and in the hospital environment. In addition to presenting an overview of the risks of contamination in the community and potential infections, showing the serious situation in relation to public health. Emphasizing the danger represented by the presence of multidrug-resistant bacteria in the community as well as reporting the incidence of infections related to the hospital service. The systematic review demonstrates the importance of disseminating microbiological knowledge about contamination in civilization, preventing recurrences of infections, transmission of pathologies and resistant bacterial species.

2 METHODOLOGY

The study is a systematic review, in which several studies published in journals originally in English were analyzed and evaluated, during the period from 2017 to 2022. The databases used as reference were MEDLINE, PubMed , BVSalud and ScienceDirect . In order to select the studies with the greatest scientific evidence, favoring controlled and randomized clinical trials, in addition to systematic and bibliographic reviews. The search used the following keyword combinations: *Bacterial Resistance; Hospital ; Food; surface* . To identify the study designs, the following terms were used: *Bacterial resistance ; Hospital; Food; Surfaces*.

The terms were attached to the respective platforms individually and then together with the Boolean operator *and* . The inclusion and exclusion criteria were applied following the inclusion basis between the period from 2017 to 2022. With an emphasis on controlled, randomized clinical studies, systematic and bibliographic reviews.

3 THEORETICAL FRAMEWORK

3.1.1 Contamination of food by resistant bacteria

Multidrug-resistant bacteria represent a great risk to public health, since they have the ability to resist several antibiotics. Bacterial infections are denoted in all countries, being one of the main causes of community-acquired infections. An example to consider is methicillin - resistant *Staphylococcus aureus* (MRSA) which can be found colonizing objects, surfaces, human skin, food and public places. Food is essential for human survival, however, it also acts as a potential vector (RODRÍGUEZ *et al* , 2019).

Contamination can occur during food handling, favoring product and handler contamination. Contact with the skin, meat, secretions and other exudates of slaughtered animals poses a major risk of

MRSA contamination associated with livestock. Ingestion of contaminated food can result in severe intestinal infections, extra-intestinal infection and transmission (RODRÍGUEZ *et al* , 2019).

The lack of biosecurity when handling products of animal origin is a great risk to public health, these failures involve not washing hands after handling, using the same container for preparing or storing raw meat to ingest the cooked meat, without due prior cleaning. Another mistake is to use the same board for preparing raw meats for preparing ready-to-eat foods, such as vegetables, fruits and vegetables. These flaws favor cross-contamination by pathogenic species of bacteria (RODRÍGUEZ *et al* , 2019).

The spread of resistant bacteria between foods, whether raw or ready-to-eat, results in an increase in serious intestinal infections. Cross-contamination by MRSA or other pathogens acts indirectly and recurrently, through recontamination (RODRÍGUEZ *et al* , 2019).

In cross-contamination (indirect) the transfer of bacteria from a contaminated food to an uncontaminated product is observed, through manipulation or utensils, while in recontamination , food contamination is observed after its preparation and potential inactivation of microorganisms. Careless handling of these foods also results in contamination of the handler, which in turn may act as a vector in the propagation of these bacteria in other environments (RODRÍGUEZ *et al* , 2019).

Food preparation must be careful, failures such as not washing hands before, during and after handling the product help in the vector transmission of microorganisms; The use of the same kitchen appliances and objects for raw meats and ready-to-eat foods; Ineffective cleaning of the utensils used. This view highlights that the actions taken in the preparation of food products are directly related to bacterial transfer and the high number of recurrent gastrointestinal infections. Mishandling and faulty food, whether contaminated or not, can lead to greater consumer exposure to resistant microorganisms (RODRÍGUEZ *et al* , 2019).

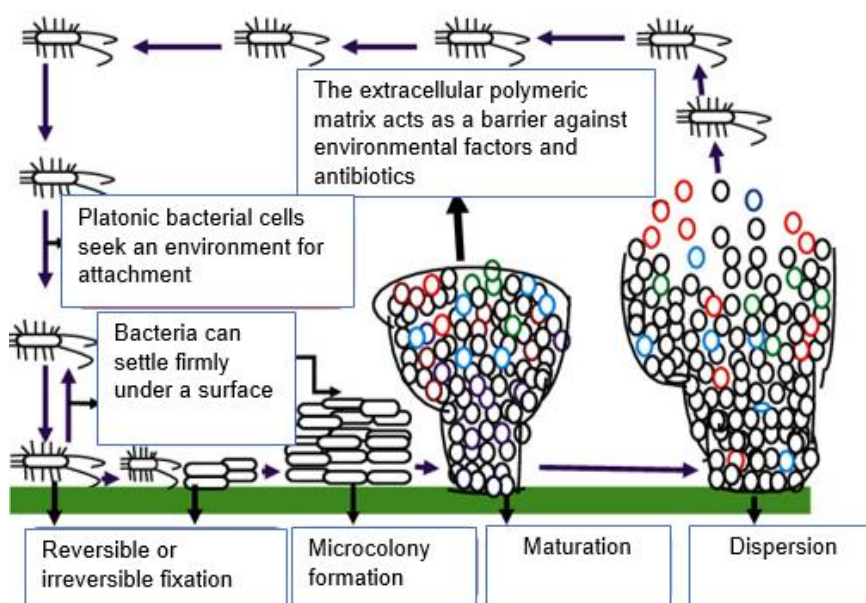
Contamination of food with bacteria results in approximately 600 million sick people annually. The contaminating process can occur during food production, distribution, storage and consumer handling. Biofilm formation is a serious problem when observed in food and collective environments, this bacterial community is able to develop on biotic and abiotic surfaces (ABEBE, 2020).

Pathogenic microorganisms are able to colonize, proliferate and form a biofilm on the surface of food products, increasing the risk of infections and food poisoning. Ineffective cleaning practices allow the survival of microorganisms and particles that aid in the colonization process. The biofilm (Figure 1) acts as a protective base for adhered microorganisms, being resistant, persistent and insensitive to hygiene chemicals (ABEBE, 2020).

Multi-resistant antibiotic-resistant pathogens adhered to a biofilm matrix become resistant to adverse and extreme environmental conditions, thus infectious processes are more difficult to regress in antibiotic therapy. It is estimated that 80% of chronic infections are related to the presence of biofilm (ABEBE, 2020).

Bacterial cells inserted in the biofilm are found in a high proximity to each other, this proximity facilitates communication between them through chemical signals, favoring the response to environmental stimuli. The formation of the protective capsule increases resistance, restricting drug entry; action of enzymes that inhibit the drug; alteration of bacterial metabolism; use of efflux pumps. The environment in the biofilm allows for a higher rate of genetic mutations, favoring the formation of inactivating enzymes . In addition, within the community, there is a horizontal transfer of plasmids and genes that encode resistance to new antibiotics between one cell and another (ABEBE, 2020).

Figure 1. Biofilm formation process



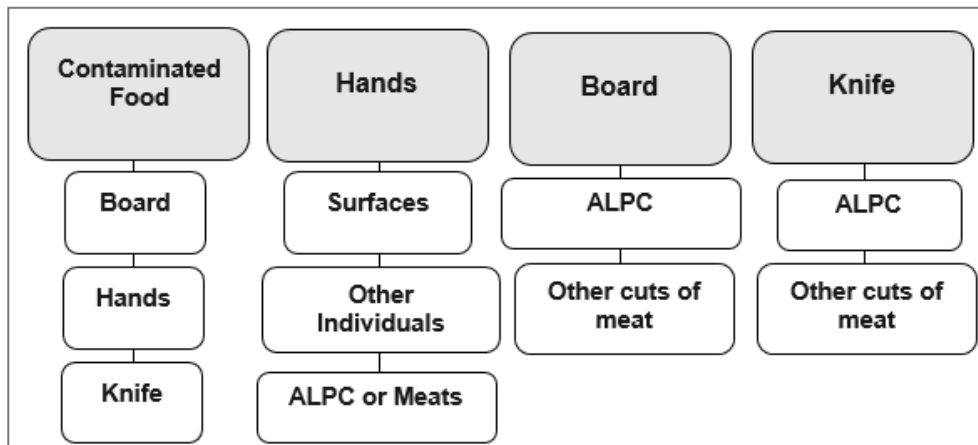
Source: Adapted from ABEBE, 2020.

The constant circulation of these pathogens directly affect human health and lifestyle. The fixation of the biofilm on food products or production equipment is worrying, as it becomes a reservoir of contamination (ABEBE, 2020).

Bacteria present on the surface of the food may migrate to the interior of the meat during the slicing performed by the consumer, this fact must be taken into account since the bacteria present inside the meat will face a different heat regime from those on the surface. The knife contaminated with the microorganism may act as a vector of dissemination by transferring these pathogens to other successive cuts of meat (IULIETTO & EVERS, 2020).

Route lines for cross-contamination can occur from contaminated hand food; from the food to the cutting board; from food to knife and other possibilities (Figure 2). The contamination cycle can reach any surface and generate a greater spread (IULIETTO & EVERS, 2020).

Figure 2. Schematic of the main routes of cross-contamination in the home



Source: Personal archive, 2022. Caption: Ready-to-eat foods (ALPC).

Contaminated hands can help spread resistant bacteria to surfaces or objects that can be colonized and serve as a reservoir of contamination. Contamination of the environment with these pathogens increases the possibility of contamination, where the contaminated surface will have direct contact with several individuals, favoring the route of hand-to-mouth contamination (IULIETTO & EVERS, 2020).

A survey evaluated 201 samples of sandwiches prepared in public food establishments, so that 36 of the samples were contaminated with *Salmonella sp.*, characterization revealed the presence of 16 different serotypes capable of causing serious food infections in humans and animals. The 36 positive samples were submitted to antimicrobial susceptibility analysis, where six showed resistance to four or more antibiotics, revealing a multi-resistance (NIKIEMA *et al*, 2021).

It is notable that there are several means of transport for microbiological contamination, such as surfaces, food, hands, cell phones and other shareable devices. Bacterial transit between environments is a risk for immunosuppressed or immunocompromised people, increasing cases of community-associated infections. Most bacterial infections present with resistance to one or more antibiotics, compromising treatment (MARTENA *et al*, 2019).

3.1.2 Contamination of surfaces, objects and hands

The lack of awareness spreads the false knowledge that microorganisms only exist in places with poor hygiene. However, one of the main vehicles of transmission of bacteria is the hands, where the habit of washing and hygiene is often careless, helping the spread of pathogens. Transmission can occur directly, that is, skin-to-skin, or indirectly, through inanimate means such as money, telephone, surfaces and food (MARTINA *et al*, 2019).

According to a survey, approximately 90% of the cell phones of healthcare professionals were colonized by some microorganism, of which 14% represented pathogenic and infection-causing bacteria. As a device for personal use, cell phones transport bacteria from one environment to another, especially when biosecurity standards are not applied (MARTINA *et al*, 2019).

A study evaluated the contamination present in the hands of 538 volunteers, of these 531 tested positive for contamination with bacteria. In addition, the analysis of cell phones was performed, so that 238 of the 256 cell phones were contaminated by pathogenic bacteria. The antimicrobial susceptibility showed that most of the bacterial species identified had some type of resistance to one or more drugs. The study results suggest that cell phones represent one of the main vehicles for the dissemination of resistant bacteria in the community. Hand hygiene is effective in controlling bacterial colonization (MARTINA *et al* , 2019).

Bacteria are able to survive in the most different environments, contaminated surfaces act as a contaminating store which many people come into contact with daily, easily acquiring these pathogens. Hands can transmit infectious bacteria to yourself or to other people and environments (MOMANI *et al* , 2019).

A survey carried out with university students verified the presence of contamination on individual hands and cell phones. Of the 220 samples, eight bacterial species were identified and isolated: *Staphylococcus epidermidis* , *Streptococcus pneumoniae* , *Staphylococcus aureus* , *Streptococcus pyogenes* , *Enterococcus faecalis* , *Bacillus cereus* , *Micrococcus ssp* and *Escherichia coli*. In summary, 41% of hands were contaminated with one or more of the aforementioned pathogens and 18% of phones had positive growth. The species showed high resistance to the tested antimicrobials, generating a public health alert (MOMANI *et al* , 2019).

The greater the handling or contact of a piece of equipment, surface or object with several people, the greater the rates of colonization of the product by resistant bacteria. This sharing and lack of hygiene results in the spread of different microorganisms among users (ROZARIO *et al* , 2020).

Contamination of environments is a serious problem as it helps in the spread of resistant strains in the community, surfaces are areas with easy colonization, acting as a reservoir for multiresistant bacteria, in addition to facilitating the spread by contact with the hands. Horizontal transmission can happen quickly when repeated people touch the same surface (OH *et al* , 2021).

In everyday life, contact categories can be divided into items used exclusively by the individual, items used especially by the individual, but shared with others on some occasions and items of general or public use. Items such as furniture, doorknobs and other general contact surfaces represent a higher concentration of resistant bacteria compared to individual items. However, these categories can suffer from cross-contamination through direct contact and a vector, the hands. In this way, the need to apply strict hygiene practices to avoid the transmission of potentially infectious pathogens is highlighted, these measures must be regular especially in public places (OH *et al* , 2021).

An example is the currency of exchange, that is, money. Money acts as a potential vector in the transmission of bacteria between people, as it is passed from hand to hand. One way to avoid contamination of individuals and other individuals would be the application of hand hygiene after handling money (OH *et al* , 2021).

The skin provides protection against several pathogens harmful to human health, however, it also has several commensal and pathogenic microorganisms on its surface. Microorganisms colonizing the epidermis can spread through direct contact or by desquamation. The cycle of epidermal dissemination occurs between individuals who live together or frequent the same environment, consequently environmental contamination also plays a role as a vector of resistant pathogens (BAQUERO *et al* , 2021).

The whole scenario of bacterial dissemination and the growing phenomenon of multidrug resistant, characterizes a worrisome world canary. Therapeutic options are weakened daily. Population awareness about the importance of hygiene and the human role in the spread of these microorganisms is fundamental to reduce the rates of serious gastrointestinal, epithelial and systemic infections in the community (BAQUERO *et al* , 2021).

The controlled and conscious use of antimicrobials is essential for the control of pathogens resistant to several drugs, exerting control over the selective pressure suffered by the unconscious use of antibiotics and maintaining the hygiene of environments and hands, are ways to circumvent the growing increase of these pathogenic pathogens in the community (BAQUERO *et al* , 2021).

3.1.3 Hospital contamination

The increase in healthcare-associated infections is a reflection of a heterogeneous chain of factors, including the lack of biosecurity among the various professionals who provide patient care (BAYRAKTAR, M *et al* , 2021). The hospital environment has several means for the propagation of multidrug-resistant bacterial strains. High and low contact surfaces can be potential targets for contamination by bacteria, the contact of health professionals with these surfaces and the neglect of biosafety favors nosocomial transmission to patients with possible serious conditions (FRICKMANN *et al* , 2018).

A qualitative study carried out in 2017 evaluated the presence of multidrug resistant bacteria on low and high contact surfaces, and in the hands of health professionals, noting that all samples were contaminated with a multidrug resistant pathogen, such as *S. aureus* , *Streptococcus spp* , *Bacillus spp* , *Lactococcus spp* , *Micrococcus spp* , *Corynebacterium spp* , *Enterobacteriaceae* and *Enterococcus spp* . The surfaces verified as contaminated in the study went through the disinfection process and subsequent analysis, demonstrating that although the disinfection kept the colonies under control, the microorganisms did not disappear completely, emphasizing the importance of correct hygiene of the hands of health professionals and patients before and after treatment. after contact (FRICKMANN *et al* , 2018).

Analyzes and observations of biosafety failures, violations and errors are alarming, involving entry into patient rooms with isolation notice without some or all of personal protective equipment (PPE), errors in the sequence of PPE removal, touching areas of the body or objects with contaminated gloves or aprons. Despite seeming simple or unimportant failures, each of these can result in contamination of surfaces, patients, self -contamination or other health professionals (KREIN *et al* , 2018).

The observations carried out in the hospital environment were able to identify the main mistakes made by health professionals during patient care, favoring the spread of multidrug-resistant bacterial strains. The need for attention to biosafety standards must be individual and collective, care and precautions must be taken both with potentially infected patients with contact precautions, droplets or contact enteric, and with potentially contaminated patients (KREIN *et al* , 2018).

A study carried out from the observation of 479 interactions between patients and health professionals showed that about 71 or 15% of these interactions resulted in contamination (glove, lab coat and objects) of the professional by the VRE. Thus, it was concluded that the higher the bacterial load, the greater the chances of contamination of the professionals' PPE , turning them into a strong source of transmission (JACKSON *et al* , 2018).

The dissemination routes of multidrug-resistant microorganisms in the hospital environment occurs mainly through patient contact with the environment, surfaces or colonized objects; contact of the infected/contaminated patient with the environment, surfaces or objects; contact of the health professional with the environment, surfaces or colonized objects; contact of the health professional contaminated with the environment, surfaces or objects; contact of the contaminated health professional with the patient; contact of the health professional with a contaminated/infected patient. The illustration below summarizes the main routes of transmission of microorganisms, where number 1 shows the route of transmission from the infected or contaminated patient to the health professional (PFS) and the environment; in route 2, the contagion occurs from the contaminated environment to the health professional and patient and in route 3, the transmission route from the contaminated professional to the patient and environment is observed. (BLANCO *et al* , 2020).

Surveillance in the hospital environment is essential and can lead to a reduction in the number of nosocomial infections. Surveillance, control and prevention (1) enables constant observation and facilitates early warning of outbreaks, (2) constant training and feedback for employees and health workers, encourage them to improve and improve their performance with Regarding infection control and surveillance, (3) the programs train staff to find potential risk or protective factors for fighting nosocomial infections (LI *et al* , 2017).

4 RESULTS AND DISCUSSIONS

4.1.1 Food safety

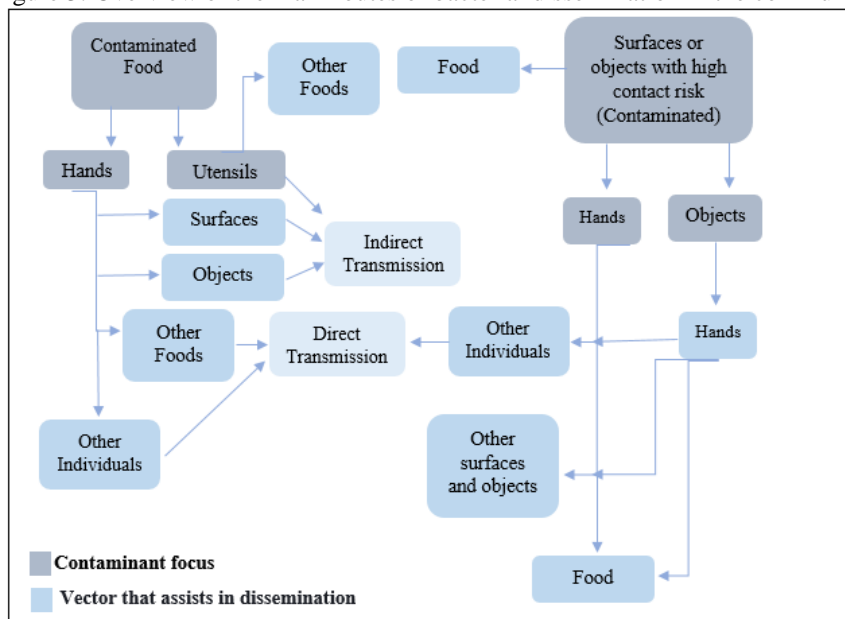
Food security is an essential phenomenon for public health, as it represents economic, physical and social access to quality and safe food. The lack of socioeconomic resources puts pressure on the consumption of foods that are not nutritious and without health monitoring, putting population health at risk. Food safety acts in the handling, preparation and storage of food products in order to prevent foodborne pathologies (BANKEFA *et al* , 2021).

Foods as carriers of bacteria and other microorganisms need parameters to define the origin, labeling, the quality of local and product hygiene, government guidelines and others. Compliance with these parameters guarantees a reduction in the risk of food poisoning and microbiological dissemination. Bacteria are the main pathogens responsible for the risk within food safety, causing poisoning. According to a survey carried out by the World Health Organization (WHO) in 2020, approximately 600 million people fall ill with foodborne pathologies, with 230,000 deaths being reported, increasing the need for care in food surveillance (BANKEFA *et al* , 2021).

Currently, there is a great concern about the hygiene of food and environments. The incidence of community-related bacterial infections is increasing and represents a rich real for public health. Bacterial resistance has been a barrier in the application of effective therapeutic measures, the number of annual recurrent deaths from infections caused by bacteria is shocking. Surface contamination allows the transmission of pathological pathogens not only to one individual, but several, fulfilling its role as a contamination reservoir (TROPEA, 2021).

Bacterial dissemination routes (Figure 3) when known prevent contamination and help with cleaning. The different routes used for bacterial dissemination harm and jeopardize the food and physical security of the population. It is essential to pass on basic knowledge of microbiology to the population, this action allows the formation and improvement of individual conscience, where it will encourage the practices of personal and environmental hygiene. This action, applied globally, can reduce or control cross-contamination and bacterial interactions, consequently, a drop in the bacterial resistance index can be observed in different species, making the race in the production of new antimicrobials fairer (TROPEA, 2021).

Figure 3. Overview of the main routes of bacterial dissemination in the community



Caption: Contaminant foci act as reservoirs for microorganisms, especially bacteria adapted to the environment. Vectors are responsible for assisting in the dissemination of microorganisms within the community, carrying out a direct or indirect transmission. Source: Personal archive, 2022.

4.1.2 Hospital infections and biosecurity

The increasing number of nosocomial infections associated with health care encompasses not only a public health concern, but also demands a greater economic burden due to its greater severity and use of resources. Patients infected with a multidrug-resistant pathogen face longer stays in hospitals/ICUs, which consequently increases hospital costs with the use of antimicrobial therapy. Thus, the development of research becomes fundamental for the discovery and improvement of efficient methods and treatments against nosocomial infections, as well as for the creation of new means to control the spread of multidrug-resistant bacterial strains (CERCEO *et al* , 2016).

Although there is a visible sense of urgency and attention in many countries in controlling the spread of multidrug-resistant microorganisms, methicillin-resistant *Staphylococcus aureus* remains one of the main pathogens present in hospital-acquired infections . In addition to MRSA, bacteria such as multidrug-resistant *Escherichia coli* and carbapenem -resistant *Enterobacteriaceae* also pose a public health problem.

Healthcare professionals must play an important role in infection control. Hand decontamination is required with suitable hand sanitizers after contact with infected patients. Safe injection practices and sterile equipment are critical. The use of masks, gloves, headgear or appropriate uniform is essential for the provision of health care (KHAN, 2018).

Several hospitals adopt biosecurity measures, including precautions for contact with patients who are confirmed or suspected to be infected. During the care of these patients, it should be mandatory to use personal protective equipment or PPE, avoid the use of personal objects such as cell phones and not touch the face or clothes with gloved hands, among other precautions (JAIN *et al* , 2018).

These standard precautions for the control of infectious outbreaks reduce the likelihood of contamination of the healthcare professional and the consequent transmission to other hospital beds and environments. The main objective of personal protective material is to reduce the chances of contamination and transmission of pathogens that can put the lives of patients at risk, however, the neglect of the correct use of these equipment favors the increasing number of infections associated with the hospital (JAIN *et al* . , 2018).

5 CONCLUSION

The high number of infections reported annually portrays a worrying picture for public health, since it represents a high value of investment and expenses in treatments. Bacterial dissemination in the community is increasing, extremely pathogenic species are easily found in the community environment and reaching immunosuppressed or immunocompetent patients, resulting in alarming deaths and chronic infections.

The lack of hygiene of food, hands and environment characterizes the main means for bacterial dissemination, since they act as vehicles of locomotion. Bacterial interaction allows the exchange of valuable genetic information to increase bacterial resistance, this scenario is worrisome from the

perspective of antibiotic therapy, as available antibiotics become increasingly insensitive to these pathogens. The result is the severe picture of numerous community-associated bacterial infections.

The dissemination of knowledge about hygiene and daily care is fundamental in controlling the transmission and spread of multidrug-resistant microorganisms. This action is capable of saving lives and helping the health system to develop more effective treatments, thus, research in the field of bacteriology is essential to improve academic and community knowledge.

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CHAPTER 17

Disease knowledge and preferences for disclosure of information in patients with rheumatoid arthritis

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ABSTRACT

Objectives: To verify the level of knowledge about rheumatoid arthritis (RA) and the patient's preferences for disclosure of information by the physician in patients with RA, we compared with a control group of patients without RA.

Methods: We evaluated 30 patients diagnosed with RA, according to the ACR criteria, and 30 patients with other diseases paired for age, gender, level of education, and disease duration followed in an Out-Patient Service. Clinical-demographic data as age,

gender, level of education, and disease duration were obtained from both groups. We applied questionnaires to evaluate the level of knowledge about RA (10 questions) with answers yes or no, and the patient's preference for disclosure of information by the physician (4 questions) in a Likert scale from a) strongly agree to e) strongly disagree to both groups. The questionnaires were validated for Portuguese by the method of translation and re-translation. The Ethical Committee at the Pontifical Catholic University approved the study, and we obtained informed consent from all patients. When appropriated, statistical analysis of the data included the chi-square test and student's t-test. The significance level was 0.05.

Results: Over 30 patients with RA, 27 patients (90%) were women, the mean age was 50.8 years old, with a mean of 3.03 years on school, and mean disease duration of 10.6 years. The knowledge about RA as a mean reached 5.36 points in 10 as a correct answer in RA patients and 5.13 in controls. Concerning the patient's preference for disclosure of information by the physician, the results varied between 23.3% and 90% in the answers strongly agree or agree in the group of RA patients and 6.6% to 90% in controls. In a specific question about "*patients with RA should not play a role in managing their disease because the physician is the one in charge,*" 56.6% of RA patients agreed, and 46.6% of controls too. Only one question about patient's preference for disclosure of information by the physician "*When there is more than one way to treat a problem, I should be told about each one*" there was a trend to differ between the controls and the RA patients ($p=0.06$). The analysis of the results showed no statistical difference in answers to the questionnaires between RA patients and controls. **Conclusion:** Our results showed that RA patients, compared to control patients with other non-rheumatic diseases, do not show differences to the level of knowledge about rheumatoid arthritis (RA) and the patient's preferences for disclosure of information by the physician.

Keywords: rheumatoid arthritis, disclosure of information, knowledge of disease.

1 INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, systemic, autoimmune, and inflammatory disease characterized by the involvement of multiple joints with their destruction and consequent mechanical and physical disability. In this context, the health education of RA patients is essential to the psychic well-being of patients and to increase adherence to the treatment and allow the patient to participate in the treatment decisions that minimize the impact of the disease. Patient knowledge about the disease, particularly in RA, is an essential element of treatment, allowing the patients with RA to take care of themselves and make decisions about their health (1). It depends on how much the disease will change their lives and how to cope with important aspects of the disease. In relation to the disease activity, patient knowledge and education about their disease have no benefit about this aspect of the disease (2). In a study in Hospital care, only 1.5% of patients with RA were considered aware of their condition when questioned about symptoms, possible complications, and RA treatment (3). An essential aspect of medical patient communication is the disclosure of treatment-related risks and how much information has to be disclosed to the patient about their disease. Studies have demonstrated that well-informed patients do not have an increase in the frequency of adverse effects of medication or an increase in the level of anxiety in well-informed patients compared with controls (4,5). An extensive discussion about the varied treatment options currently available for RA is critical today in the care of rheumatic patients. This study will verify the level of knowledge about rheumatoid arthritis (RA) and the patient's preferences for disclosure of information by the physician in patients with RA compared with a control group of patients without RA.

2 METHODS

We interviewed and analyzed a sample of 30 patients diagnosed with RA, according to the ACR classification criteria (6), and 30 patients as the control group with other non-rheumatic diseases like arterial hypertension (50% of patients), diabetes mellitus (30%) and other diseases (20%). They were in clinical follow-up at the Rheumatology Out-patient Service of the Sorocaba Hospital/Pontifical Catholic University of Sao Paulo (PUC/SP). Both groups we paired for age, gender, level of education, and disease duration. The Ethical Committee of the PUC/SP approved the study, and we obtained informed consent from all patients. We collect clinical and demographic data such as gender, age, years at school, and disease duration from both groups. We applied two questionnaires to both groups to evaluate the level of knowledge about RA (10 questions) with the answer yes or no; and the patient's preference for disclosure of information by the physician (4 questions) in a Likert scale from: a) strongly agree; b) agree; c) neither agree nor disagree; d) disagree; e) strongly disagree. The questionnaires were validated for Portuguese by the method of translation and re-translation. The level of knowledge about RA we obtained with the following questions: 1) There is only a single therapy for all RA patients; 2) All RA patients have a bad prognosis; 3) The neck is the most commonly affected area of the spine in patients with RA; 4) RA is caused by cold weather, inadequate nourishment and humidity; 5) Patients with RA should not play a role in the management of

their disease because the physician is the one in charge; 6) RA and osteoporosis are the same disease; 7) RA can produce dryness in the eyes and mouth; 8) Patients with RA should include all kinds of food in their meals but must avoid meat; 9) RA never compromises the lungs; 10) To confirm the diagnosis of RA, it is necessary to perform some blood tests. We considered a positive result on knowledge of RA as five or more right answers in 10 questions (7). The patient's preferences for disclosure of information we obtained with the following questions: 1) Even if the news is bad I should be well informed; 2) It is important for me to know all the side effects of my medications; 3) When there is more than one way to treat a problem, I should be told about each one; 4) I should be given information only when I ask for it. Each question of disclosure preferences was evaluated apart (8). When appropriated, statistical analysis of the data included the chi-square test and student's t-test. The significance level was 0.05.

3 RESULTS

Over 30 patients with RA 27 patients (90%) were women, the mean age was 50.8 years old, with a mean of 3.03 years at school, and mean disease duration of 10.6 years. We observed no statistical difference in these items between RA and control patients and both groups for these variables. The knowledge about RA reached a mean of 5.36 points in RA patients and 5.13 in controls ($p=0.48$). Question 5, "*Patients with RA should not play a role in the management of their disease because the physician is the one in charge,*" has 56.6% of yes for RA patients and 46.6% in the control group ($p=0.79$). As a whole, in the level of knowledge of RA, both groups do not show a difference ($p=0.48$). About the patient's preference for disclosure of information by the physician, the results varied between 23.3% and 90% on strongly agree or agree (a+b) in RA patients and 6.6% to 90% (a+b) in controls. In a specific question, number 3, about "*When there is more than one way to treat a problem, I should be told about each one,*" 83.3% of RA patients strongly agree or agree, and 73.3% of controls too. Only in question number 3, was there a trend to statistical difference from the controls and the RA patients ($p=0.06$). Question number 4, "*When there is more than one way to treat a problem, I should be told about each one,*" has a low agreement (a+b) with 23.3% of the a+b in RA patients and a less agreement in the control group with 6.6% of the a+b. Table 1 below shows the analysis of demographic and clinical data and the statistical data from the level of knowledge about RA and the patient's preferences for disclosure of information by the physician in patients with RA and controls.

Table 1. Analysis of clinical and demographic features and level of knowledge about rheumatoid arthritis (RA) and the patient's preferences for disclosure of information by the physician in patients with RA compared with a control group of patients without RA

	Rheumatoid Arthritis	Control Patients	Statistical analysis
Age, years	50.8	53.3	p= 0.74
Gender, % women	90	86.6	p= 0.68
Disease duration, years	10.6	13.7	p= 0.65
Education, years at school	3.3	5.6	p= 0.11
Disease knowledge, number of right answers	5.36	5.13	p= 0.48
Preferences of disclosure, Q question, % patients			
Q1	86.6	90	p= 0.65
Q2	90	76.6	p= 0.56
Q3	83.3	73.3	p= 0.06
Q4	23.3	6.6	p= 0.17

Values are expressed as mean

The analysis of the results showed no statistical difference in answers to the questionnaires between RA patients and controls.

4 DISCUSSION

In this study of disease knowledge about RA and patients' preferences of disclosure of information by the physician, we applied questionnaires to evaluate these topics to RA patients and controls. The knowledge level, considered good with more than 50% correct answer, showed no difference between RA and controls. Age, gender, level of education, and disease duration were the same in both groups and did not interfere in patients' answers regarding disease knowledge or preferences of disclosure of information. The specific question about the patient's involvement in the management of their disease surprisingly showed that more than 50% of RA patients considered that they should not be involved in the management of their disease. The RA knowledge level in RA patients and controls does not differ. Maybe it demonstrates that only having the disease does not increase their knowledge of their disease in the patient.

Regarding patients' preferences of disclosure of information by the physician, both RA patients and controls did not show a difference in the four questions proposed. In a specific question about treatment choices, there is a trend in RA patients to consider being informed about the various treatment options than in the control group. As a whole, there was no difference in answers to the questionnaires between RA patients and control patients. As Pytel & Wrzosek (1) described, people with higher education were more interested in obtaining information about RA, and women had more knowledge about RA than men. In this

study, the patients' primary disease knowledge source came from physicians, physiotherapists, or nurses. Another study by Pérez S *et al.* (9) showed that RA patients were very interested in knowing about RA, and high functional impairment increased this educational need. The rheumatologist is the primary source of information for the patients. The question about the role of education in RA disease in the outcome of the RA patients is controversial. No significant differences were found in radiographic changes and quality of life (10).

Nonetheless, better disease control of RA may be achieved by improving patient knowledge of the disease (11). The need for information and decision-making was higher in women than in men and younger age, and greater knowledge of RA predicted a greater need for decision-making. However, the desire for involvement in treatment decision-making was significantly lower and did not correlate with the need for information (12). Our study has limitations, and caveats about the number of patients studied and be a transversal study. Future studies need to confirm our findings and improve the understanding of disease knowledge about RA and patients' preferences of disclosure of information by the physician.

5 CONCLUSIONS

Our results showed that RA patients, compared to control patients with other non-rheumatic diseases, do not show differences in the level of knowledge about rheumatoid arthritis (RA) and the patient's preferences for disclosure of information by the physician.

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CHAPTER 18

The utilizations of *in vivo*, *in vitro* and *in silico* tests in ecotoxicological studies: a narrative review

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ABSTRACT

With increasing demand for chemicals, the environment is increasingly exposed to toxic substances. To assess these exposures, ecotoxicological studies appear as an important tool. Tests for evaluations can be divided into *in vivo*, *in vitro* and *in silico*. The *in vivo* one differs from the others, as it uses living organisms in experimentation. The use of living organisms in research is an issue that has been discussed for a long

time. There is a consensus among researchers on the importance of applying the 3Rs principles (reduction, substitution and refinement). Knowing this, the objective of the review is to evaluate the literature regarding the use of *in vivo* studies, emphasizing the relationship between model and non-model organisms for ecotoxicological studies, within the context of alternative tools such as *in vitro* and *in silico* assays. The review highlighted the increase in ecotoxicological studies in recent years and the importance of these studies for the assessment of environmental impacts. *Daphnia magna* is the most used invertebrate model organism in studies, while *Danio rerio* represents the most used vertebrate organism. The *in vitro* and *in silico* tests showed a large number of works carried out, which shows the importance of these tools, especially considering the application of the 3Rs. However, the work brought the importance of understanding which organism is being used in the study and how they vary within the different approaches.

Keywords: Ecotoxicology, 3Rs Principles, Model organism, Environmental impacts, Pollution.

1 INTRODUCTION

With the increase in urbanization and modifications promoted by the human population in recent years, environments are increasingly exposed to substances that may have toxic effects on organisms (Moraes, 2002; Jillella et al., 2021). According to Mucelin (2008), population growth and the consequent increase in activities, such as industry and agribusiness, generate environmental changes. Therefore, it is essential to evaluate environmental impacts through ecotoxicological studies, which are performed in order to identify potential damage to the environment (Almeida et al., 2017).

Ecotoxicological studies make it possible to identify the negative physiological and morphological effects of chemicals present in the air, water, soil and sediment, in contact with living beings (Walker, 2005; Silva et al., 2015). Besides allowing the evaluation of ecosystems already strongly affected, ecotoxicological tests are also useful to alert impacts in early stages that may have even more damaging effects in the long term (Zagatto, 2008).

For the development of ecotoxicological studies, tests with different methodological approaches can be applied, such as *in vivo*, *in vitro* and *in silico* tests. In *in vivo* tests, living organisms, usually model

organisms, are used to conduct ecotoxicological studies. Model organisms are non-human individuals used in research that generate information that can be expanded and applied to other more complex organisms, such as humans (Leonelli & Ankeny, 2013). In addition, experimental models have some advantages, such as easy cultivation and the possibility of using a large number in the laboratory (Ankeny & Leonelli, 2011). According to US National Institute of Health (2018) examples of model organisms are the fruit fly *Drosophila melanogaster*, the plant *Arabidopsis thaliana* and the zebra fish *Danio rerio*.

Despite the widespread use of *in vivo* tests, the use of animals in scientific research is the subject of bioethical discussions (Silva et al., 2015). This debate is mainly brought by activists who criticize the use of animals in studies and ask for alternative methods to replace their use (Morales, 2008). In this regard, in order to reduce discomfort, pain and the number of animals used in scientific research, the 3Rs principle (reduction, replacement and refinement) was created (Cazarin et al., 2004). This program aims to promote greater applicability of *in vitro* (Petroianu, 1996; Cruz & Angelis, 2012) and *in silico* (Victal et al., 2014) studies by replacing animals with alternative tools. *In vitro* tests are those that use cells in culture instead of complex organisms (Quinn, 2014) and *in silico* tests are performed by computers through modeling and programs, allowing to identify potential threats that a given chemical substance can cause from its molecular structure (Victal et al., 2014).

Therefore, knowing the diversity of existing tests, the objective of this study is to evaluate the literature regarding the use and importance of model and non-model organisms for ecotoxicological studies, within the context of alternative tools to the use of animals. Additionally, we evaluated the application of the 3Rs principles in ecotoxicological studies and identify the importance of these studies for environmental impact assessments.

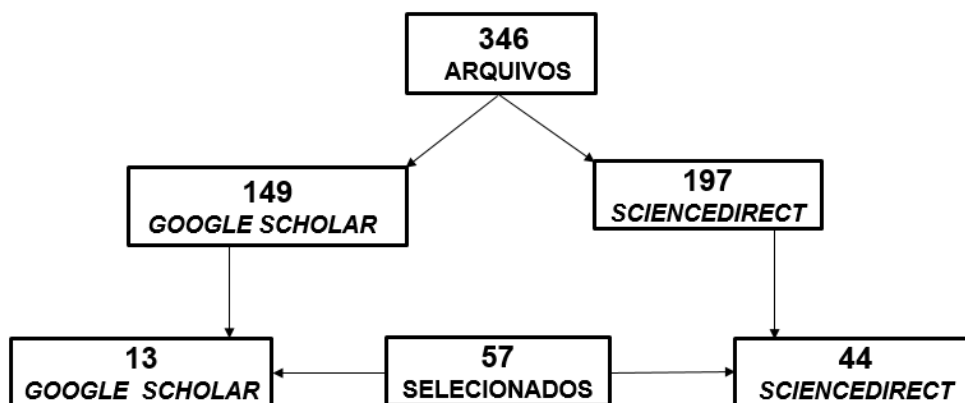
2 METHODOLOGY

The present study is a narrative literature review that seeks to answer the following question, "Among the organisms used in ecotoxicological research, which ones are being used the most?" The databases used were Google Scholar and ScienceDirect. The methodology used in the review is similar to that of Ferrari (2015). The searches were done without delimitation of a specific period and were conducted between July 2021 to February 2022. The descriptors were used in the English language: model organisms, non model organisms, *in vitro*, *in silico*, *in vivo* and ecotoxicological, employed together with the Boolean operator AND (model organisms AND non-model organisms AND *in vitro* AND *in silico* AND *in vivo* AND ecotoxicological).

After the search, the titles and abstracts of the publications were read, and the review articles, reports, news, case reports, results of dissertations or theses, books and abstracts published in congress annals were excluded. Only original research articles in English were included, with at least one *in vivo*, *in vitro* or *in silico* ecotoxicological test in the materials and methods. The included articles were reviewed in full. To increase the scope of the review articles, we also used articles found in the references of the

selected studies, which corroborate with the present study, but these were not included in the final number of selected articles, they were only used in the results and discussion topic. The dynamics of the selection process is described in Figure 1.

Figura 1. Flowchart of the selection of articles for the review.



Source: Authors (2022).

346 – archives
57 - selecteds

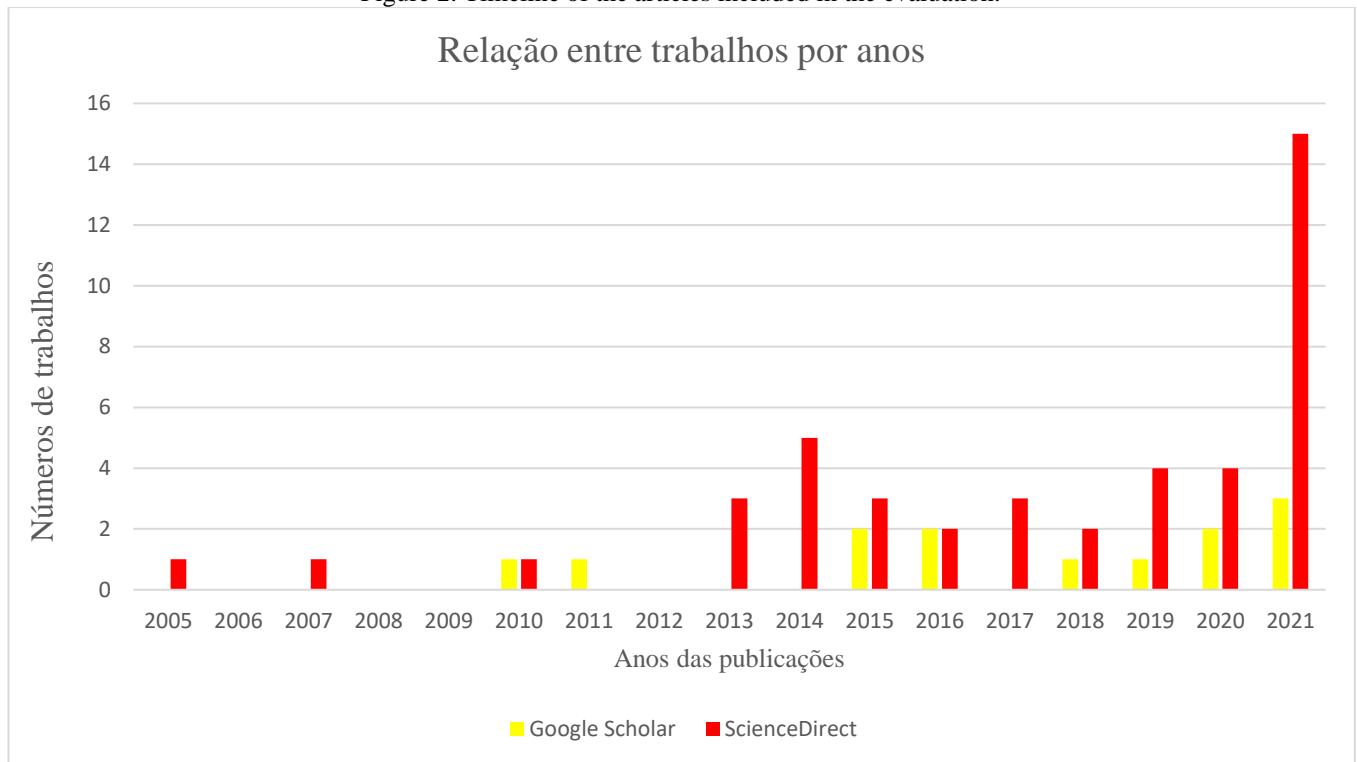
3 RESULTS AND DISCUSSION

3.1 GOOGLE SCHOLAR VS SCIENCEDIRECT

Through the initial searches to answer the question "Among the organisms used in ecotoxicological research, which are the most used?", using specific descriptors, 346 articles were found, 149 from Google Scholar and 197 from ScienceDirect. Among the 346 articles, after the inclusion process, 289 were excluded, leaving 57 articles, 13 from Google Scholar and 44 from ScienceDirect (Figure 1). The relatively low number of articles included from Google Scholar shows that although the database has a large number of files on the subject, many of them are review articles, books, dissertations, among others, which are listed within the exclusion factors of this evaluation. Moreover, it highlights the importance of searches in different platforms.

The ScienceDirect database showed a wider range of ecotoxicological articles according to the criteria used, and the 2 oldest articles (2005 and 2007) were found through this database. In Google Scholar the first selected articles were found from 2010 onwards (Figure 2). Both ScienceDirect and Google Scholar showed an increase in publications involving the evaluated theme and analysis criteria in recent years, highlighting the last three years, which corresponded to more than half (51%) of the selected articles and the year 2021, which presented 32% of the publications. This recent increase can be justified by the higher demand for industrial products (Miller et al., 2017) and applications of in silico studies (Rastogi et al., 2014; Gajewicz-Skretna et al., 2021a).

Figure 2. Timeline of the articles included in the evaluation.



Source: Authors (2022)

TRADUÇÃO:

Relação entre trabalhos por anos: relation among articles by years

Números de trabalhos: Number of articles

Anos das publicações: Years of Publication

3.2 FACTORS DRIVING TO THE EXPANSION OF ECOTOXICOLOGICAL STUDIES IN RECENT YEARS

The increase in ecotoxicological studies over the years is due to different factors, but we can highlight the inadequate disposal through agricultural and industrial activities in large cities, which threatens the environment (Seth et al., 2020). The products of this disposal, in contact with aquatic environments, can generate damage to the health of local biota and humans (Stinckens et al., 2016). Besides the aquatic environment, the terrestrial environment is also affected by the chemicals, as in the case of the antimicrobial Triclosan (TCS), 2-(2-4-dichlorophenoxy)-5-chlorophenol, which is widely used in the composition of personal care products (Zhu et al., 2018). Thus, ecotoxicological assessments are critical.

Studies have been conducted to evaluate the risk-benefit of industrial products (Jillella et al., 2021). According to REACH (Registration, Evaluation, Authorization and Restriction of Chemicals), the body responsible for the protection of the environment and human health in the European Union, industries are required to make available existing information regarding their chemicals and, in cases of products without sufficient information, provide new data (Gubbels-Van Hal et al., 2005).

The agricultural system also causes concern with respect to ecotoxicology. In an epigenetic study, it was found that exposure of oysters (*Crassostrea gigas*) to the herbicide diuron causes increased

methylation in the genetic material found in the digestive gland, which confirms the genotoxicity of this pesticide (Akcha, Barranger & Bachère, 2021). Furthermore, some pesticides have been reported to be toxic to birds (Zhang et al., 2015) and bees (Belsky et al., 2021). Certain pesticides are known to act as endocrine disruptors (EDs) (Legrand et al., 2016). EDs can cause problems during reproduction, growth, and development of organism exposed to them (Rodríguez et al., 2007).

As pharmaceutical products can cause great harm to the environment, there are several studies being conducted evaluating their ecotoxicity (Law et al., 2021; Minguez et al., 2014; Rastogi et al., 2014; Walker & Mceldowney, 2013). In aquatic ecosystems, these products promote various disturbances due to their chemical properties and because of transformation products (TPS) that are formed from biotic and abiotic actions (Rastogi et al., 2014). Due to the damage caused by TPSs, ecotoxicological studies have evaluated their potential harm (Law et al., 2021; Rastogi et al., 2014; Gutowski et al., 2015; Trawiński et al., 2021).

Currently, with the pandemic of COVID-19, some drugs have become eminent threats to the environment. Although the efficacy of azithromycin (AZT) and hydroxychloroquine (HCQ) are questioned (Jameleddine et al., 2020), both have become emerging drugs in terms of ecotoxicity due to their high use (Luz et al., 2021). This is due to the fact that the disposal of hospital waste is often not performed correctly, causing damage to the environment (Urban & Nakada, 2021). Another important factor is the incorrect disposal of pharmaceuticals into the sewage system (Minguez et al., 2014; Salgado et al 2021). As for AZT and HCQ, it has been reported that they can affect the aquatic environment, providing an increase in the energy expenditure of tadpoles (*Physalaemus cuvieri*), leading to adaptive physiological changes, which can cause problems in their reproduction and development in cases of prolonged exposures (Luz et al., 2021).

3.3 MODEL AND NON-MODEL ORGANISMS

Model organisms are characterized by their rapid life cycle (Legrand et al., 2016), well-characterized genetic material, and applicability of results that span other species, including humans (Howe et al., 2013; Martinez et al., 2018). In ecotoxicology, a well-known model organism is the zebra fish, *Danio rerio* (Prakash et al., 2021). This was evident during the present review, as it was the most commonly used organism in the experiments, along with the zooplankton species *Daphnia magna* (Table 1).

The zebra fish is the most commonly used vertebrate model organism in biomedical and ecotoxicological research (Prakash et al., 2021), and can be used from embryonic to adult stages (Stinckens et al., 2016). However, there is greater use of their embryonic stages, due to the fact that this stage of development represents a stage that is more sensitive to the damage caused by the toxicant (Strähle et al., 2012; Zhu et al., 2018; Prakash et al., 2021). It is worth pointing out that because the zebra fish is

widely studied, there is a lot of information about its physiology, which makes it a model not only for *in vivo* studies, but also for *in silico* assessments (Walker & Mceldowney, 2013).

The use of mammals in research is a complex issue due to current legislation and the high financial cost of these studies (Siméon et al., 2020). Even for this reason, as shown in Table 1, the studies used in this review that used mammals, were performed with the application of *in vitro* assay or *in silico* assay. Thus, the zebra fish emerges as an alternative organism to using mammals, from systemic analyses, because it has about 70% of similar genes and neurophysiological circuits similar to humans (Howe et al., 2013; Martinez et al., 2018). Their characteristics, such as the high number of eggs per spawning and the fact that they exhibit rapid development (Goldsmith & Jobin, 2012) make them excellent model organisms..

Table 1. Quantitative number of organisms used in the ecotoxicological studies found by this review.

Living organisms	Environment	Exposed substance	Number of studies found	References
Prokaryotes				
<i>Vibrio fischeri</i> (bacteria)	Aquatic	Organic UV filters; Diatrizoic acid; S-metolachlor.	4	(Law et al., 2021 ¹); (Rastogi et al., 2014 ²); (Singh & Gupta, 2014 ²); (Gutowski et al., 2015 ²)
<i>Escherichia coli</i> (bacteria)	Terrestrial	Diatrizoic acid	2	(Dom et al, 2010 ¹); (Rastogi et al., 2014 ²)
<i>Salmonella Typhimurium</i> (bacteria)	Terrestrial	Diatrizoic acid	1	(Rastogi et al., 2014 ²)
Eukaryotes				
<i>Danio rerio</i> (fish)	Aquatic	2-Mercaptobenzothiazole; Aniline; Triclosan; Valproic acid; 4- methylbenzylidene camphor; 3,4,3', 4'-tetrachloroazobenzene; Diclofenac; Ibuprofen; Levonorgestrel; Aldicarb Carbamate; Aldicarb Sulfoxide; Nano-Pd	10	(Wang et al., 2016 ¹² ; Anila et al., 2021 ¹ ; Küster & Altenburger, 2007 ¹³ ; Xiao et al., 2016 ¹ ; Prakash et al., 2021 ¹² ; Siméon et al., 2020 ¹² ; Zhu et al., 2018 ¹² ; Dom et al., 2010 ¹² ; Stinckens et al., 2016 ¹ ; Walker & Mceldowney, 2013 ²)

<i>Daphnia magna</i> (crustacean)	Aquatic	Aniline; Organic UV filters; Azole fungicides; Sertraline; Clomipramine; Amitriptyline; Fluoxetine; Paroxetine; Mianserin; Citalopram; Venlafaxine; Fentanyl; Amitriptyline; Trazodone; Venlafaxine; Sodium dichromate; Chrysoidin; Benzoa-pyrene	10	(David et al., 2011 ¹² ; Minguez et al., 2014 ¹ ; Gottardi & Cedergreen, 2019 ¹ ; Dom et al., 2010 ¹² ; Law et al., 2021 ² ; Gajewicz-Skretna et al., 2021b ² ; Trawiński et al., 2021 ² ; Osawa et al., 2019 ² ; Gajewicz-Skretna et al., 2021a ² ; Galimberti et al., 2020 ²)
<i>Pimephales promelas</i> (fish)	Aquatic	Fentanyl; Amitriptyline; Trazodone; Venlafaxine; Pesticides; Cyclonite; Diethylstilbestrol; Fenanthrene; Perfluorooctane sulfonic acid; Perfluorinated compounds; 17 α -ethinylestradiol	6	(Hala et al., 2015 ¹² ; Wang, et al., 2016 ¹² ; Trawiński et al., 2021 ² ; Osawa et al., 2019 ² ; Galimberti et al., 2020 ² ; Ewald et al., 2020 ²)
<i>Oncorhynchus mykiss</i> (fish)	Aquatic	3,4,3', 4'-tetrachloroazobenzene; propanil; 3,4-dichloroaniline; Propranolol; Metoprolol; Atenolol; Formoterol; Terbutaline; Ranitidine; Imipramine; Diclofenaco; Ibuprofen; Levonorgestrel; S-metholachloro; Pesticidas; 17 α -ethinylestradiol	6	(Alcaraz et al., 2021 ¹² ; Xiao et al., 2016 ³ ; Stott et al., 2015 ³ ; Walker & Mceldowney, 2013 ² ; Gutowski et al., 2015 ² ; Galimberti et al., 2020 ²)
<i>Homo sapiens</i> (human)	Terrestrial	Estrogen; Triphenyl phosphate	3	(Xiao et al., 2016 ²³ ; Chan et al., 2019 ³ ; Wang et al., 2020 ²³)
<i>Tetrahymena pyriformis</i> (protozoan)	Aquatic	Various chemicals; Fentanyl; Amitriptyline; Trazodone; Venlafaxine	3	(Singh & Gupta, 2014 ² ; Trawiński et al., 2021 ² ; Osawa et al., 2019 ²)
<i>Raphidocelis subcapitata</i>	Aquatic	Textile dyes; Pesticides; Polychlorinated biphenyls	3	(Jillella et al., 2021 ² ; Galimberti et al., 2020 ² ; Halm-Lemeille et al., 2014 ¹²)

(microalgae)				
<i>Oryzias latipestreinados</i> (fish)	Aquatic		2	(Gajewicz-Skretna et al., 2021b ² ; Gajewicz-Skretna et al., 2021a ²)
<i>Rattus norvegicus</i> (rat)	Terrestrial	3,4,3', 4'-tetrachloroazobenzene; propanil; 3,4 dichloroaniline; Sediment from Lake Sihwa - South Korea.	2	(Xiao et al., 2016 ³); (Cha et al., 2021 ³)
<i>Potamopyrgus antipodaru</i> (mollusk)	Aquatic	Tributyltin; Cadmium	1	(Ruppert et al., 2017 ¹)
<i>Tigriopus japonicus</i> (crustacean)	Aquatic	Cadmium; Copper; Zinc	1	(Jeong et al., 2014 ¹)
<i>Dunaliella tertiolecta</i> (seaweed)	Aquatic	Polycyclic aromatic hydrocarbons; styrene oligomers; alkylphenols	1	(An et al., 2021 ¹²)
<i>Isochrysis galbana</i> (seaweed)	Aquatic	Polycyclic aromatic hydrocarbons; styrene oligomers; alkylphenols	1	(An et al., 2021 ¹²)
<i>Phaeodactylum tricorutum</i> (seaweed)	Aquatic	Polycyclic aromatic hydrocarbons; styrene oligomers; alkylphenols	1	(An et al., 2021 ¹²)
<i>Piaractus mesopotamicus</i> (fish)	Aquatic	Nano-TiO ₂	1	(Clemente et al., 2013 ¹)
<i>Salmo trutta fario</i> (fish)	Aquatic	Holtemme River in situ study	1	(Schmitz et al., 2021 ¹)

<i>Physalaemus cuvieri</i> (frog)	Terrestrial	Azithromycin; Hydroxychloroquine	1	(Luz et al., 2021 ¹)
<i>Philodina acuticornis odiosa</i> (rotifer)	Aquatic	Hydrogen peroxide; Sodium azide	1	(Olah et al., 2017 ¹)
<i>Chironomus riparius</i> (fly)	Terrestrial	Azole Fungicides	1	(Gottardi & Cedergreen, 2019 ¹)
<i>Neomysis integer</i> (shrimp)	Aquatic	Tebufenozide	1	(Wilde et al., 2013 ¹²³)
<i>Melanogrammus aeglefinus</i> (fish)	Aquatic	Petroleum	1	(Sørhus et al., 2021 ¹)
<i>Micropterus salmoides</i> (fish)	Aquatic	Tretinoin; Quercetin; Cyclosporine; Valproic acid; Copper sulfate; Methyl Methanesulfonate; Cobalt chloride, Acetaminophen, Atrazine, Formaldehyde	1	(Basili et al., 2018 ¹²)
<i>Colinus virginianus</i> (bird)	Terrestrial	2,4-Dinitrotoluene	1	(Rawat et al., 2010 ¹²)
<i>Eurytemora affinis</i> (crustacean)	Aquatic	Pyriproxyfen; Chlordecone	1	(Legrand et al., 2016 ¹²)
<i>Eisenia fetida</i> (earthworm)	Terrestrial	AgNPs; Ag	1	(Novo et al., 2015 ¹²)
<i>Crassostrea gigas</i>	Aquatic	Diuron Herbicide	1	(Akcha et al., 2021 ¹³)

(mollusk)				
<i>Gobiocypris rarus</i> (fish)	Aquatic	Phenolic disinfection by-products. Aliphatic disinfection by-products	1	(Wang et al., 2021 ¹)
<i>Apis mellifera</i> (bee)	Terrestrial	Insecticide	1	(Belsky et al., 2021 ¹)
<i>Pseudokirchneriella subcapitata</i> (seaweed)	Aquatic	Aniline	1	(Dom et al., 2010 ¹²)
<i>Salmo salar</i> (fish)	Aquatic	Diclofenac; Ibuprofen; Levonorgestrel	1	(Walker & Mceldowney, 2013 ²)
<i>Haliotis tuberculata</i> (mollusk)	Aquatic	Biphenyl polychlorados; Sertraline; Clomipramine; Amitriptyline; Fluoxetine; Paroxetine; Mianserina; Citalopram; Venlafaxine	1	(Halm-Lemeille et al., 2014 ²³); (Minguez et al., 2014 ¹³)
<i>Gasterosteus aculeatus</i> (fish)	Aquatic	Ethinylestradiol; Trembolona	1	(Mintram et al., 2020 ²)
<i>Isochrysis galbana</i> (seaweed)	Aquatic	ZnO; Ag; CeO; CuO ENPs	1	(Miller et al., 2017 ²³)
<i>Aglais io</i> (insect)	Terrestrial	Cry insecticida	1	(Baudrot et al., 2021 ²)
<i>Crassius auratus</i> (fish)	Aquatic	Aldehydes; Phenols; Anilines; Alcohols	1	(Seth et al., 2020 ³)
<i>Poeciliopsis lucida</i> (fish).	Aquatic	2,3,7,8-Tetrachlorodibenzo-p-dioxin; Polycyclic aromatic hydrocarbons	1	(Seth et al., 2020 ³)

<i>Xenopus tropicalis</i> (frog)	Aquatic and terrestrial	Diclofenac; Ibuprofen; Levonorgestrel	1	(Walker & Mceldowney, 2013 ²)
<i>Daphnia pulex</i> (crustacean)	Aquatic	Diclofenac; Ibuprofen; Levonorgestrel	1	(Walker & Mceldowney, 2013 ²)
<i>Anas platyrhynchos</i> (bird)	Aquatic e terrestrial		1	(Zhang et al., 2015 ²)
<i>Nothura boraquira</i> (bird)	Terrestrial		1	(Zhang et al., 2015 ²)
<i>Coturnix japōnica</i> (bird)	Terrestrial		1	(Zhang et al., 2015 ²)
<i>Scenedesmus obliquue</i> (seaweed)	Aquatic		1	(Singh & Gupta, 2014 ²)
<i>Neocaridina davidi</i> (shrimp)	Aquatic	Diacylhydrazine	1	(Chan et al., 2019 ²³)
<i>Skeletonema costatum</i> (microalgae)	Aquatic	Pesticides	1	(Yang et al., 2021 ²)
<i>Cyprinus carpio</i> (fish)	Aquatic	S-metholachloro	1	(Gutowski et al., 2015 ²)
<i>Mus musculus</i> (mouse)	Terrestrial	Saxitoxins	1	(RAMOS et al., 2018 ³)
<i>Lemma gibba</i> (vegetable)	Aquatic	Pesticides	1	(Galimberti et al., 2020 ²)
<i>Chlorocebus sabaesus</i> (monkey)	Terrestrial	Polycyclic Aromatic Hydrocarbons	1	(Bak et al., 2019 ³)

Legend: Regarding the numbering of the references: ¹ refers to *in vivo* studies; ² are *in silico* studies; ³ are *in vitro* studies. Source: Authors (2022).

The other model organism widely used in ecotoxicological research is the zooplankton species *Daphnia magna* (Dom et al., 2010; Law et al., 2021; Gottardi & Cedergreen, 2019). This is an easy microcrustacean to maintain in laboratories because it is very small and has a short life cycle (Legrand et al., 2016). In addition, it presents high sensitivity to toxic products, which allows its use in ecotoxicological research (Gottardi & Cedergreen, 2019).

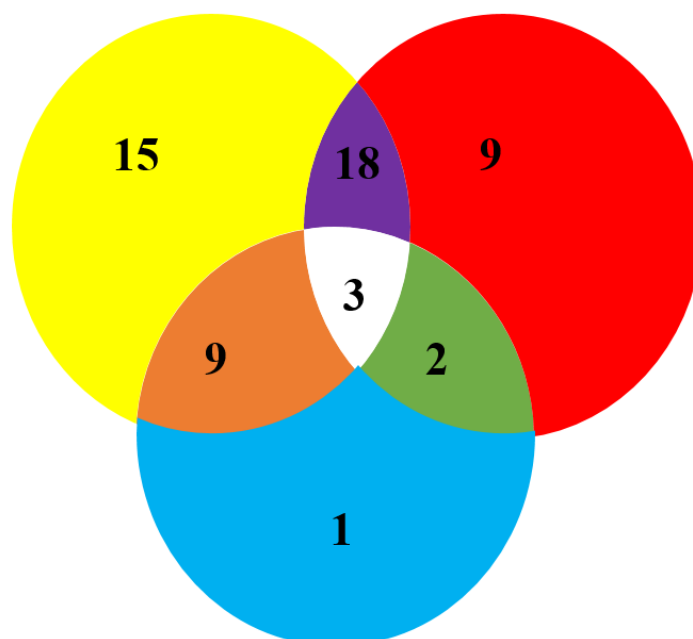
According to Table 1, *D. magna* is the most used invertebrate in ecotoxicological studies. In addition, this species is recommended as a model organism in genomic studies (Heckmann et al., 2008), and is considered a model organism in the evaluation of acute toxicity in aquatic environments (Cassotti et al., 2014). *Eisenia fetida* (earthworm), on the other hand, is classified as a model invertebrate in terrestrial environments, due to its importance in this ecosystem (Novo et al., 2015). However, its use appeared only once in Table 1, suggesting a greater focus on ecotoxicological research in aquatic environments and an apparent choice of non-model organisms in terrestrial environments.

Non-model organisms are those that do not match the characteristics of model organisms and are therefore used less in studies. However, the term does not mean that they are organisms that should not be used in research. One of the characteristics of non-model organisms is that they have their genetic material less understood compared to model organisms (Meyer et al., 2009; Rawat et al., 2010). However, advances in bioinformatics have been enabling a better understanding of the genetic material of these non-model organisms, which will enable a better use of them in studies (Vera et al., 2008; Rawat et al., 2010). One example is the case of the winter-rumped uru (*Colinus virginianus*), a non-model organism that had its material sequenced and exposed to 2,6-dinitrotoluene to perform an ecotoxicological evaluation. The result showed that the uru-do-norte has about 48% of similar genes to the model bird species (*Gallus gallus*), moreover, it showed some responses similar to those of the fatty fish on 2,6-dinitrotoluene exposure, which brings important systematic relationships of the uru-do-norte (Rawat et al., 2010). With this, the trend is that classic model organisms, such as *Daphnia magna* and *Danio rerio*, begin to share more space within ecotoxicological studies with other organisms with similar responses.

3.4 TYPES OF TESTING

There are different types of tests that can be conducted in toxicological research, highlighting *in vivo*, *in vitro* and *in silico* studies, which were quantified in the present review (Figure 3). The highest percentage of published papers involved *in silico* analyses, followed by *in vivo* analyses and lastly *in vitro* analyses. Of the 57 papers included in this review, only 1 (Stott et al., 2015) was entirely *in vitro*, suggesting the choice for integrated assessments (Gubbels-Van Hal et al., 2005).

Figure 3. Using the Ven Diagram to quantify the types of tests found from this review



Legend: Blue: *in vitro*; Red: *in vivo*; Yellow: *in silico*; Purple: *in silico* and *in vivo*; Green: *in vivo* and *in vitro*; Orange: *in silico* and *in vitro*; White: *in vitro*, *in silico* and *in vivo*

Source: Authors (2022)

3.4.1 *in vivo* assays

In vivo assays have the second largest number of studies (Figure 3). The *in vivo* assay has its use and application in many occasions in integrated analysis with *in silico* assay. The applications of *in vivo* tools in ecotoxicology seeks to analyze different "endpoints" from an established standard (Dom et al., 2010; Zhu et al., 2018; An et al., 2021), besides contributing to the expansion in the number of published works in this area. There are several organisms that can be used in these studies (Table 1), with the zebra fish being the most widely used. Through the zebra fish, one can assess, for example, mortality (Zhu et al., 2018), organ damage (Stinckens et al., 2016) and physiological processes (Xiao et al., 2016), as "endpoints" of the toxicological evaluation of substances.

The *in vivo* study is widely used in ecotoxicological research and is very important for conducting biomonitoring. With the current worrying scenario in aquatic ecosystems, the use of living organisms allows early identification of damage at the cellular level, from biomarkers, before it can become a major biological damage (Van der oos et al., 2003). One example is the use of micronucleus analysis in fish blood cells to assess the toxicity of a certain point in an aquatic environment (Schmitz et al., 2021).

The choice of living organisms in the experiment depends on the purpose of the study. In situations where it is desired to identify the damage caused by chronic exposure to local biota, organisms native to that region are used (Schmitz et al., 2021), but when the study aims to analyze the toxicity of a given substance, well-characterized model organisms are used, as in the case of *Daphnia magna* (Minguez et al., 2014) and *Danio rerio* (Prakash et al., 2021). Furthermore, one of the advantages of the *in vivo* method is the possibility of in situ study, which allows the use of organisms that are being directly exposed to the environment that is intended to be evaluated (Schmitz et al., 2021)

3.4.2 *in vitro* assays

Of the 57 articles included in this review, only 1 (Stott et al., 2015) was entirely *in vitro*. *In vitro* models are characterized by the possibility of evaluating cells from a controlled environment and isolated from the living organism (Halm-Lemeille et al., 2014), providing information at cellular and molecular levels (Binelli et al., 2009). Thus, *in vitro* studies enable the reduction of the number of animals that need to be killed in *in vivo* assays, constituting a relevant alternative for research.

Besides reducing the use of live organisms in research, *in vitro* studies contribute to the demands of ecotoxicological studies (Gubbels-Van Hal et al., 2005). Thus, *in vitro* assays play an important role not only ethically, but also as a way to promote chemical assessments. These assays are widely used in genotoxicity assessments (Binelli et al., 2009; Wang et al., 2020), such as in identifying methylations in DNA (Akcha et al., 2021) and in introducing reporter gene to evaluate harmful substances in monkey (*Chlorocebus aethiops*) cells and in humans. (Bak et al., 2019; Chan et al., 2019). In addition, they are fundamental in cytotoxicological studies, where through tools, such as the MTT ([3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide] cell viability test) evaluate enzyme activities (Minguez et al., 2014; Halm-Lemeille et al., 2014).

3.4.3 *in silico* assays

Within ecotoxicology, *in silico* assays help in the identification of predictive responses, through computational and mathematical models (Dom et al., 2010). Due to obtaining results faster and at a lower cost compared to *in vivo* and *in vitro* assays, *in silico* assays have become the most widely used in ecotoxicological research, according to results obtained in the present review (Figure 3).

Applications of computational and mathematical tools allow simulation of chemical exposure to organisms (Baudrot et al., 2021). For example, PBPK (physiologically based pharmacokinetic models) mathematical modeling studies are able to simulate chemical exposure in zebra fish, which is a model organism often used in *in vivo* studies (Siméon et al., 2020). Thus, *in silico* studies allow the number of animals in research to be reduced, which also explains the increased use of this assay in ecotoxicological assessments (Figure 3).

One of the most widely used methodologies to predict toxicities of substances is Quantitative Structure-Activity Relationship (QSAR) (Zhu et al., 2018; Jillella et al., 2021; Law et al., 2021). Studies using QSAR primarily seek to develop and validate models for evaluating toxic products from the analysis of biological activity using mathematical forms (Singh & Gupta, 2014; Yang et al., 2021). One of the advantages of this method is that there are free QSAR software, such as ECOSAR, which makes this approach more accessible (DOM et al., 2010).

Genetics plays an important role in *in silico* studies, because with the advancement of bioinformatics, it has enabled a greater applicability of omics: genomics (Rawat et al., 2010) transcriptomics, proteomics and metabolomics (Wang et al., 2020). Often, omics studies integrate the use

of *in silico* testing with *in vitro* (Wang et al., 2020) or *in vivo* (Alcaraz et al., 2021) testing, as their analyses are made from biomolecules and computational data (Schmitz et al., 2021). The application of omics science is only possible due to the availability of databases, such as GenBank (Novo et al., 2015) and National Center for Biotechnology Information Gene Expression Omnibus (NCBI) (Wang et al., 2016).

Omics analysis has enabled good ecotoxicological assessment (Schmitz et al., 2021). For example, joint analysis using transcripts, proteins, and metabolites has been shown to be effective in evaluating the pollutant triphenyl phosphate (TPP) in human cells (Wang et al., 2020). These assessments can be done separately as well, for example, several studies have been using only transcriptomic analysis in ecotoxicological assessments, such as in identifying genes responsible for the immune response of organisms exposed to heavy metals (Jeong et al., 2014) and in assessing genotoxicity in *Daphnia magna* (David et al., 2011).

3.5 3rs Principles

The 3Rs principles (reduction, replacement, and refinement) in the scientific environment emerged in 1959 with the publication of the book "The principles of humane experimental technique", with the purpose of reducing the number of animals and their discomfort in research (Russell & Burch, 1959). From then on, the 3Rs started to become present in research around the world, including being part of laws related to the use of animals in research (Astrogildo et al., 2018). For this reason, there is a need for and consequently, increased occurrence of alternative studies to *in vivo* ones, such as *in silico* and *in vitro* assays (Stinckens et al., 2016). In ecotoxicological studies, as shown in (Figure 3), the search for the alternative tests exceeded the number of *in vivo* studies. This shows that research does not always rely on studies with living organisms and that *in vitro* and *in silico* studies have been proving effective in ecotoxicological assessments.

In addition, the *in vivo* studies themselves are changing their methodologies, as in the case of studies with zebra fish, where most studies are being conducted in the embryonic stage (Küster & Altenburger, 2007; Zhu et al., 2018; Prakash et al., 2021;). Unlike the adult stage, the embryonic stage of these fish has no legislation preventing their use in studies conducted in Europe, so they are even used to replace animals in research (Strähle et al., 2012; Zhu et al., 2018; Prakash et al., 2021).

Regulatory agencies and research organizations seek the implementation of alternative tests not only for ethical reasons, but for technical reasons as well, since *in silico* testing, for example, presents as a faster and cheaper alternative (Gubbels-Van Hal et al., 2005). Furthermore, due to the increase in chemicals, there is a need to speed up their evaluation in the environment through vertebrate, invertebrate, *in vitro* or *in silico* experimental models. In this way computer-based approaches tend to increase further, as they are faster than those done on animals (Gajewicz-Skretna et al., 2021b).

4 CONCLUSION

The present review indicates that the invertebrate *Daphnia magna* and the vertebrate *Danio rerio* were the most commonly used organisms and thus a great importance in ecotoxicological assessments. In addition, model organisms collaborate to the creation of alternative methods, as in the case of *in silico* studies, which proved to have the highest rate of applications in ecotoxicological assessments. The results show that there is a concern for the application of the 3Rs principles in ecotoxicological studies. This can be seen from the analysis of the amount of each model applied, where there was a large amount of applications of *in vitro* and *in silico* studies.

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CHAPTER 19

Changes in the stomatognathic system in face of COVID-19 - an integrative review

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ABSTRACT

The oral cavity is closely related to SARS-CoV-2 due to the high concentration of angiotensin-converting enzyme 2 receptors. In addition, the infection and its associated therapies contribute to the manifestation of oral changes in different cases.

The purpose of this research was to conduct a review regarding the possible changes that SARS-CoV-2 causes in the stomatognathic system. The methodology used was an integrative literature review, guided by the research question developed by the PICO strategy.

The results showed that the main oral changes associated with COVID-19 are disorders of taste and smell, followed by dry mouth or hyposalivation and ulcerations. Several oral manifestations have been observed, however, there is not enough evidence to determine a causal relationship with infection or SARS-CoV-2. It is important that health professionals are aware of dysgeusia and hyposmia as the first sign of COVID-19.

Keywords: Coronavirus infections, Mouth, Dentistry, Public health

1 INTRODUCTION

A new coronavirus was first detected in late 2019 and quickly became a global outbreak, being named SARS-CoV-2 (LIU; KUO; SHIH, 2020). Declared a pandemic by the World Health Organization (WHO) in March 2020, the infection has had 51,848,261 confirmed cases and 1,280,868 deaths, and is present in 220 countries/territories (WHO, 2020). Patients present with a wide range of symptoms: fever, cough, shortness of breath, sore throat, nasal congestion, myalgia, headache, abdominal pain, diarrhea, and others (HUANG, et al. 2020), and as research regarding COVID-19 has advanced, gustatory and olfactory disturbances have been found to be common (PASSARELLI, et al. 2020).

The routes of transmission of SARS-CoV-2 involve direct transmission - coughing, sneezing and partridges - or contact with oral, nasal and ocular mucosa (MOURA; MOURA; PEREIRA; MARINHO, 2020) and it has also been found that the viruses can be transmitted in an interpersonal manner through contact, direct or indirect, with fluids such as saliva (DE CAMPOS TUNÃS et al., 2020).

The oral cavity has an intimate relationship with SARS-CoV-2 due to the high concentration of angiotensin-converting enzyme (ACE2) receptors in its organs and tissues. The virus expresses proteins on its outer surface that facilitate its binding to host cells via ECA2 (DIAS, et al., 2020) and therefore organs

and tissues that express high amounts of ECA2 can be targeted by SARS-CoV-2 and develop an inflammatory response associated with the viral presence (XU, et al., 2020). The ACE2 receptor can be found in other organs such as small intestine, testicles, adipose tissue, in the thyroid, kidneys, myocardium, among several others; it can also be seen in the salivary glands, having an average expression level of 1.8 pTPM (protein-coding transcripts per million) - it is the tenth organ with the highest concentration of ACE2, with a higher expression level, even, than the lung (WANG, et al, 2020). Research on receptors in the oral cavity has shown that there is expression of ACE2 in the oral mucosa and that there is a higher concentration in epithelial cells of the tongue (XU, et al, 2020).

There is still no drug therapy considered, by scientific evidence, effective against COVID-19 and, those with potential have been associated with several side effects (NCBI, 2020). Thus, SARS-CoV-2 infection and its associated therapies may contribute to different outcomes related to the oral cavity (AMORIM, et al, 2020) and the stomatognathic system.

The objective of this study is to perform an integrative review regarding the possible changes that SARS-CoV-2 causes in the stomatognathic system, answering the following research question: "What are the main changes that SARS-CoV-2 causes in the oral cavity?"

2 MATERIALS AND METHODS

This study is characterized as an integrative literature review, which, according to Stetler (1998), is a systematic analysis aimed at synthesizing the research on a certain topic and is an important method when there is the need to solve a clinical problem or assess the use of concepts in the scientific context. It was developed based on the phases proposed by Botelho, Cunha and Macedo (2011), namely: 1. identify the theme and research question; 2. establish inclusion and exclusion criteria; 3. identify selected studies; 4. categorize selected studies; 5. perform the analysis and interpretation of results and, 6. present the review and synthesis of knowledge.

The question that guided this research was developed using the "PICO" strategy (STONE, 2002), where P (population) - patients confirmed with COVID-19; I (independent variable) - with oral changes; C (comparison) - without oral changes; and O (outcomes) - presence and type of changes. This applied strategy resulted in the following research question: "What are the main changes that SARS-CoV-2 causes in the oral cavity?"

The literature search was done in three databases: Scielo, Scopus and LiLacs and the definition of the descriptors was done by consulting the DeCS (descriptors in health sciences) platform. The terms used were "Coronavirus Infections", "COVID-19", and "mouth", with the aid of the Boolean operators "AND" and "OR". The inclusion criteria were broad due to the nature of the search, admitting publications from 2020 classified as original articles, review articles, clinical cases, and also short communications and letters to the editor. These broad inclusion criteria were thought to be due to SARS-CoV-2 being a new pathogen,

so an attempt was made to include as much pertinent information as possible. The inclusion criteria involved: articles that did not have as their scope oral changes related to COVID-19 or in vitro research.

Data were extracted using the instrument recommended by Pompeo (2007) and adapted by the authors to answer the research question. The level of evidence was based on Melnyk and Fineout-overholt's (2011) classification as follows: Level I - Evidence from a systematic review or meta-analysis of all relevant randomized clinical trials; Level II - Evidence obtained from well-planned randomized clinical trials; Level III - Evidence obtained from well-designed controlled trials without randomization; Level IV - Evidence from well-planned case and cohort studies; Level V - Evidence from systematic reviews of descriptive and qualitative studies; Level VI - Evidence from single descriptive or qualitative studies; Level VII - Evidence from authority opinion and/or expert committee reports.

Results are presented based on categorization of information according to convergent themes.

3 RESULTS AND DISCUSSION

An initial search identified 316 papers using the defined search criteria: 176 in Scielo, 107 in Scopus, and 33 in LILACS. This was followed by a pre-selection based on the established inclusion criteria, resulting in a total of 116 papers, 42 in Scielo, 65 in Scopus, and 9 in LILACS. After checking for duplicate publications, the number of studies to be read in full was 53. After applying the last filter and reading the full texts, 21 studies were left that met the inclusion criteria and, to a greater or lesser extent, answered the research question about the oral changes observed in patients confirmed with COVID-19.

Thus, 21 (100%) publications were included in this integrative review. They were organized according to the information pertinent to the research and methodological design and are presented in chart 1.

IDENTIFICATION	OBJECTIVE	METHODOLOGY	RESULTS AND CONCLUSIONS regarding the research question
Gómez, J. L. M. <u>Odontol. sanmarquina (Impr.)</u> ;23(3), 2020-08-04	To present important aspects of COVID-19 and its relation to dental practice, with emphasis on preventive measures in order to avoid cross-infection.	Literature review	The virus genome was detected in saliva indicating possible infection of the salivary glands. Anosmia and agorusia was reported as a symptom of COVID-19, and in most patients (91%) these symptoms appeared before the respiratory ones. Descaling gingivitis, ulcers and vesicles compatible with recurrent herpetic stomatitis have been reported on the mucosa of the palate, as well as burning sensation and pain in the oropharynx. Untreated moderate to severe periodontitis may worsen in severe cases of COVID-19

			(inflammatory state seems to act as a trigger of the coagulation cascade and is associated with higher levels of fibrinogen degradation products). Acute necrotizing periodontitis also had its occurrence rate increased in this period of increased cases of COVID-19,
Fantozzi, P. J. et al. Xerostomia, gustatory and olfactory dysfunctions in patients with COVID19	To assess the prevalence and characterize xerostomia and taste and olfactory dysfunctions in patients with COVID-19.	Retrospective cohort, where SARS-CoV-2 positive adults completed questionnaires regarding the symptoms dysgeusia, hyposmia/anosmia and xerostomia.	Xerostomia and gustatory and olfactory dysfunctions are common in patients with COVID-19, concomitant and in some cases the only manifestations of the disease. such symptoms should be considered in screening in order to identify patients with early-stage SARS-CoV-2.
Corchuelo, J.; Ulloa, F. C. Oral manifestations in a patient with a history of asymptomatic COVID-19: Case report	To report a case of oral manifestations in an asymptomatic patient with COVID-19.	Case report.	Reddish plaques on the lower lip, dark brown pigmentation on the inserted gingiva and petechiae on the palate.
Biadsee, A. et al. Olfactory and Oral Manifestations of COVID-19: Sex-Related Symptoms A Potential Pathway to Early Diagnosis	To evaluate the early manifestations of COVID-19, with emphasis on olfactory and oral disturbances.	A prospective cohort, where adults with COVID-19 completed a six-section questionnaire regarding symptoms related to oral cavity, taste and smell.	The patients perceived olfactory and gustatory dysfunctions, xerostomia, frontal headache, pain in masticatory muscles. In addition, to a lesser extent, changes in tongue sensitivity, plaque-like lesions on the tongue, edema on the palate, tongue and gums, and bleeding in the oral cavity were also observed.
Cant, A.; Bhujel, N.; Harrison, M. Oral ulceration as presenting feature of paediatric inflammatory multisystem syndrome associated with COVID-19	Share the insight from the Department of Pediatric Dentistry at Saint Thomas Hospital, London regarding lip edema and ulcerations as an early symptom of developing pediatric multisystemic inflammatory syndrome associated with COVID-19.	Letter to the Editor	Lip edema and ulceration with subsequent development of pediatric multisystemic inflammatory syndrome associated with COVID-19.
Abalo-Lojo, J. M.; Pouso-Diz, J. M.; Gonzalez, F. Taste and Smell Dysfunction in COVID-19 Patients	To analyze the extent to which taste dysfunctions and anosmia were present in patients with COVID-19.	Letter to the editor, research methodology not described.	Taste dysfunction and anosmia are prominent symptoms in COVID-19 patients and, together with cough and asthenia, are the most frequently reported. In

			addition, they tend to appear in the first days of the disease and, therefore, can be valuable for early diagnosis.
dos Santos, J. A. et al. Oral mucosal lesions in a COVID-19 patient: new signs or secondary manifestations?	To report a relevant case of oral manifestations in a patient with COVID-19.	Case Report	Persistent white plaque on the dorsum of the tongue, as well as yellowish punctate ulcers - similar to a late stage of herpetic ulceration.
Lai, C.; Ko, W.; Lee, P.; Jean, S.; Hsueh, P. Extra-respiratory manifestations of COVID-19	To provide a review of the extra-respiratory manifestations of COVID-19 to aid in understanding the clinical presentations of the disease.	Review	Ageusia and dysgeusia, anosmia and hyposmia.
Ren, Y. F.; Rasubala, L.; Malmstrom, H.; Eliav, E. Dental Care and Oral Health under the Clouds of COVID-19	Review current evidence related to the impact of SARSCoV-2 / COVID-19 on dental care and oral health.	Review	Clinical, empirical, and biological evidence suggests that oral mucosa is a SARS-CoV-2 entry site and that oral symptoms, including dysgeusia or ageusia, xerostomia, hyposmia, or anosmia, may be the first symptoms of COVID-19 before fever, dry cough, fatigue or shortness.
Odeh, N. D. et al. COVID-19: Present and Future Challenges for Dental Practice	Address the medical and dental aspects of COVID-19 infection.	Review	Virus genome was found in most salivary glands of patients with COVID-19, suggesting infection of the salivary glands; another change cited in the review is the presence of gustatory changes.
Maciel, p. P. et al. COVID-19 Pandemic: Oral Repercussions and its Possible Impact on Oral Health	Discuss the likely dental and oral consequences of COVID-19	Review	Studies have been published on the vertical transmission of SARS-CoV-2 and the risk to the overall health of newborns, but few data are available on the effect of SARS-CoV-2 in pregnancy. Concomitant gustatory and olfactory dysfunction have been reported, as well as xerostomia; it is suggested that these changes may be related to ACE2 receptor expression in oral tissues. Ulcerations, petechiae, reddish macules, desquamative gingivitis, and blisters have been reported.

Passarelli, P. C. et al. Taste and smell as chemosensory dysfunctions in COVID-19 infection	To review the literature regarding two clinical manifestations in patients with SARS-CoV-2: anosmia and ageusia.	Systematic Review	It demonstrated the presence of ageusia and anosmia in multiple cases of SARS-CoV-2, making the occurrence of these symptoms an important suspect for COVID-19.
Pedrosa. M. S.; Sipert, C. R.; Nogueira, F. N. Salivary Glands, Saliva and Oral Findings in COVID-19 Infection	Provide an overview of the salivary glands and saliva in the context of SARS-CoV-2 infection discuss oral disorders in patients with COVID-19.	Review	Hyposalivation was observed, but may be associated with stress or medications. Taste and smell dysfunctions also appeared. Regarding oral changes, the diagnosis can be confusing because of the clinical features that run the course of viral infections, but in general they appear as ulcers or blisters.
Samaranayake, L. P.; Fakhruddin., K. S.; Panduwawala, C. início súbito, perda aguda do paladar e do olfato na doença coronavírus 2019 (COVID-19): uma revisão sistemática	To systematically review the contemporary evidence regarding dysgeusia and anosmia as a trigger for prodromal symptoms in patients with COVID-19.	Systematic review	The review indicates a reasonable prevalence of acute onset olfactory and taste symptoms in patients with COVID-19.
Kahraman, F. C.; Çaskurlu, H. Mucosal involvement in a COVID-19-positive patient: a case report	To present the case of a patient with SARS-CoV-2 infection who had oropharyngeal lesions.	Letter to the Editor	Ageusia and anosmia, sore throat due to erythematous lesion on oropharynx and hard palate, with pustular enanthem on soft palate.
Soares, et al. Oral lesions in a patient with Covid-19	To report the clinical and microscopic features of the oral lesions of a SARS-Cov-2 positive patient.	Letter to the Editor	Painful ulceration on buccal mucosa, reddish macules on hard palate, tongue and lips. The authors suggest that SARS-CoV-2 causes oral changes.
Lechien, J. R. et al. Gustatory dysfunctions in COVID-19	Highlight the importance of considering taste impairment in patients with COVID-19.	Letter to the Editor	Patients report hyposmia and dysgeusia, which compromises their quality of life. In the case of COVID-19, ECA2 receptors were identified in the oral cavity, having high expression in tongue, which would explain the hypothesis that infection and inflammatory response could lead to alterations in saliva production, normal flavor translation, and continuous renewal of taste buds.
Melley, L. E.; Bress, E.; Polan, E. Hypogeusia as	Review the clinical course of SARS-CoV-2 in relation to	Case Report	The patient presented with the initial symptom of altered taste and smell perception

the initial presenting symptom of COVID-19	the reported symptom of hyposmia and hypogeusia.		prior to respiratory involvement. After a period of hospitalization, the patient recovered most of her sense of smell and was discharged with only persistent dysgeusia
Kitakawa, D. et al. Short report Herpes simplex lesion in the lip semimucosa in a COVID-19 patient	Discuss the oral manifestations in a patient with a confirmed diagnosis of COVID-19.	Case Report	Vesiculo-bullous lesions on lip, with onset and resolution within 14 days.
Chen, L. et al. Detection of 2019-nCoV in Saliva and Characterization of Oral Symptoms in COVID-19 Patients	Provide an understanding regarding the detection of SARS-CoV-2 in saliva and the initial oral symptoms in oral tissue infection.	Observational - saliva was collected to analyze the presence of nucleic acids from SARS coronavirus 2 and a questionnaire was applied about 14 oral symptoms.	Saliva can be a means of detection of SARS-CoV-2. According to the analysis of the questionnaires, the main oral symptoms were xerostomia and dysgeusia.
Katz, J. Running Head: aphthous stomatitis and Covid 19	To provide and cross-reference information regarding the prevalence of recurrent aphthous stomatitis and COVID-19 and its strength of association.	Observational - compared prevalence rates of RAS of patients with and without COVID-19.	The prevalence of RAS was higher in patients infected with COVID-19.

Brazil was the country that presented the most papers included in this review - five (24%), followed by Italy and the United States, with two papers (9%) each. The other studies were published by researchers from Taiwan, Peru, Saudi Arabia, United Arab Emirates, Colombia, Istanbul, Israel, China, and European countries - Spain, United Kingdom, France -, individually or in groups. The publications included literature reviews (6, representing 29% of the papers), two systematic reviews (9%), four case reports (19%), letters to the editor (five, representing 24%), and four observational studies (19%).

Regarding the level of evidence, the one found for the studies included in this review was good, taking into account that this is a new disease and that there is still little time to have more robust evidence. Of the 21 articles included, two have level I evidence, four have level IV, six have level V, four level VI, and five level VII. Thus, although there is scientific evidence that proves some relationship between COVID-19 and oral alterations, there is still the need to develop controlled and randomized studies in order to build bases to guide clinical practice.

Regarding the oral changes found in the published papers on the subject, sixteen (76%) of them cite taste dysfunctions - ageusia, hypogeusia, dysgeusia - as a symptom of SARS-CoV-2 infection (GÓMEZ, 2020; FANTOZZI, et al, 2020; BIADSEE, et al, 2020; SAMARANAYAKE, FAKHRUDDIN, PANDUWAWALA, 2020; KAHRAMAN, ÇASKURLU, 2020; LECHIEN, et al, 2020; MELLEY, BRESS, POLAN, 2020; CHEN, et al, 2020; ABALO-LOJO, POUISO-DÍAZ, GONZALEZ, 2020; LAI,

WNAG, HSUEH, 2020; REN, RASUBALA, MALMSTROM, ELIAV, 2020; ODEH, et al, 2020; MACIEL, et al, 2020; PASSARELLI, et al, 2020; PEDROSA, SIPERT, NOGUEIRA, 2020). The mucosa of the mouth has been considered as a potential route of entry for SARS-CoV-2 into the body (PENG et al, 2020), due to the high expression of the ECA2 receptor, which is responsible for facilitating the entry of the virus into cells (DIAS et al, 2020) and a survey done to assess the presence of these receptors in the oral cavity showed that there is expression of ECA2 in the mucosa of the mouth and that there is a higher concentration in epithelial cells of the tongue (XU, et al, 2020).

Olfactory changes were also widely reported, appearing in 13 of 21 papers (62%) (GÓMEZ, 2020; FANTOZZZI, et al, 2020; BIADSEE, et al, 2020; SAMARANAYAKE, FAKHRUDDIN, PANDUWAWALA, 2020; KAHRAMAN, ÇASKURLU, 2020; LECHIEN, et al, 2020; MELLEY, BRESS, POLAN, 2020; ABALO-LOJO, POUISO-DÍAZ, GONZALEZ, 2020; LAI, WNAG, HSUEH, 2020; REN, RASUBALA, MALMSTROM, ELIAV, 2020; MACIEL, et al, 2020; PASSARELLI, et al, 2020). Lechien and colleagues (2020) showed that women are proportionally more affected by hyposmia or anosmia when compared to men ($p < 0.001$). According to Petrescu et al (2020), dysfunctions such as anosmia and ageusia were observed as symptoms induced by the inflammation caused by COVID-19.

Xerostomia and hyposalivation were symptoms that appeared in six studies (29%) (REN et al, 2020; MACIEL, et al, 2020; FANTOZZZI, et al, 2020; BIADSEE, et al, 2020; PEDROSA, SIPERT, NOGUEIRA, 2020; CHEN, et al, 2020), while ulcerations - in different locations of the oral cavity - were cited in five (24%) (dos SANTOS, et al, 2020; MACIEL, et al, 2020; PEDROSA, SIPERT, NOGUEIRA, 2020; CANT, BHUJEL, HARRISON, 2020; SOARES, et al, 2020). Taste is the main stimulant for the formation of saliva, and this may be an explanation for the occurrence of hyposalivation and xerostomia; a study has already shown xerostomia occurring secondary to nasal congestion and rhinorrhea, due to mouth breathing (KNIGHT, 1995); Biadsee and team (2020) found 50% of their sample positive for COVID-19 presenting dysgeusia and xerostomia associated, corroborating this hypothesis. Another possibility for the decreased salivary flow is due to the installed infectious and inflammatory process, which is known to lead to hyposalivation (MORTAZAVI et al, 2014); Thus, the possibility of an infection of the salivary glands by SARS-CoV-2 inducing an inflammatory state and consequent decreased function should not be ruled out (PEDROSA, SIPERT, NOGUEIRA, 2020).

Different viral diseases can cause problems to the stomatognathic system, directly or in a secondary manner; the manifestations may vary but, in general, they appear as ulcerations or blisters in the oral tissues (SANTOS, MUDDANA, 2020). Corroborating this information, vesiculo-bullous lesions were cited by Katz (2020), Kitakawa et al (2020) and Maciel et al (2020).

Maciel et al also cited reddish patches in the oral cavity, as did Corchuello and Ulloa (2020) and Soares et al (2020). Table 2 summarizes the main changes raised in the literature review of the included studies.

tt	REPORTS
Ageusia/ disgeusia	16/21 (76%)
Hyposmia/ anosmia	13/21 (62%)
Xerostomia/ hyposalivation	6/21 (29%)
Ulcerations	5/21 (24%)
Vesiculobullous lesions	3/21 (14%)
Desquamative gingivitis	2/21 (9%)
Reddened lesions (palate, tongue, oropharynx, lips)	3/21 (14%)
Petechiae	2/21 (9%)
Plaque-like lesions on tongue	2/21 (9%)
Table 2. Main oral changes observed in patients with COVID-19.	

In addition to the changes mentioned in table 2, recurrent herpetic stomatitis, pain and burning in the oropharynx (GÓMEZ, 2020), dark brown pigmentation in the inserted gingiva (CORCHUELLO, ULLOA, 2020), changes in tongue sensitivity and bleeding in oral cavity, frontal headache and pain in masticatory muscles (BIADSEE, et al, 2020) have been described. Brown pigmentation in the gums can be explained by the relationship that different factors produced during the inflammatory state - prostaglandins, leukotrienes, cytokines, and inflammatory mediators - may play a role in increasing melatogenesis (LAMBERT, et al, 2019).

A higher prevalence of recurrent aphthous stomatitis has also been cited in patients confirmed with COVID-19 than in those healthy (KATZ, 2020). Xu et al (2020) point to the oral cavity as a target for SARS-CoV-2, explained by the wide distribution of ECA2 receptors in oral tissues and the spectrum of changes published in the literature associated with COVID-19 includes aphthous and vesicular ulcerations (MARTÍN CARRERAS-PRESAS et al, 2020).

Gómez (2020) cites Vieira (2020) who hypothesizes that periodontitis in the moderate to severe stages may lead to a worsening in COVID-19 cases, mediated by the persistent inflammatory state (seen in periodontal disease) that triggers the coagulation cascade and is related to higher levels of fibrinogen degradation products, such as D-dimer. Gómez (2020) also cites, based on Patel and Woolley (2020), the increased occurrence of acute necrotizing periodontitis in the period of the new coronavirus pandemic - the etiology of which may be related to bacterial co-infections occurring in the intraoral environment of patients with COVID-19.

The publication of material that speaks to the occurrence of oral changes from COVID-19 is still very recent in the literature and thus may vary significantly; moreover, underlying diseases, both systemic and local, may be a contributing factor to oral cavity lesions. Thus, it is not yet possible to state that the

oral findings in patients infected with SARS-CoV-2 reported in the literature are direct manifestations of COVID-19 (PEDROSA, SIPERT, NOGUEIRA, 2020).

FINAL CONSIDERATIONS

This integrative literature review pointed out the presence of taste and smell disorders in patients infected with SARS-CoV-2, making such symptoms to be considered an important suspicion of the patient's infection, as other studies have already indicated. Furthermore, it has pointed to the occurrence of xerostomia or hyposalivation associated with COVID-19. Other oral changes observed in some papers were ulcerations, which are also a very common manifestation of viral infections in the mouth. Studies are needed to understand the real role of the virus in the occurrence of the symptoms that were raised.

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CHAPTER 20

Law and art: importance, relevance and challenges

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ABSTRACT

Law and Art. can be connected in many different ways: as a constitutional right, as intellectual property

rights, as well as reflected in other legal branches. This paper aims to analyze how these two subjects can be used in an interdisciplinary way, whether as methodological proposal in legal education, or as a tool to approximate this content to the population as a whole. Considering this is exploratory research, the main objectives are to contribute to Law and Art epistemological branch, as well as provide the initial contact with readers that might be interested by this interdisciplinarity. It is chosen as methodological instrument deductive reasoning in order to perform comprehensive-juridical research. The materials used are bibliographic and qualitative. Among the results, it can be noticed the relevance in this intersectional field, while also comprehending its origins, its relevancy and the main challenge it faces.

Keywords: Law, Art, interdisciplinarity

1 INTRODUCTION

The right to art refers to a right foreseen in the Federal Constitution, whether through freedom of artistic expression (art. 5, IX), through study (art. 210, caput) and the guarantee of access to it (art. 208, V), or through the protection of goods with artistic values (art. 23, III and IV, art. 24, VII and VIII). Thus, art is part of the patrimony of Brazilian culture (art. 216, caput, III, IV and V).

On the other hand, art law refers mainly to Civil Law in the branch intended for the protection of intellectual property. Specifically, in the scope of copyright law and its legal reflexes, such as the possibility of registration, the mode of legal protection and the consequences in case of non-compliance with these rights.

However, the art law also has reflexes in other areas besides civil, such as Administrative, Tax and International Law (MAMEDE; FRANCA FILHO; RODRIGUES JUNIOR, 2015). Another caveat that should be made is that

although 'art' lato sensu includes 'the arts' (music, film, theater, literature, etc.), art law, as traditionally defined, is concerned only with works of fine art and/or visual arts. Additionally, art law is closely related to, and often coincides with, the area known as cultural art property (GEORGETOWN LAW, 2021, online, our translation).

There is also the possibility of understanding Law as an object of Art, "[...] art being the form of representation of the historical forms of Law, especially through the statuary of justice, the symbols of justice, the painting of justice, the liturgy of justice, the architecture of the palaces of justice, constituting the so-called Legal Symbolism" (BITTAR, 2020, p. 22-23, emphasis added).

The relationship between Law and Art is interdisciplinary. After all, this movement, also called Law and Art, results from the interconnection between two branches of studies that, at first, may be seen as unrelated.

However, according to MASCARO, "[...] it occurs that, beyond this relationship of exteriority, there is an intimate and recondite connection between law and art: from the same social structures come the legal form and the form in which art is taken historically" (2015, p. 17).

Thus, it is in this last sense that the present work aims to analyze how Art can be used as a tool that can facilitate the study and understanding of Law. For this, the importance and relevance of this area of study will be analyzed, also seeking to understand the main challenges to make this union.

2 THEORETICAL REFERENCE

As a reference, the work of Marçílio Franca Filho is adopted, especially the work *Antimanual of Law & Art*, which he organized together with Geilson Salomão Leite and Rodolfo Pamplona Filho. This choice is justified because it is a work of reference in the area, seeking to strengthen the field of epistemology on Law and Art.

3 METHODOLOGICAL PROCEDURES

Regarding the methodologies used, deductive reasoning is employed (starting from the assumption that true premises must result in an equally true conclusion). The research is of the legal-comprehensive type, in which "[...] the analytical procedure of decomposing a legal problem into its various aspects, relations and levels is used. [These are researches that investigate objects of greater complexity and with greater depth]" (GUSTIN; DIAS, 2010, p. 28-29).

As for the materials, this is qualitative bibliographical research, which "[...] aims to know and analyze the fundamental theoretical contributions on a topic or problem, which makes it an indispensable instrument for any type of research" (HENRIQUES; MEDEIROS, 2017, p. 106).

4 RESULTS AND DISCUSSION

The study of different disciplines can be done through four different categories: disciplinarity, multidisciplinary, interdisciplinarity, and transdisciplinarity. Therefore, initially, "it is necessary to identify, conceptually, the differences between them. The idea of integration and totality that apparently permeates these concepts has different theoretical-philosophical references that are irreconcilable" (PIRES, 1998, p. 176). The exclusive study of a single discipline, with its own methods and objects, constitutes disciplinarity.

Multidisciplinarity seems to be exhausted in attempts by teachers to work together among disciplines in which each one deals with common themes from its own point of view, sometimes articulating bibliography, teaching techniques and evaluation procedures. It could be said that in multidisciplinary people, in this case the disciplines of the school curriculum,

study close together but not together. The idea here is the juxtaposition of disciplines (PIRES, 1998, p. 176, emphasis added).

In a next step, the interdisciplinary study is based on the proposal of performing an intersection of two (or more) disciplines, using different methods from a research object, which ends up being the link between the different disciplines, aiming at the perception of a phenomenon in a broader way.

Therefore, nowadays, it is very important that education professionals seek to provide this contact to students, allowing them to relate a theme to its various applications in different disciplines, allowing the understanding that the subjects are not isolated, but interconnected. In this sense,

The integration of theory and practice that interdisciplinarity deals with refers to comprehensive training from the perspective of totality. The critical thinking that inspires this discussion leads to a deeper understanding of this relationship, placing as fundamental importance the definition of the practice that is intended to relate to theory [...] interdisciplinarity can be taken as a possibility to break the rigidity of the compartments in which the disciplines of the school curriculum are isolated (PIRES, 1998, p. 177).

A next step to be aimed at is transdisciplinarity, which is not opposed to interdisciplinarity. On the contrary, it forms the basis of the former. It seeks to go beyond, being a theoretical principle that aims to remove the barriers between disciplines. Thus, it is understood that this theory is a "[...] suggestion of a new vision of knowledge, less compartmentalized and disciplinary. More holistic, with open systems capable of producing new science and new technologies" (DOMINGUES, 2003, online).

However, DOMINGUES makes an important caveat about this method: "We must understand that transdisciplinarity is still a kind of utopia, and positively value the term utopia, in the sense of non-place. That is, it has not been realized anywhere, but it is a search, a quest" (DOMINGUES, 2003, online).

Therefore, without too many pretensions, one can classify the study currently done on Law and Art by the interdisciplinary bias. The barriers between disciplines have not been definitively overcome, but they complement and interconnect each other.

One thought that may arise is: what is the object of Art that can be explored in this legal context? A sample list of the most common media includes music, architecture, sculpture, painting, theater, cinema, pop culture, literature (FRANCA FILHO, LEITE; PAMPLONA FILHO, 2016, p. 5-7).

It would not be compatible to establish a restrictive list. After all, Art can be understood as any artistic expression. This artistic language can be verbal, either written or oral, and/or non-verbal, that is, through symbols such as images, gestures, colors, etc. Thus, one can conclude that the limit of Art is the very limit of human imagination, not fitting its reduction to some specific categories (which, if it occurred, would collide with the interdisciplinary concept proposed).

Regarding the intersection between Law and Art, MASCARO explains that

The relationship between law and art must be taken in three instances. In the first instance, both derive from a common social-historical root. Law and art are configured, in contemporary capitalist societies, as forms crossed by the same commodity logic. Moreover, in the second of the instances of relationship, art is crossed by the legal form. And, even

more, in a third level of relations, it is necessary to ask about the possibility of the artistic form to go through law and, more specifically, justice (2015, p. 18).

Therefore, one of the great roles of Art, fostering its importance, is precisely to allow it to be an expression of reflection of social practices - whether past, present or imagined as they may be in the future. As a consequence, "if art is a manifestation haurida of the structures of the world, it somehow mirrors the contradictions and injustices of society, economy, culture and power" (MASCARO, 2015, p. 21). This occurs because artistic expression itself is a means of interpretation:

The artist cannot create anything without interpreting as he creates; since he is intended to produce art, he must have at least a tacit theory as to why what he produces is art and why it is a better work of art through the scribbles of the pen or brush or chisel rather than other means (DWORKING, 1982, p. 158, own translation).

Just as there is no way to limit the types of artistic expression, the legal connections are also countless. This interdisciplinarity is most often explored in the criminal (which even allows the comparison of the Brazilian judicial model with that of other countries), civil, family, environmental, constitutional, etc. spheres. In this last point, great themes that are constant objects of debate emerge: justice, fundamental rights and citizenship. Especially about the latter, BITTAR clarifies in his work that

Here we intend to work on the idea that the potency of citizenship can be explored in various ways, and that "the spheres and practices of the arts", as an arsenal of concepts, categories and experiences, can represent an important path (methods) for the creation, expression, interpretation and evaluation of concepts, sensibilities and sensations that are fundamental for expressing issues related to the struggle and conquest of rights, forms of injustice, exercise of citizenship, and protest against the violation of human rights (BITTAR, 2020, p. 27).

Art allows the visualization of different realities. Besides reflecting situations with which the audience identifies, this tool can even introduce unknown or un-experienced situations. After all, "each society creates its fictional, poetic and dramatic manifestations according to its impulses, its beliefs, its feelings, its norms, in order to strengthen in each one the presence and performance of them" (CÂNDIDO, 2011, p. 177).

From the moment of this contact, especially with what is different, some questions may arise as a result of the sensitization brought by Art. And in this, there is a development of reasoning and critical thinking, rethinking the Law applied and applicable to these cases. According to STRECK,

Literature helps to existentialize law. Therefore, what is always closer to literature is hermeneutics. Anguish, to be "treated", requires mediation. It demands the other. [...] For the law deals with this relationship we have with the world, with things. Democracy, social rights, citizenship: this occurs as an intermediated conquest. Literature does existential intermediation. Hermeneutics, in the sense that I work on it in the Hermeneutic Critique of Law, also. [It is not for nothing that Dworkin's central thesis is the chain novel to describe the response-sentence in law. The role of the interpreter-judge is to make adjustments (fit). This is the point where law and literature meet: in the treatment of epistemological anguish. The jurist, inserted in the theoretical common sense, does not know that he does not know. Literature metaphorizes this inconclusive relationship. It names things. It does things with words, as Austin would say.

[...] Philosophy has to be in Law. And not "of". And literature is at the existential core of Law. And not just for erudition or rhetoric (STRECK, 2018, p. 617-618, author's underline).

In other words, in studying this interconnection, Art is not seen as an object of Law but, effectively, as a new methodology that can be employed for its study and understanding. In an analogy made by CÂNDIDO to Literature, one can understand Art as a "powerful instrument of instruction and education, entering the curricula, being proposed to each one as intellectual and affective equipment" (CÂNDIDO, 2011, p. 177). From this, then, arise some problems for its effective application.

First of all, interdisciplinarity between Law and Art requires access to culture on the part of those who will use this methodology. After all, it is necessary to know the Art (in a broad sense) that will be related to some institute of the legal system. As a consequence, this demands constant professional updating, both of the norms (and their changes), and access to the works that will be referenced as an example.

Secondly, despite being an increasingly studied branch, its systematization is still lacking, either to define methodological strategies that bring greater benefits to this intersection, or even to perhaps reach the conclusion that there is no way to pre-define methods. As Art is a free expression, with the increase of practice, the hypothesis arises as to whether its relationship with Law may also not be subject to pre-established methodologies, and should be adequate to each case. On the other hand, this demands a greater ability from the professional who uses this methodology.

Thirdly, it is not enough for the professional to have access to this cultural acquis if his peers or the public do not have the same access to this content. In this sense, it was seen that the right to Art is constitutionally provided. However, in practice, how is it implemented in relation to other fundamental human rights? For CÂNDIDO,

On this point people are often victims of a curious obfuscation. They say that their neighbor is certainly entitled to certain fundamental goods, such as a house, food, education, health, things that nobody well-informed admits today are the privilege of minorities, as they are in Brazil. But do they think that their fellow poor would be entitled to read Dostoevsky or listen to Beethoven quartets? Despite their good intentions in the other sector, perhaps this does not cross their minds. And not out of spite, but only because when they list their rights, they do not extend all of them to their fellow human beings. Now, the effort to include our fellow men in the same list of goods that we claim is at the basis of reflection on human rights (CÂNDIDO, 2011, p. 174-175).

A fourth essential point about the application of Law and Literature as an educational and cultural tool focuses on some problems related to the authors themselves, from the care to avoid violation of copyrights, but also with regard to the implication arising from the chosen intersection.

After all, what if the example runs counter to the work being analyzed, or if it is applied with a purpose different from the author's original proposal due to differences in interpretation, or if it is used to defend something that the original author would feel offended by? This could be reflected in the scope of the personality right with patrimonial reflexes, as in the case of moral damages suffered by the author or

by those legitimized in the sole paragraph of art. 12 of the Civil Code ("surviving spouse, or any direct or collateral relative up to the fourth degree"). Still in relation to the author, whoever mentions his work must pay attention to his biography, in addition to the content itself.

From these considerations, we seek to bring contributions to the Law and Literature branch, since "this epistemological area is, in fact, in a phase of maturity, in which its universal academic acceptance begins to be verified" (CUNHA, 2016, p. 10).

The origin of this strand stems mainly from the union between Law and Art with the *Law and Literature Movement* in the 1970s in the United States, with repercussions in Europe. According to LYRA,

Thus, renowned authors such as Sophocles, Aeschylus, Shakespeare, Kafka, Dostoievski, Proust, Molière, Jane Austen, Tolstoy, Mark Twain, among others, had their immense contribution to the legal universe recognized with the publication of the text -The Legal Imagination. In this context, literature begins to act as an intercessor, promoting debate and critical thinking in Law against the backdrop of the issues brought up by the respective literary writings. On the other hand, legal acts, especially in Procedural Law, take on an aesthetic dimension through which they come to be seen as a representation. As a legal narrative, the rhetorical discourse takes on an outline similar to a literary piece (2016, p. 141-142).

In Brazil, there was no such influence from the United States. Some of the first interdisciplinary studies were made by Lemos Britto (1946), Aloísio de Carvalho Filho (1959), Raymundo Faoro (1974) and Eliane Botelho Junqueira (1998). However, MONTEIRO points out that "[...] there is a resistance in affiliating such authors with the *Law and Literature Movement*, as both would have less legal than political or sociological purposes" (2020, p. 73). This, then, justifies the reason for

some researchers attribute to Arnaldo Sampaio de Moraes Godoy the pioneering spirit in Brazil, in view of his Master's dissertation defended in 2000 and published in 2002 under the title *Law and literature: anatomy of a disenchantment: legal disillusionment in Monteiro Lobato* (PRADO, 2007). In 2005, Luis Carlos Cancellier de Olivo analyzed William Shakespeare legally, commenting en passant on Junqueira and Godoy's contributions in *O estudo do direito através da literatura* (2005) (MONTEIRO, 2020, p. 73, author's underline)

However, since the 1980s, studies in this area have been done at the Federal University of Santa Catarina, even if it did not call itself part of such movement (MONTEIRO, 2020, p. 73). In this context, some exponents who started this current of studies in the country are Luis Alberto Warat, Luiz Carlos Cancellier de Olivo, Dino del Pino and Lênio Streck (STRECK, 2018, p. 616).

However, this methodological approach, although very useful for teaching Law, need not (and should not) be restricted to the field of teaching. This is because just as Art is a constitutional right for all, Law is an element present at all times in the lives of citizens.

Thus, this intersection can be an important tool in helping the dissemination and understanding of various legal institutes through artistic language, its differentiated approach and the sensitization it instills in the public.

Thus, one may ask: by what means is it possible to start studying Law and Art? How is it possible to access this content? Besides books such as *Semiotics, Law & Art: between theory of justice and theory of law*, *Antimanual of Law & Art* and *Antimanual of Law & Art*, there are some other initiatives in the country that work with this interdisciplinarity.

Regarding periodicals, there is the *Revista de Direito, Arte e Literatura* (Law, Art and Literature Journal), edited by CONPEDI (National Council for Research and Post-graduation in Law), and *ANAMORPHOSIS - Revista Internacional de Direito e Literatura* (International Journal of Law and Literature), edited by RDL (Brazilian Network of Law and Literature, founded by Lênio Streck). On the YouTube channel of "TV e Rádio Unisinos" and on TV Justiça (Justice TV), Professor Streck publishes videos in his *Law & Literature* program. In a more restricted scope, one can list the work of IBDFAM (Brazilian Institute of Family Law) that publishes podcasts on the Spotify and SoundCloud platforms with the title Family Law & Art.

It can be noticed, then, that this Law and Art movement tends to expand more and more, either as a teaching methodology, as an epistemological tool and as a link with the population.

5 FINAL CONSIDERATIONS

The Law and Art movement is an interdisciplinary teaching methodology, performing a true intersection between disciplines so that the same object of study is analyzed from different perspectives and with its various reflections.

Access to culture is a constitutional right and, as Law is an element that is present on a daily basis, this tool allows not only to improve teaching in Law, but also to ensure an approach to a larger public that tends to benefit from this knowledge. Art, whether by the way it is exteriorized, reflects the society in which it is inserted, brings questions and encourages discussions.

Therefore, this paper sought to understand what this movement consists of, its origins, its main exponents, as well as the benefits that can be achieved and the difficulties that must be faced with regard to its realization in practice.

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CHAPTER 21

Virtual teaching, a global educational need

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ABSTRACT

With the arrival of COVID-19, the world suffered unexpected impacts. It forced countries to make accelerated changes in different aspects; of course, education was affected too. On this latter point, UNESCO reveals that approximately 94% of students

in the world were harmed by the suspension of face-to-face classes. To counteract the effect of this conjuncture, the education sector implemented virtual teaching through existing technological tools. The speed with which the educational system had to adapt to this modality raised questions about the management and functionality of virtuality in education.

The purpose of this document is to analyze the need of adopting virtual teaching with the change of pedagogical strategies and to evaluate the digital skills that teachers need to adapt to virtual education, taking advantage of technological resources for the motivation of the student and their access to education. The descriptive method of documentary type and the analysis of the contents were used to process the information. Finally, we conclude on the importance of teaching work that, with a positive attitude towards technology, this has to rethink its role as a facilitator of the educational process and the fundamentals of the appropriation of digital tools.

Keywords: Virtual teaching, Pedagogical strategies, Peaching digital skills.

1 INTRODUCTION

The sudden appearance of COVID-19 brought as a consequence very difficult times for all countries worldwide and education was no exception; all educational management bodies were forced to close their doors and suspend face-to-face academic activities as a preventive and sanitary measure to avoid the spread of the pandemic (Valero-Cedeño et al., 2020). However, these provisions had a direct impact on the education sector and especially on students. Data from UNESCO (2020) reveal that 1.6 billion students at different educational levels around the world were affected by the suspension of face-to-face academic work, a figure that represents 94% of the total global student population. Likewise, in Peru, according to the Ombudsman's Office (2020), more than 8 million students were affected in their studies due to the health crisis.

Given the complexity of this context and education being a fundamental right of every human being, it has to be guaranteed and prioritized by the State (Amuchástegui et al., 2017); in view of this primary need, virtual education was implemented as a relevant alternative for the continuity of the educational service (Castillo and Cabrera, 2021), using and modifying its structure, generating new learning scenarios

(Valero-Cedeño et al., 2020; Crisol-Moya et al., 2020; Basantes et al., 2018; Cabrera, 2019) likewise, making use of digitalization as a powerful, present and future strategy (Ahmadi and Nourabadi, 2020; Gil et al., 2020).

Undoubtedly, the pandemic by COVID-19 represented the breaking point for the implementation of virtuality in the educational system, since being a primary pillar of our society, it had to adopt in a very accelerated way the digital culture as a fundamental part of its structure (Martínez-Garcés and Garcés-Fuenmayor, 2020), to adapt and respond assertively to a globalized community in technology and digital information in record time (Cabrera, 2019).

On the other hand, Ojeda-Beltrán et al., (2020) and Arango et al., (2020), refer that depending on the level of digital skills and the impression they get from the digital tools for their learning, students will be able to value their contribution or difficulty of the learning they receive in the virtual modality. Under this premise, teacher training processes have to focus on the management of technological tools, being necessary to create optimal pedagogical strategies for educators to interact with learners (Mahdiun et al., 2017; García-Chitiva, 2020).

In that line, Basantes et al., (2018) point out that, we are facing a situation of parallelism of attitudes towards technology. We identify students, who have a technological lifestyle, as digital natives; while teachers are considered people who immigrate to the digital, so that appropriating technology will demand an extra effort to develop teaching-learning strategies in their different contexts. This is how students and teachers assume their new digital role in the pedagogical journey (Valero-Cedeño et al., 2020). In addition, Crisol-Moya et al., (2020) consider the importance of personalized teaching through unlimited connectivity strengthened with coexistence in the network for bidirectionality of information, digital interaction should be given to all equally, providing a virtual educational space where technology joins pedagogy to achieve the standard of quality in educational development. To this end, it is essential to take into account some basic conditions for its application such as the home study space; connectivity availability, technological academic support, syllabi adapted to the new virtual teaching and the digital competences of teachers and students (Aquino-Canchari and Medina-Quispe, 2020).

In view of the above, the purpose of this article is to review and analyze the existing literature on the need to adopt virtual teaching with the consequent change in the teacher's pedagogical strategies based on virtuality and to examine the new skills or competencies that teachers must develop to maintain the teaching standard to which their students were accustomed; it is also important to evaluate the change in the dynamics of communication and teacher-student interaction in this new teaching space called virtual classroom, to determine the new role that virtual teaching represents in the life of any student.

In order to achieve this objective, we consider it convenient to pose the following research questions:

What is understood by virtual education?

What changes have pedagogical strategies undergone in virtual education?

What competencies should teachers develop for effective virtual teaching?

2 METHODOLOGICAL STRATEGIES OR MATERIALS OR METHODS

Taking into account what Reyes (2020) mentions, a review article is a retrospective evaluation of the collection of research studies on a topic of valuable interest for the general public or a specialized one. It seeks to find the truth, the extent of the sources examined, the expertise of authors on the subject under review and the pertinent recommendations for the environment in which they will be applied. We can see that it is a review to which we must give due attention from its planning and subsequent evaluation. Likewise, Gómez-Luna et al. (2014) define it as "The literature review or state of the art corresponds to the detailed description of a certain topic or technology" (p. 1) and also states that "A literature search should be done from a structured and professional perspective" (p. 2).

The search for information is an activity as old as man himself, nowadays there is a lot of information on the networks, so it is necessary and essential to use search systems that are very efficient (Codina, 2018). In this research path that begins with the planning phase, Reyes (2020) refers that the authors determine their primary sources in their review: the databases they consulted, the "search engines" or "key terms" used, the selection criteria: inclusion and exclusion, the languages in which they were published, the stage of time to which their review was limited. All this will result in a pertinent evaluation phase with expected results.

For the above mentioned, for the preparation of this article, bibliographic searches were conducted by exploring scientific articles related to the following keywords: "virtual teaching", "pedagogical strategies", "digital teaching competencies", "virtual education", "virtual education", "virtual education", taking as reference the nationally and internationally recognized databases such as Google Scholar, Dialnet, Scielo, Scopus, Ebsco.

The bibliographic manager Mendeley was used to organize the information, which allowed the storage of the information in a virtual library and facilitated the writing of citations and bibliographic references following the APA norms.

The process began with the planning phase, where the objectives of the research were defined, to then determine the databases to be used and a bibliographic manager for the citations and references based on the APA norms, the strategies for the literature search were defined, using the above-mentioned search engines and taking into account the inclusion and exclusion criteria. The inclusion criteria were defined as follows: 1) Articles that were published between the years 2017- 2021, 2) Articles published in English and Spanish, 3) Articles published in congresses, 4) Open access articles. The exclusion criteria defined were: 1) Articles published in languages other than English and Spanish, 2) Articles published until 2016, 3) Articles that are not open access, 4) Articles that have no relation with the study variable, 5) Theses.

Subsequently, the evaluation phase was carried out by searching the information in the aforementioned databases, selecting the articles that adapted to the proposed criteria and filtering those

articles according to the exclusion criteria. Out of 120 articles reviewed, 46 articles were selected, that is, 38.3% that met the inclusion criteria. In addition, a detailed review process of the titles, summaries and conclusions of the selected bibliographic reviews was implemented, as well as a thorough analysis to extract the relevant information from the results, which will help us to answer the research questions initially posed.

3 RESULTS AND DISCUSSION

3.1 VIRTUAL TEACHING

Nowadays, the virtual teaching modality has increased its popularity because it uses the Internet and other technological tools as a means of transmission of educational content, offering multiple benefits for all actors in the educational process. In the current learning scenarios educational technologies predominate, education is dependent on virtual teaching, and allows better results in the educational process, so we have that, virtual teaching not only makes use of technology, but depends completely on it, making the Internet its indispensable channel (Fajardo and Cervantes, 2020).

Therefore, from the definition of virtual education, Tabatabai (2020) considers it as the transmission of pedagogical contents, without interferences of distance or temporality, through the different technological resources used in the communication of the teacher-discussant duo; an opinion shared by Expósito and Marsollier (2020), who add that virtual education establishes a different scenario for teacher-discussant communication, in addition, the use of technological resources originates novel ways of application and interrelation according to each context. Tabatabai (2020) considers new educational technologies based on simulation, which are managed from software and hardware, ensuring the potential of virtual education. Perissé (2020) states that the virtualization imposed by the health crisis, marked the accelerated development of the digital era. In this regard Pomar and Rivero (2020) argue that virtuality has managed to sustain the educational process of students synchronously and asynchronously, using the few technological tools that they knew and that initially have given positive effects, but that digital competencies need to be strengthened to improve educational quality. This idea coincides with Ayala and Drozinsky (2020) who also highlight the benefits achieved so far under this system. For Gil et al. (2020), properly executed virtual education can successfully replace face-to-face education in times of crisis, but also recognizes the vulnerability due to the change that arose when abruptly migrating to virtuality, which emphasizes the inequality of opportunities and community responsibility. Varguillas and Bravo (2020) agree that the benefits of virtuality, including from a humanistic perspective, are valued by students because it facilitates access to educational innovation and incorporates the use of ICTs for comprehensive learning. From this point of view, virtual teaching is more than valuable praxis spaces and laboratories that enhance their academic performance; it is a profound triad of education, communication and technology used to teach. Llorens et al., (2021) consider the importance of the use of ICT in this era of knowledge, being an essential part of the reform of educational methods that society needs to evolve; therefore, teachers must implement a paradigm shift from traditional education (Domínguez et al., 2017).

Puerta et al., (2020) state that virtuality is a way to attract the learner to education, or bring education to the learner. Area-Moreira et al., (2020) shows us in his study of the University of La Laguna, a project called "Flexible environments of virtual and blended learning" which proved very adaptable to the abrupt change during the confinement by Covid 19, this experience allows him to conclude that virtual teaching is very effective and successful, but above all it is the means that can ensure the continuity of educational service in times of crisis. Virtuality allows us to discover and inquire into an intangible universe that houses a numerous amount of information that does not depend on a specific space (Dominguez et al., 2017).

On the other hand, Varguillas and Bravo (2020) recognize the barriers that virtuality represents for the educational community, some students deal with the lack of connectivity or access to technology, while teachers are affected by their deficiency regarding digital competencies compared to their students; in fact, in a research conducted by Llorens et al, (2021) found that the highest percentage of students in all the groups included in the study have digital competencies, which shows that they belong to generation Z, i.e. they are naturally linked to the virtual world and consider it part of their daily lives. Additionally, the study by Tejedor et al., (2020) confirms the perspective of both educational agents regarding virtual education; on the one hand, students visualize a weak technological training of their teachers, and these in turn affect the need to enhance awareness and decision capabilities regarding the use of digital tools in students; these skills are intended to instill in the educational community a proactive digital culture and the ability to achieve quality education.

3.2 PEDAGOGICAL STRATEGIES IN VIRTUAL EDUCATION

Virtual education brought innovation at the methodological and pedagogical level and even at the organizational level, increasing institutional communication links and the adaptation of all those involved to this new digital era (Martínez et al., 2018). As stated by Córdoba, et al., (2018) communication can occur both synchronously and/or asynchronously, the important thing is that it serves as a basis for monitoring the progress of the learner. However, achieving a satisfactory learning process depends significantly on the performance of the teacher and the use of pedagogical strategies that best suit the situation, mainly taking into account the learners and the technological progress that the world is going through. Sandoval (2020) points out as pedagogical strategies the "useful tools" or actions of the teacher that allow transforming the information to present it in a way that is accessible to the student's understanding. In other words, pedagogy is a crucial aspect for any educational modality, Martínez et al., (2018) grant the following definition: "[...] pedagogy should be understood as a process that transcends the generation of knowledge, forming integral subjects that recognize their environment and their own individuality." (p.3)

In order to originate an educational process, the teacher must establish a programming or work plan to generate learning, this implies deciding the approach and suitable resources to transmit the previously determined knowledge and fundamentally for the student to internalize it, where a determining part of the planning are the pedagogical strategies (Sandoval, 2020); thus, a student who uses the Internet on a daily

basis does not mean that he is part of the educational process (Fajardo and Cervantes, 2020). As shown by Quezada et al., (2021) in the results of their study, 39% of teachers believe that they were able to adapt their pedagogical system to virtuality, 25% required changing their teaching approach, 23% assumed virtuality as an effect of the knowledge era and 13% stated the importance of acquiring digital competencies to provide a better education; these findings demonstrate the demand of virtual educational dynamics.

Chinchay et al. (2020) consider that virtual environments are constituted from the various curricula added to the computer tools currently available. Technology drives students' initiative for the external search for knowledge throughout their learning process, but simultaneously allows them to rethink their previous knowledge internally with critical thinking and open to new learning; all this shapes the unique learning style of each student in this virtual environment, which is also influenced by their teachers, the pedagogical strategies of the educational program, the institution to which they belong and the quality of technology they can access.

Chong-Baque and Marcillo-García (2020) state that, in order for students to develop the necessary skills, attitudes and knowledge, the teacher must plan systematic actions to guide the learning process, which are called pedagogical strategies; these must be adapted to the different contexts and realities of the students, so as to awaken their interest through new experiences. Currently, the addition of technological tools to education demands a great change in the teaching style, since virtual pedagogical strategies must be student-centered and, above all, must be based on the level of technological mastery of the students. Thus Camarillo and Barboza (2020) comment on the success of the experience of law students at the Universidad Autónoma de Ciudad Juárez in virtual spaces, which lies in the students' effort to relate the information acquired and their previous knowledge, this through intrinsic cognitive processes that are linked to the sociocultural environment, allowing them to assimilate knowledge substantially. From which we can conclude that the teacher needs to nurture the motivation of the student to deepen the topics taught, making them reflect on the importance they mean in their daily, personal and academic life; in addition, as a mediator teacher's role to promote a profitable communication space, it is important to develop the cognitive and linguistic skills of the students for their proper interrelation during the management of the various interactive media, so that allows them to develop a criterion of selection and use of information to build their ideas.

For all that has already been developed, we can affirm that pedagogical strategies in the virtual scenario should result in an interesting and creative journey that teachers and students travel together, taking advantage of the students' familiarity with technology. We are facing a great demand for distance education, therefore its structure must be built on both levels, both in the internal educational community and in the extension of the scope of education.

3.3 TEACHER AND LEARNER COMPETENCIES FOR VIRTUAL EDUCATION

Among the competencies that teachers should develop when implementing virtuality in the teaching process, a key factor to take into account is the human dimension, since morals and ethics allow changing,

developing and integrally improving education. (2021), when studying the elements that guarantee the success of cyber coexistence, arrived at the following results: 17% prioritize respect as a key to harmony within the virtual educational community, 23% emphasize the importance of broad and direct communication, 31% express the need for empathy, 15% promote solidarity, 6% point out collaboration for common goals and 8% agree that information transparency should be revalued. In addition, the author warns that in order to combat the growth of the digital divide, codes of ethics must be restructured to take into account the current digitalization.

Aguilar (2020) insists on highlighting the self-management, analysis and the active and humanized educational process that can be achieved by promoting digital tools with proper management. Therefore, Domínguez et al. (2017) point out that it is vital that teachers are trained in the use and mastery of tools to use technologies, and can guide the access of learning to their students. In addition, Tabatabai (2020) emphasizes the importance of determining the digital requirements that teachers must have to manage their implementation in their professional development: online training and the use of communication tools such as videos, audios, chats and web, zoom, Skype, Google Hangouts Meet, among others.

Along the same line, Tejada and Pozos (2018) state that a teacher achieves digital competence when handling technological tools, he/she is able to develop the process of construction, production and evaluation in a creative way governed by his/her own rules. Digital competence is a process that goes through literacy and practice of it, reaching creative originality as a consequence of their professional development. To achieve the aforementioned skills we have to consider that there are some important situations pointed out by Cabero-Almenara and Palacios-Rodríguez (2020) which can influence in a relevant way on teachers when we talk about digital competence. First, understanding that, in order to achieve a competency, it takes time, that is to say, it is done step by step, and even more so when we talk about digital competencies. Second, the progress to achieve digital competencies is personal, therefore, teachers are at different levels of digital competencies and probably not all reach the highest level of digital development. Here is the challenge for education, especially for the teacher, who must extend his training in a conscious and collaborative way in the process of his life, to obtain more information, but with the ability to manage it in the most updated versions, according to our digital evolution.

It should be noted that, over time, the term digital competence has gone through different models, in the search to obtain the scope of its competence. Tejada and Pozos (2018) refer that, although there is no consensus profile on the formation of digital competence in teachers, it is essential to develop them in digital skills, in order to then adapt them to their pedagogical training in the teaching process. Teachers require comprehensive thinking when training themselves to transform into the digital world.

Reviewing the literature of Tejada and Pozos (2018), they mention in their study the reference of the model designed for digital integration in the development of teachers; considering their development over time, articulated them in three stages, the basic level focused by the approach and incorporation of digital skills in the performance of teachers, i.e. reaching a literacy: knowledge and understanding of ICT,

establishing educational capabilities; the level of deepening, allows progress through exploration and deep experimentation of ICT, adapts them in their teaching work with high levels of skill and sustainability, manages an extensive and valuable collection for its teaching strategy and evaluates its scope in different learning situations; and finally the level for the generation of knowledge, of superior scope for the teacher, being relevant the creation of knowledge aimed at innovation and creativity in the educational work and with projection to the social environment. Thus, we can affirm that the evolution of the stages is profound, the teacher learns and applies ICT and progressively incorporates them in his work through critical reflection, as a fundamental part of the procedure.

From the Latin American perspective, Martínez-Garcés and Garcés-Fuenmayor (2020) refer that digital competence is the teacher's mastery in the understanding, application and critical evaluation of digital and communicative tools, supported by didactic and pedagogical, ethical and moral standards. These authors relate discipline, pedagogy and technology in a digital competence, and consider literacy, inquiry, communication, preparation and production of arguments adapted to the digital era, safety in this era and daily problem solving, as the scopes that teachers should develop to achieve digital competence. Given the above list of scopes, how do teachers perceive and accept them? Regarding the acceptance and development of digital competencies in teachers, we question whether assimilation is late, teachers would have disadvantages at the beginning, but technology allows everyone to benefit from its versatility to adopt it and make use of its virtues while minimizing its drawbacks. Levano-Francia et al. (2019) point out that adopting digital competencies is to have the most useful and measurable results of the professional teacher training process in relation to the digital environment.

Padilla (2018) clarifies that the attitude of teachers towards technology depends a lot on their positive appreciation to include it in the learning process of the student in a dynamic way, but if it is negative they will refuse the transition; that is why teachers' attitudes are vital in the implementation of technology in the virtual classroom, but managing their beliefs radically with respect to technology will impact their results in a valuable way at the time of exercising their virtual teaching. Zambrano (2020) demonstrated in his research the relationship between digital skills and emotional intelligence of teachers, which points out that the more technological skills they have, the better management of emotions they have and vice versa, a scenario that causes a real impact on the teaching-learning process at this juncture. Zempoalteca et al., (2017) noted that the elements that teachers have in front of technology are related to age, access to technological resources, lack of support to understand the digital culture in education, security in a formal training in digital skills and the academic degree achieved by each teacher. Therefore, it is argued that initially an analysis is required in the process of digital knowledge and awareness in their attitude about their new role, as well as the scope provided by the management of technological tools in their virtual teaching, especially favoring the education of their students. In view of this comment, Camino and Maure (2020) point out that the provision of technological resources and a good educational use of them would promote the reduction of the differences between school and society.

4 CONCLUSION OR FINAL CONSIDERATIONS

From the results found, we can reach the following conclusions:

- Virtuality has revolutionized education in different aspects, both methodologically and pedagogically and even institutionally, because it has allowed to break down the limits of distance and temporality, being very effective to ensure educational continuity in times of crisis; however, it highlights the existing digital divide.
- Virtuality has almost completely restructured the role of the teacher, as he/she needs to develop more and more competencies, making virtual teaching a demanding challenge. In addition to pedagogical skills, digital skills must be added, and the approach to human skills such as the practice of ethics, empathy, respect, and communication skills must change, so that they are adapted to a virtual environment. The only use of digital resources does not contribute if they are not provided with the purpose of the teacher in their objectives, content and methodology to work with their students.
- For teachers to be able to connect effectively with their students through technology, it is crucial that they are trained in digital competencies; This does not mean that all teachers must reach a very high level of digital mastery, because each one must advance at their own pace, it depends on different factors such as their attitude towards technology, their management of emotional intelligence and their level of prior knowledge, the important thing is that they feel confident with the level they achieved; so Quiroga and Nappa (2020) state that the challenge for teachers is to develop the skills to learn, think and create in the new digital environments.
- In the virtual modality, teachers and students do not share the same physical space, it is essential that educators manage to encourage their students to develop cognitive and linguistic skills and the necessary criteria to search and choose the information they need, in order to allow them to have greater autonomy in their learning process. Students' learning is mediated by teachers, through interaction, the Educational Institution where they are, their socio-cultural environment and the technological tools at their disposal. Consequently, the appropriation of digital media becomes a constructive educational experience and requirement (Córdova et al., 2018).

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CHAPTER 22

Resistance profile of the most prevalent microorganisms in urine cultures at the Laboratório de Análises Clínicas Adolfo Lutz

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ABSTRACT

Urinary tract infection (UTI) is defined as microbial colonization and tissue invasion of some site of the genitourinary tract (GUT), capable of overcoming the defensive capacity of the host and causing injury. (Menin and Grazziotin, 2010). The main objective was to study the resistance profile of the most prevalent microorganisms in Urocultures at the Laboratory of Clinical Analysis Adolfo Lutz - FUNEC/CENTEC in order to have an overview of the resistance pattern of these microorganisms against the antibiotics used for the treatment of infections. During the study period, 316 urine cultures with antibiogram were performed in the clinical analysis laboratory Adolfo Lutz, FUNEC, UNIDADE CENTEC in Contagem/MG. Among these, 20.89% (66) presented a positive result, that is, microbial growth equal to or greater than 100,000 cfu/mL, with females being the most affected (83.34%). *Escherichia coli* was the microorganism with the highest incidence, followed by *Staphylococcus aureus* and *Klebsiella pneumoniae* and in relation to the resistance profile of the isolated strains of *Escherichia coli*. A high level of resistance was observed for Ampicillin, Amoxicillin/Clavulanic Acid, Sulfametaxazole-Trimetropin, Nalidixic Acid, Cafazoline and Tetracycline respectively.

Keywords: Antibacterial agents, Bacteriuria, Prevalence, Antibiotics.

1 INTRODUCTION

Urinary tract infection (UTI) is defined as microbial colonization and tissue invasion of some site of the genitourinary tract (GUT), being able to overcome the host's defensive capacity and cause injury (MENIN and GRAZZIOTIN, 2010). According to Junior (2013) evaluating the microbial prevalence in urine cultures, describing patient characteristics in addition to the antimicrobial sensitivity profile of

positive samples at HUAC Hospital Universitário Alcides Carneiro (Alcides Carneiro University Hospital), in Campina Grande-PB, realized that of the 554 urine cultures performed, 124 (22.4%) were positive for microbial growth. In the outpatient clinic *Escherichia coli* showed the highest prevalence (61.8%), followed by *Klebsiella pneumoniae* (8.8%). In the hospital, the most prevalent was *Klebsiella pneumoniae* (27.8%) followed by *Escherichia coli* (26.7%). Ampicillin showed the highest percentage of resistance in the outpatient and inpatients, against antibiotics such as nalidixic acid, sulfamethoxazole/trimethoprim, fluoroquinolones, cephalosporins, sulfamethoxazole/trimethoprim, quinolones, monobactams, ampicillin/sulbactam, cephalosporins, carbapenems, and aminoglycosides. According to Dias and Monteiro (2010), the belief that the problem of bacterial resistance will be overcome with the discovery of new drugs is for many, more practical than the design of interventions to contain its evolution. The rational use of antibiotics is fundamental to avoid microbial resistance. Based on the above, it is of utmost importance to develop a project with the general objective of studying the resistance profile of the most prevalent microorganisms in urine cultures in the Laboratory of Clinical Analysis Adolfo Lutz - FUNEC/CENTEC, in order to have an overview of the resistance pattern of these microorganisms against the antibiotics used for the treatment of infections.

2 THEORETICAL FRAMEWORK

Urinary tract infection (UTI) is defined as microbial colonization and tissue invasion of some site of the genitourinary tract (GUT), being able to overcome the host's defense capacity and cause injury. (Menin and Grazziotin, 2010).

The species of intestinal flora most frequently associated with urinary tract infections is *Escherichia coli*. In fact, this species is responsible for 80 to 90% of community-acquired urinary tract infections. Urinary tract infections usually occur via the ascending route, i.e. the *E. coli* from the intestines reaches the urethra, then passes into the bladder, and eventually the upper urinary tract. Because of the short distance between the anus and the female urethra, urinary infections are more frequent in women. The *E. coli* includes a large number of strains, but only a few are pathogenic for the urinary tract. These are characterized by the presence of adhesion fimbriae and the production of hemolysins. Urinary flow, anatomical or even functional changes are important factors in the genesis of urinary tract infections (TRABULSI and LTERTHUM, 2004).

According to Lopes et al. (1998) evaluating the changes over more than a decade (1983-1994) in the frequency of resistance to norfloxacin and ciprofloxacin in bacteria isolated from urine cultures, data show a gradual increase in the frequency of this resistance among the most common bacteria isolated in urine culture tests.

Santana et al (2012) studying the resistance profile of *Escherichia coli* and *Klebsiella* spp isolated from urine cultures from a community in the city of São Luis-MA in the period 2005-2008, concluded that in relation to the susceptibility to antimicrobials, *E.coli* and *Klebsiella* spp showed a high resistance rate

(75.6%) to amoxicillin/clavulanic acid and nalidixic acid (82.5%), suggesting the non-use of these antibacterials in the treatment of urinary tract infections.

According to Magalhaes et al (2010), the profile of bacterial resistance to the two quinolones tested, ciprofloxacin and norfloxacin, was similar in the studied urine cultures, with *E. coli* showing significant resistance to these two antimicrobials (20,85%).

Oliveira and Lacerda (2017), studying the resistance profile of the most prevalent microorganisms in urine cultures at the Laboratório de Análises Clínicas Laboranálise (Clinical Analysis Laboranalysis Laboratory) -in Sete Lagoas, Minas Gerais in the period from August 2015 to July 2016, noticed that in this period, the microorganism most frequently isolated was *Escherichia coli* (58.8%). The most affected gender was female (85.6%) and the age group with the highest occurrence was 18 to 30 years (24.9%). The enterobacteria were more resistant to the antibiotic Ampicillin followed by fluoroquinolones of first and second generation, while the carbapenems were the class with the lowest incidence of resistance. The pattern of resistance found in this study confirms the importance of developing regional studies to contain the main agents that cause UTIs and their pattern of resistance.

When analyzing 2,433 positive urine cultures performed in the microbiology laboratory of the University Hospital of Brasília, Pires et al. (2017) noticed that *Escherichia coli* was the most isolated bacteria (62.4%), followed by *Klebsiella pneumoniae* (6.8%) and *Proteus mirabilis* (4.7%). *Escherichia coli* showed higher sensitivity to amikacin (98.6%), gentamicin (96.2%), nitrofurantoin (96.3%), and the quinolones ciprofloxacin (90.9%) and norfloxacin (89.8%), with low sensitivity to sulfamethoxazole-trimethoprim (50.6%). The other bacteria showed similar sensitivity pattern, concluding that *Escherichia coli* was the most isolated bacteria, being highly sensitive to aminosides, nitrofurantoin and quinolones.

From the 616 medical records, Salton and Maciel (2017) identified 55 (9%) of cases as significant bacteriuria in urine cultures from patients in a city in the interior of Rio Grande do Sul. The main pathogen present in the urine cultures was *Escherichia coli* with 70% (38), followed by *Staphylococcus aureus* with 21% (12) and *Enterobacter* spp. with 9% (5). Female patients were the most affected, representing 87% (48) of the cases. Regarding the age range, there was a higher prevalence of significant bacteriuria among individuals between 61 and 80 years of age, 40% (22). Regarding resistance profiles, 29% of *E. coli* showed resistance to sulfamethoxazole-trimethoprim, 17% of *S. aureus* showed resistance to the antimicrobials nitrofurantoin and sulfamethoxazole-trimethoprim, and 40% of *Enterobacter* spp. showed resistance to clindamycin. The data allowed us to conclude that in this study there was a high prevalence of significant bacteriuria in women, as well as in an age range of 61 to 80 years. The main pathogen found was *E. coli*, followed by *S. aureus* and *Enterobacter* spp. Regarding antibiotics, a high index of resistance of *Enterobacter* spp. was observed, followed by *E. coli* and *S. aureus*.

In a study on the antimicrobial resistance profile of urinary tract infections in women treated at a tertiary hospital in Vitória, ES, Filho et al. (2013) concluded that the antibiotic with the highest resistance

rate, both for *E. Coli* (44%), as well as for the other microorganisms (16.6%), was ampicillin, also observing a significant trend of resistance of *E. Coli* to ciprofloxacin throughout the months studied.

According to Dias and Monteiro (2010), the belief that the problem of bacterial resistance will be overcome with the discovery of new drugs is, for many, more practical than designing interventions to contain its evolution. The appropriate use of antibiotics is of crucial importance for the maintenance of population health and for an efficient use of resources in health care provider systems. The rational use of antibiotics is relevant for patients, healthcare professionals, policy decisions, as well as the pharmaceutical industry.

Based on the above, it is of utmost importance to develop a project with the general objective of studying the resistance profile of the most prevalent microorganisms in urine cultures in the Clinical Analysis Laboratory Adolfo Lutz - FUNEC/CENTEC.

3 METHODOLOGY

The study will be descriptive, retrospective and documental, based on information from data extracted from the GLAB, SISLAB and SILAC (HB) programs made available by the Adolfo Lutz Clinical Analyses Laboratory of FUNEC/CENTEC in the period from 04/01/2003 to 05/10/2021.

The target population of the study will consist of patients confirmed by urine culture tests at the Adolfo Lutz Clinical Analysis Laboratory of FUNEC/CENTEC. The data collected will be statistically analyzed in simple tables and graphs, with absolute and percentage frequency.

The project will be developed by analyzing the following parameters:

Number of positive urine cultures

Quantity by gender and age group

Main microorganisms isolated

Main antimicrobials tested

Resistance or Sensitivity to the antimicrobials tested

4 RESULTS AND DISCUSSION

During the period studied, 316 urine cultures with antibiogram were performed in the Adolfo Lutz Clinical Analyses Laboratory of FUNEC, CENTEC UNITY in Contagem, MG. Among those, 20.89% (66) were positive, i.e., microbial growth equal to or higher than 100,000 CFU/mL (Table 1), and females were the most affected (83.34%), as shown on table 2.

Table 1 - Total of urine cultures performed

Total Urine culture	316	100%
Negative Cultures	250	79,11%
Positive Cultures	66	20,89%

Tabela 2 Total urocultures performed per gender

Gender	Quantity	Percentage
Female	55	83,33
Male	11	16,67
Total	66	100

According to FILHO et al. (2013) women are more susceptible due to several factors, such as anatomical proximity between the anus and vagina, which facilitates upward contamination, anatomical and functional changes of the bladder and active sexual activity.

Table 3 shows the frequency of microorganisms isolated in this study, where *Escherichia coli* was the microorganism with the highest frequency, followed by *Staphylococcus aureus* and *Klebsiella pneumoniae*.

Filho et al. (2013) conducting a study on the antimicrobial resistance profile of urinary tract infections in women assisted in a tertiary hospital, isolated from the 585 positive samples *E. coli* (69.9%), *Klebsiella pneumoniae* (6%), *Staphylococcus saprophyticus* (5.1%) and *Proteus mirabilis* (3.1%), a result similar to that in this research

Regarding the resistance profile in this study, the main focus was on *Escherichia coli*, *Staphylococcus aureus* and *Klebsiella pneumoniae* being the main bacteria isolated in the positive urine cultures.

Table 4 demonstrates the resistance profile of the isolated *Escherichia coli* strains, noting a high level of resistance to Ampicillin, Amoxicillin/Clavulanic Acid, Sulfamethoxazole-Trimethoprim, Nalidixic Acid, Cafazolin, and Tetracycline, respectively.

Tabela 3 Frequency of isolated microorganisms

Isolated Bacteria	
<i>Escherichia coli</i>	66,70%
<i>Staphylococcus aureus</i>	6,10%
<i>Klebsiella pneumoniae</i>	6,10%
<i>Enterococcus sp.</i>	4,55%
<i>Staphylococcus sp.</i> (Coagulase negative)	4,55%
BGN - UNIDENTIFIED	3,00%
<i>Streptococcus agalactiae</i> (B group)	1,50%
<i>Staphylococcus saprophyticus</i>	1,50%
<i>Klebsiella sp.</i>	1,50%
Corineforme	1,50%
<i>Citrobacter freundii</i>	1,50%
<i>Klebsiella oxytoca</i> (sucrose +)	1,50%

Table 4: Resistance profile of strains isolated from Escherichia coli

Escherichia coli	
Ampicillin	61,36%
Amoxillin/Clavulinic Acid	40,90%
Sulfametaxazole- Trimethoprim	34,10%
Nalidixic Acid	31,81%
Cafazoline	31,81%
Tetraciclina	29,54%
Ciprofloxacina	27,27%
Norfoloxacin	20,45%
Lomefloxacina	11,36%
Gentamicin	11,36%
Cefepime	11,36%
Nitrofurantoin	9,10%
Ceftriaxone	9,10%
Ofloxacina	6,81%
Amikacin	4,54%
Tobramycin	4,54%
Chloramphenicol	2,27%
Cefuroxime	2,27%
Levofloxacina	2,27%

Table 5 demonstrates the resistance profile of the isolated strains of Staphylococcus aureus, observing a high level of resistance for Amoxaxillin/Clavulanic Acid, Ampicillin, Nalidixic Acid, Amikacin and Cefepime respectively.

Table 5: Resistance profile of strains isolated from Staphylococcus aureus

Staphylococcus aureus	
Nalidixic Acid	75%
Amikacin	75%
Amoxicillin/Clavulanic Acid	100%
Ampicillin	100%
Cefepime	75%
Ceftriaxone	50%
Gentamicin	50%
Meropenem	25%
Nitrofurantoin	25%
Tetracycline	50%

Table 6 demonstrates the resistance profile of the isolated strains of Klebsiella pneumoniae, noting a high level of resistance for Ampicillin, and Sulfametaxazole Trimethropin respectively.

Table 6: Resistance profile of isolated strains of *Klebsiella pneumoniae*

<i>Klebsiella pneumoniae</i>	
Nalidixic Acid	50%
Amoxicillin/Clavulanic Acid	50%
Ampicillin	100%
Cefazolin	25%
Ciproflxacin	50%
Levofloxacin	25%
Lomofloxacin	50%
Nitrofurantoin	25%
Norfloxacin	50%
Tetracycline	50%
Sulfamethoxazole Trimethropin	75%

5 CONCLUSION

According to the results obtained, the importance of new studies about the arguments presented by the main microorganisms present in positive urine culture exams can be noticed, besides expanding the knowledge about the behavior against the antimicrobials tested.

For all the aspects presented, that the study developed may help new researches and, mainly, avoid self-medication that weakens the organism, besides creating bacterial resistance to the drugs available in the market.

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CHAPTER 23

Complex causality and metacomplexity, elements for building university omniknowledge

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ABSTRACT

It was possible to identify that university knowledge is not supported by the epistemic, meta-complex and meta-reflexive subject, university teaching is not really related to the requirements of the environment, problems arise when the student concludes their academic training, there are needs, emergencies and uncertainties and they have to face reality. The general objective of the research was to build the concept of 'university omniknowledge' by linking the elements of complex causality and metacomplexity. The methodology used analytical argumentation, including emergencies, developing complexities, the relevancies considered were: theoretical, methodological, social

and transdisciplinary, the method was deductive, explanatory and transdisciplinary, questions, objectives and hypotheses were raised, the research was based on the pragmatism, covered the epistemological and ontological field, exploratory and descriptive studies were carried out, the research design was exploratory transectional and techniques and instruments were used. The research was an original work, obtaining significant information that benefits the individual-society-environment, starting from the educational base, with which it was possible to build university omniknowledge, which is not limiting, specifies useful knowledge, is capable of integrate and allows access to all kinds of knowledge, is practical and is accompanied by experience.

Keywords: Complex causality, Metacomplexity, University omniknowledge, Construction.

1 INTRODUCTION

It has been identified on the basis of logic and rationality that university knowledge does not rely entirely on the epistemic, metacomplex and meta-reflexive subject.

The university student should reflect from, in and on the practice, besides that such subject in recurrent form should be able to exercise reasoning, additionally he possesses the innate competence to learn at all times and therefore has the possibility to develop formal and non-formal learning.

But it is also identified that university education is not really linked to the requirements of the environment, which causes problems for students when they finish their academic training, since they do not have all the tools to face reality.

For the university student, the lack of an integral knowledge and an effective exchange of experiences causes that at the conclusion of their academic preparation there are doubts about the amount of knowledge they have acquired and how much of this will be effectively applied, all this is a consequence that there is no complete contextual knowledge to seek and propose solutions to problems of the environment.

Today, the university student has to challenge a complex reality, where mainly needs, emergencies and uncertainties are presented.

In this framework, the present research has direct incidence in the educational and social areas, in this understanding, complexity and transdisciplinarity should not be left aside as two ways of thinking that

nowadays are added to the search for an integrating perspective of knowledge and reality, opposing the atomizing and fragmenting situations.

Now, causality, due to its direct relationship with research, is said to be complex, because every phenomenon or fact has a cause, nothing happens without a cause, everything that comes to be is for some reason, every beginning has a cause, these situations are multidimensional, so causality is in the field of complexity, based on these characteristics causality is the primary link with metacomplexity as will be seen below, in addition to providing elements to build the university omniknowledge; on the other hand, what is produced becomes the effect.

This complex causality uses as its foundation the Theory of Knowledge, composed of natural relations, where similarities, contiguity and therefore complex ideas are produced that include philosophical relations, modes and substances, initially seen from the classical approach.

Complex causality is also structural as a consequence that allows the generation of ideas, concepts and therefore the emergence of new knowledge. Thus, causality transcends the connection between phenomena, events, structures, explanations, transfers, dependencies, discoveries, thoughts and/or constructions, causing dialogues to manifest themselves.

For its part, the idea of metacomplexity is based on the following:

Metacomplex is that which cannot be summarized in a master word, in a synthesis, that which cannot be reduced to a law, that which cannot be reduced to a simple or mechanistic idea (Morín, 2005: 9).

The metacomplex is the way of seeing the world, where the observer becomes aware of the complex reality.

Metacomplexity is the characteristic of a pedagogical action that forces us to rethink the ways of teaching and learning from metacognition, that is, from the coexistence of the opposite, the incorporation of chance, uncertainty and awareness of what is known or learned.

It is a fact that human beings are complex, "hyper-complex" and even more metacomplex, where uncertainty, anguish and disorder appear as part of their being and existence (Morín, 2005:3).

Meta-complexity can put in crisis the capacity of orientation and response to the different problems that emerge from this relative situation; originating in individuals and social groups, in general, a "spatio-temporal" crisis and in particular, a break in the pedagogical act, by questioning the identity and role of those who "teach" and those who "learn" (Rosas, 2004:22).

Thus, the metacomplex goes beyond metacognition, breaking space, dimension and time as limiting elements in the conformation of ideas for the construction of knowledge.

On the other hand, omniknowledge is the concept that is developed in this research, it is the proposal, the place where it is integrated and identified that the human being (individual) can access all kinds of knowledge with their respective relationships, applying useful knowledge, using complex causality and metacomplexity.

The omniknowledge, is all the knowledge that the university student requires to face the

environment and reality.

2 MATERIALS AND METHODS

For the development of the research, the methodology used took into consideration the analytical argumentation related to the object of study and to provide an alternative solution to the problem, additionally we proceeded to make the informed argumentation, which incorporates the problem and the hypothesis, the design of the research strategy was used to give coherence to the formalization of the intentions and in turn, the feasibility was verified in the development of the research, which is supported.

The research included emergencies, as part of the procedures of the materials and methods of the research; then emergencies are the response to complex causalities, therefore, they can be considered as the effect, since they are unexpected situations that have emerged from something, it is the new thing that is presented by the interaction of the different systems, phenomena or facts that make reality.

In fact, an emergence is a quality that is produced by the sum of the parts, but it cannot be confused with the totality, coexisting the emerging whole, the emergence is a particular characteristic of the whole. Thus, the whole is often more than the sum of its parts and at each level of complexity new and extraordinary qualities emerge that do not have a direct correspondence to the attributed characteristics of the constituents.

Emergencies have the potential to change society and the environment, this is achieved when the individual is able to develop the dimensions of being, thinking and acting..

The emergency according to Morín, 2006:

"Emergency is a product of organization which, although inseparable from the system as a whole, appears not only at the global level, but eventually at the level of the components. Thus, the qualities inherent in the parts within a given system are absent or virtual when these parts are in an isolated state; they cannot be acquired and developed except by and in the whole". (p. 131)

An emergency is one that comes on suddenly and is equally:

- a) Unexpectedness of the emergency effect and
- b) the link of what emerges with its source, from within itself. (Sotolongo, 2009, p. 57).

For the specific case of the present research, social emergencies were taken into account, which are constituted by the society-education-environment system; where society continually presents complex situations at different levels of reality, has multiple connections, is active, is not in equilibrium, and this is the scenario in which the student must develop.

Education includes the teaching-learning process with its own particularities, seeks to integrate knowledge or knowledge, takes into account the adequacy of pedagogical theories, the new role played by technology within the educational process, also includes the performance and development of the university student and the alignment to his life project.

Referring to the environment, it is that which surrounds the university student, it is composed of the family, society, the environment, currently this environment has been amplified, because it is globalized, the environment supposedly is the one that dictates or raises the needs in which future professionals can develop and apply their knowledge, it is also composed of multidimensionality and self-organization among other aspects to be mentioned.

In this way, the integration of society-education-environment, makes situations emerge or appear with which the individual has to face, in this context new uncertainties are generated.

Therefore, complementarily emergencies have been confronted, considering the rationality to act, think and evaluate in a consistent way, it has been defined what was logically sought within the criteria of truth and knowledge of reality, determining the usefulness of university knowledge, so that these can be managed and used optimally, so as to be able to challenge the future through creativity, research, innovation and learning from mistakes, also religions to unite and disunite knowledge, concepts, ideas and thoughts, remembering what Morin, 2007 said, "the cause acts on the effect and the effect on the cause" (p. 99), this is how feedback is produced, then with these actions or responses to emergencies the consistency to the concept of university omnisknowledge was granted.

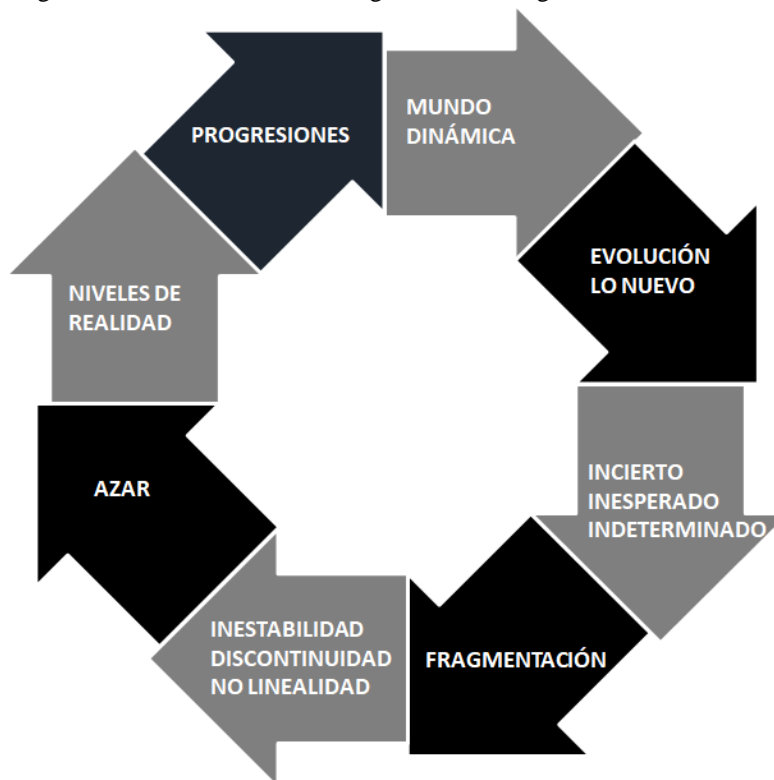
Based on Heisenberg's uncertainty principle (National Geographic, 2012), it is said that although there are some mechanisms to verify what is learned by the university student, there are also restrictions to determine in a real way the teaching-learning relationship, since there are external factors that affect the described relationship, externalizing the "disturbance" and in turn the emergence of uncertainty, where the areas of indeterminacy and unpredictability are found in the real.

The individual is surrounded by uncertainty due to the presence of the dynamics of the environment, where reality is not predictable, so that conjectures can occur, in uncertainty the existing and the non-existent are managed, for that reason, it is necessary to move on the possibilities that actions have in time.

The uncertainty principle affects the students' thinking, it has a direct influence on the philosophical question of "causality", it retains implications for science, which are not those commonly assumed, it makes all certainty about nature null and void and shows that science does not know and will never know where it is going and that scientific knowledge is at the mercy of the unpredictable wills of the universe, where it does not necessarily follow the "cause". (p. 11)

The emergence of uncertainty makes the complex, because it has elements of order and disorder, therefore, it is related to eventualities, it is the complex thinking that incorporates uncertainty and admits that which is contextualized, globalized, assuming the singular and the concrete, uncertainty is the way to face certainties, it makes the different areas perceive in a main way the uncertainties that have emerged in education, the need to have principles to face problems, the unexpected and the uncertain is born. (López et al, 2004).

Figure 1. Uncertainties in building omniknowledge. Own elaboration, 2021



PROGRESIONES: PROGRESSIONS

MUNDO DINAMICA: DYNAMIC WORLD

EVOLUCION LO NUEVO: EVOLUTION THE NEW

INCIERTO, INESPERADO, INDETERMINADO: UNCERTAIN, UNEXPECTED, UNDETERMINED

FRAGMENTACIÓN: FRAGMENTATION

INESTABILIDAD, DISCONTINUIDAD, NO LINEALIDAD: INSTABILITY, DISCONTINUITY, NONLINEARITY

AZAR: CHANCE

NIVELES DE REALIDAD: LEVELS OF REALITY

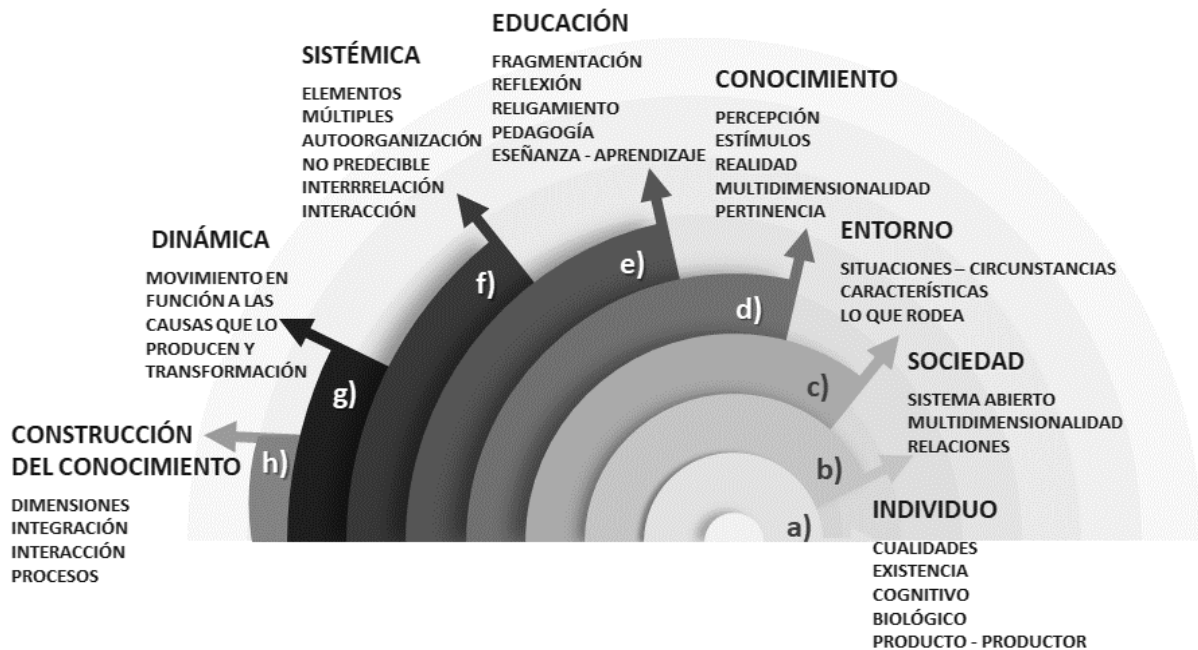
The complexities developed in the research are divided into a set of arguments that facilitate the understanding of the work (Da Conceição, 2008). This as part of the methodology employed.

For Da Conceição De Almeida, 2008, in relation to complexity, he expresses the following:

A constellation of diverse properties and understandings surround the notion of complexity. What is it? A method? A theory? Both? A property belonging to some systems? An attribute of all phenomena? These questions could multiply, since, with the increasing use of the word complexity in science, the meanings imputed to it are also multiplying. This side of the construction of knowledge is positive because it avoids the crystallization of a single meaning, but it also hinders a more accurate understanding of the notion of complexity and trivializes it "to avoid explaining", says Morin, "it is increasingly affirmed 'this is complex'. It is necessary to proceed to a real revolt and to show that complexity constitutes a challenge that the mind can and must overcome, appealing to some principles that allow the exercise of complex thought". (p. 23)

For the research, causalities have been identified that should be understood as the complexities developed.

Figure 2. Complexities developed. Own elaboration, 2021.



h) CONSTRUCCIÓN DEL CONOCIMIENTO: CONSTRUCTION OF KNOWLEDGE

DIMENSIONES: DIMENSIONS
INTEGRACIÓN: INTEGRATION
INTERACCIÓN: INTERACTION
PROCESOS: PROCESSES

g) DINÁMICA: DYNAMICS

MOVIMIENTO EN FUNCIÓN A LAS CAUSAS QUE LO PRODUCEN Y TRANSFORMACIÓN: MOVEMENT ACCORDING TO THE CAUSES THAT PRODUCE IT AND ITS TRANSFORMATION.

f) SISTÉMICA: SYSTEMICS

ELEMENTOS: ELEMENTS
MÚLTIPLES: MULTIPLES
AUTOORGANIZACIÓN: SELF-ORGANIZATION
NO PREDECIBLE: NOT PREDICTABLE
INTERRELACIÓN: INTERRELATION
INTERACCIÓN: INTERACTION

e) EDUCACIÓN: EDUCATION

FRAGMENTACIÓN: FRAGMENTATION
REFLEXIÓN: REFLECTION
RELIGAMIENTO: RELIGION
PEDAGOGÍA: PEDAGOGY
ESEÑANZA – APRENDIZAJE: TEACHING - LEARNING

d) CONOCIMIENTO: KNOWLEDGE

PERCEPCIÓN: PERCEPTION
ESTÍMULOS: STIMULOS
REALIDAD: REALITY
MULTIDIMENSIONALIDAD: MULTIDIMENSIONALITY
PERTINENCIA: PERTINENCE

c) ENTORNO: ENVIRONMENT

SITUACIONES – CIRCUNSTANCIAS: SITUATIONS - CIRCUMSTANCES
CARÁCTERISTICAS: CHARACTERISTICS
LO QUE RODEA: WHAT SURROUNDS

b) SOCIEDAD: SOCIETY

SISTEMA ABIERTO: SISTEMA ABIERTO
MULTIDIMENSIONALIDAD: MULTIDIMENSIONALITY
RELACIONES: RELATIONS

a) INDIVIDUO: RELACIONES

CUALIDADES: QUALITIES
EXISTENCIA: EXISTENCE
COGNITIVO: COGNITIVE
BIOLÓGICO: BIOLOGICAL
PRODUCTO – PRODUCTOR: PRODUCT - PRODUCER

Now, to understand the research problem, initially the situation was described (contextualization), then it is said that currently in several universities still applies university teaching (all - whole), referred to a single subject, so the student acquires a unique or universal knowledge of the specific subject being taught, other knowledge or knowledge from other people, cultures, areas, etc. are left aside; so this process is still identified by the direct interaction between the teacher and the university student.

University teaching is not really connected with the environment and this is due to its dynamics, which restricts the assignment of specific capabilities to students, since new scenarios are continuously occurring, there are limitations regarding the development of thinking and the opportunity to generate knowledge, there is no effective exchange of experiences between subjects to seek and propose solutions to problems of reality and therefore knowledge is not consolidated.

The opportunity to acquire multidisciplinary knowledge that comes from the environment is not being taken advantage of, so university knowledge is not strengthened either.

Then, it is considered that the knowledge does not become integral, making the university student at the end of his academic preparation does not know about the scope of the knowledge acquired in his training process, to this is added that the student does not question the knowledge obtained by him, so he does not have a contextual knowledge.

The teaching-learning process is still linear, it does not take into account that teachers or other people transmit other knowledge, knowledge or experiences on a common topic, restricting the student so that he/she can expand his/her knowledge frontier and use it in the best way.

It is not identified that there is social responsibility on the part of the environment, so that university students know what knowledge they should acquire to be applied in that context.

A global cognitive justice is not observed academically so that the university student can think, act and reflect on society in an integral and holistic way, so that he/she reaches a multiple but useful knowledge, a real distinction between subject and object does not prevail either, the union with nature or the environment is not identified in a way that stimulates the translation of knowledge, knowledges and practices, in addition that go towards the restitution of common sense knowledge.

Although the university student goes through a training stage, where the teaching-learning processes take place, accessing data, information and knowledge, he is not entirely ready to face a new reality at the end of his academic training.

In this context, it is necessary to determine for the individual-university student what is the knowledge with which he must face the new reality, or what is the knowledge that he has really acquired that will allow him to perform his professional activities, on the other hand, he must be able to respond with his knowledge to complex causalities, being able to adapt by making use of his academic preparation, using the tools acquired, using the information he has and integrating his knowledge to solve problems in the complex reality.

The individual faces an uncertain environment, where demands vary, thus, knowledge must facilitate access to means and resources, in addition to proposing and generating changes, satisfying the needs of society and therefore the environment.

The education received by the student should facilitate and allow him/her access to opportunities, in addition to being able to acquire experience and be prepared to undertake undertakings.

In addition, other limitations are identified since interdisciplinary knowledge that contribute to the development of multiple skills is not provided, reasoning in many cases is not critical, which means that the interpretation and reflections on each situation are not adequate, the individual is conditioned to visualize difficulties and project solution alternatives from the knowledge acquired in specific disciplinary areas.

The individual should be able to use the knowledge to have mastery of his profession; developing in the activities in a suitable, skillful and professional way, additionally, thanks to the application of such knowledge, he should use strategies that lead him to develop conveniently in the environment and society.

The university student has not assumed a total commitment to become the protagonist of his own learning, he has not realized that it is not enough to accumulate knowledge in disciplinary areas, but should complement his training with the acquisition of other knowledge and identifying his abilities and skills.

In addition, the strengthening of knowledge is affected because it presents a delegation of activities without a defined purpose, the aspects of self-training and self-regulation are still not understood, there is a lack of understanding and comprehension to develop cognitive and interpersonal skills, to this is added that there is no real development of the mentality of self-determination and adaptability, to cope with the environment and society.

Based on the above, the questions that guided the research are the following: how is the concept of university omnisknowledge constructed through the use of complex causality and metacomplexity, what is the relationship between complex causality and metacomplexity, what is understood by knowledge, and what factors incorporate complexity and transdisciplinarity in relation to knowledge?

Regarding the theoretical relevance of the research, it is based on the use of the complex and transdisciplinary approach, since it allows having a wide scope in the research, since it can be verified, rejected and theoretical contributions can be made in relation to the construction of the concept of university omnisknowledge, a concept that has not been previously developed by any person or researcher.

Theoretically, the present work also takes relevance because it conceives the reflection about the epistemological, ontological and methodological dimensions to access the information that is produced, so theories, information and results have been compared, likewise it was sought through the use of theory, the connection with the level and depth of what was raised, showing the articulation and organization of the information, giving way to the generation of new knowledge and the development of a new concept.

In relation to the methodological relevance, the use of research methods, techniques and procedures was used, so that the knowledge used was valid and reliable, these were applied directly in the construction

of the concept of university omnisknowledge, these aspects allowed standardizing its use for further research.

In turn, the methodological relevance of the work was given by the presence of contributions of a theoretical nature, various instruments were also used, consequently techniques had to be assumed to be applied to the research topic.

While the research acquires social relevance because it has a direct impact on society and therefore on the individual, as it is directly connected with education that includes knowledge, aspects that serve to develop in a complex environment, at the same time contributing to meet the demands of society by solving problems.

The transdisciplinary relevance was in accordance with the guidelines mentioned by Espinosa (2014):

- Transdisciplinarity will help integration and religation.
- It will be accepted that it is impossible to bring together in a single discipline all the knowledge produced and yet to be produced.

From the above it follows that transdisciplinarity has its starting point in disciplinarity; that is, it accepts the advantages of disciplinary knowledge insofar as it allows the production of a large amount of knowledge, deepening the understanding of reality, and therefore it promotes, but it invests it with a new meaning that allows the producer not to get lost in the fragment, but to contextualize it in the totality.. (p. 35)

The research methods used are as follows:

In contrast to the deductive method, the inductive method was used because it started from particular aspects to reach the general, working with four groups composed of individuals related to the research topic, who provided answers that later became generalized. We started from individual data and synthesized them by similarities, subsequently obtaining general propositions that allowed us to explain and understand the particular cases, thus favoring the interpretation of the results. To this is added the analysis of the documentation of specific aspects in order to make generalizations.

This method was adapted to the research, since it focused on obtaining answers about what a certain part of the reality under study is like, a situation that was achieved through the surveys conducted with the four groups in the sample.

The explanatory method was also used, which helped to find the causes within the object of study, thus facilitating the understanding of the fact and the conditions under which it occurs. It focused on the identification of the origins or causes of the set of facts present in the research, where the objective was to know why they occur, for which we proceeded to delimit the existing causal relationships.

The complex aspect linked the diversity of knowledge and knowledges obtained, epistemology, theory and methodology were included, a dialogue was carried out among the answers and the emergencies raised were considered.

The transdisciplinary helped to integrate the information, achieving the unity of knowledge, it also allowed to relate to scientific knowledge, it visualized the aspects of reality, it was possible to know the nature of the problems, although the research was in the field of uncertainty, finally, it was possible to transform the previous knowledge although it was within the framework of the dynamic structures that make reality.

For the development of the research, the following objectives were set: to construct the concept of university omniknowledge through the linking of complex causality and metacomplexity, to identify the relationship that exists between complex causality and metacomplexity, to examine the notion of knowledge and to determine the factors that incorporate complexity and transdisciplinarity in relation to knowledge.

The hypothesis was the following: the construction of the concept of university omniknowledge with the use of complex causality and metacomplexity will allow determining the structure of university knowledge and its impact on society and the environment.

The development of the work was supported by pragmatism because it is an element that proposes knowledge as valid when it has a practical utility, which is aligned with the research, in turn, causality was presented because it establishes the meaning of things or facts according to the relationships that are presented, helping to determine what is practical or not, the links between the practical and useful were important, seeking to generate knowledge in this context for the defined purposes.

In addition, pragmatism made it possible to motivate the change of reality, from the point of view of social utility, where society is within the environment, it is not purely subjective and neither is it framed in closed systems, on the contrary, it goes towards action and the objective. Pragmatism in the context of research facilitated new forms and principles that should govern the knowledge of the individual.

When pragmatism is taken into account as a method, it is directly related to the object of study, where reality is multidimensional, knowledge is comprehensive and admits the interpretation of the individual's experience, being conditioned to the interpretation of the cause-effect factor, for which there must be empathy with the individual-society in order to reach an understanding of the truth, where previously there has been an encounter between the statement and the facts.

Pragmatism within the work performed, is associated with the practice developed in the research, providing a guide for action, which consists in the analysis of the truth at different levels of reality. Pragmatism does not accept those practices that are forced and imposed, as long as they are not those developed by the individuals themselves as a consequence of the experience of their daily lives.

Pragmatism is amplified in the complex and transdisciplinary field, as a result of the fact that, besides reflecting reality, it goes beyond, since it identifies the usefulness or advantage of the knowledge that the university student should have.

In relation to the research about the epistemological field, Domínguez, E. (2006) refers to Michel Foucault and indicates that he has called "episteme" and also "epistemological field" to the underlying structure and, thus, unconscious, that delimits the field of knowledge, the ways in which objects are perceived, grouped, defined. Thus the episteme is not a human creation; it is rather the "place" in which man is installed and from which he knows and acts according to the resulting structural rules of the episteme. (p. 74)

This epistemological field is given by the nature of knowledge, which is in direct relation to the work that was investigated, where truths, beliefs and justifications are integrated, framed in reality, besides that it is also a real attempt to analyze the knowledge possessed by the university student.

The research developed was connected with the explanatory epistemology that deals with the "third why", allowing to scientifically base the starting point of the research, making the detection of the relationship between the object and the attribute, then we speak of complex causality and metacomplexity with its intervening and related elements thus constituting its own attributes.

Similarly, externalist epistemology was used as a support, where different points of interest were treated: complex causality, metacomplexity and knowledge; considering that experience and the relationship with reality are the starting point of all knowledge, for our case it was developed the omnisknowledge, assuming and establishing it as a valid knowledge.

Then, epistemology is aligned with the research, because there is an edification and representation of the environment, in turn, scientific and humanistic knowledge are present, an exploration of knowledge was conducted, having made a review of various aspects and issues in a specific way to reach the general.

In the research there was the purpose of determining what was the real knowledge that the university student should have to face a new reality at the end of his studies, where useful knowledge is present or inserted in each individual. There was the attempt to clarify and deepen the term "to know" as it is incorporated in each person; so that the individual can interact with reality.

For the present study, epistemology has satisfied the following conditions:

- a) Concerns the science itself..
- b) It deals with philosophical problems, the causes and effects of natural things and especially of the individual..
- c) Proposes solutions to a particular problem, solutions that fit the reality of the research..
- d) Provides supported research.
- e) Suggests promising new approaches.

The epistemological problems covered by the research were based on the indications of Mario Bunge:

- a) Gnoseological problems:
 - Based on the observation of the facts and what they represent.
 - Empirical and theoretical concepts.
 - Use of the concept of probability according to the available information..
- b) Methodological problems.
 - Control of the social phenomenon
 - Theoretical confirmation of the hypothesis.
- c) Ontological problems.
 - It is not possible to respond from a traditional point of view.
 - It includes to be.
 - Abstract and concrete reality.
- d) Axiological problems
 - The validation.

- Cognitive value and practical value.
- Decision theory.

The treatment of the object of the research was given by the:

- a) Empirical knowledge: For there is a knowledge of the facts and an apparent order, explanations were given, based on experiences and knowledge obtained from others..
- b) Scientific knowledge: It is present, since an analysis of the fact was provided, the causes were identified, a methodology was followed, the reasons were explained, it was general, methodical and systematic..
- c) Philosophical knowledge: It came about through immediate realities, which, being of a suprasensible order, transcend experience. Reflection was accessed in order to obtain knowledge, and in turn, explanations were accepted..

With epistemology, the previous knowledge accepted as valid was questioned, it is assumed that, in the reflections carried out, epistemology did not influence the object of study of the research, that is, that the techniques and procedures of the method to obtain knowledge, organize it and the criteria to validate it were not affected..

The ontological sense for the present research was used in relation to the conceptual deformations of the concept of "construction of a new object" or "construction of the scientific object". It is not a question of ignoring the ontological or "material" existence of a reality beyond discourse. It is not an ontological but an epistemological construction. That is to say, it is not about "fabricating" in a material way a new object but about the construction of new knowledge, of new categories of analysis that make us discover, unveil aspects that until some moment were invisible. They make us discover aspects of reality hidden behind appearances. In other words, the new knowledge emanating from a research makes us visualize "a new object" ignored until that moment, not in the ontological sense of what there is, what exists, what is, but "new" in the epistemological sense of "new" in the epistemological sense. (Sirvent y Rigal, 2012, p.173).

It must be taken into account that the presence of the reality of existing and concrete facts in the individual also originates from a reality of possible, non-existent and abstract facts..

From the ontological point of view, the research covered the following areas:

- The unique and multiple reality.
- The relationship between thought and reality.
- Descriptivism to eliminate what does not exist from the view of reality as homogeneous.

The ontology in this research was given by the identity of the individual-university student, who not only reasons to reach conclusions, but on the contrary is produced by the relationship he has with his operations. The university student possesses intangible resources that are knowledge, which allows him to have a tool that can be used as a strategy to face reality in its multiple dimensions.

It is identified that the connection of contextual knowledge is a primordial component, and at the same time one of the greatest challenges in its use, due to the complexity of reality it is no longer enough

to use traditional methods, techniques and tools, to be practical and efficient it is necessary to know what is really useful.

Ontology in this research should be understood as the knowledge representation system. Ontology sought the understanding of omnisknowledge, which contains the knowledge of the individual and is necessary to make inferences, but based on complex causality and metacomplexity.

In the methodological field, transdisciplinarity had its own characteristic, according to the object of knowledge to be constructed (the omnisknowledge), the environment, the sociocultural scenarios and the availability of resources.

Therefore, in this field of transdisciplinarity we do not refer to a method as such, but to a strategy, where the elements become interrelated. Thus, the discovery of real and useful knowledge was sought, with the intervention of everything that surrounds the university student.

At this point it is important to mention that beyond the fact that all knowledge contains power, the idea would be to complexify and try to dialogue the principles of uniqueness, specialization and integration (Teves, 2009).

On the other hand, complexity in the same way implies referring to the interrelationships that can occur if the methodology is considered from a systemic approach, since the parts integrate the whole that allows relationships that are not simple, but rather are exchanges and complementarities.

Therefore, the methodology used in this research has different types of methods that complement each other adequately.

Thus, methodologically, transdisciplinarity translates into the use of the necessary tools to cover the approach to the object/process of study, which means incorporating tools from different disciplines. It also implies creating the necessary tools for the research in progress and that the researcher should think precisely according to his/her needs.. (p. 17)

According to the methodology used for the research, exploratory studies were carried out because the objective was to examine the topic or research problem, which has been little studied, and there were many doubts or it had not been addressed before. The literature review revealed that there were only unresearched guidelines and ideas vaguely related to the topic of study, and other connections and areas were investigated from different perspectives. Exploratory studies served to familiarize ourselves with the relatively unknown facts, gaining information about the possibility of carrying out a more complete investigation of the particular context, examining new problems, identifying promising concepts or variables, establishing priorities for future research, suggesting assertions and postulates. Exploratory studies rarely constitute an end in themselves; they generally determine trends, identify areas, environments, contexts and situations of study, potential relationships between variables; or set the "tone" for further, more elaborate and rigorous research. These inquiries are characterized by being more flexible in their method compared to descriptive, correlational or explanatory ones, and are broader and more dispersed (Hernández, R. Fernández, C. and Baptista, P., 2014, p. 91).

At the same time, facts, situations, contexts and events were described; this was to detail how they are and how they manifest themselves. Thus, it was resorted to using the type of research on descriptive studies, it was sought to specify the properties, characteristics and profiles of people, groups, processes, which are subject to the analysis of the research. Only information was collected independently and jointly on aspects related to the research. Just as exploratory studies serve fundamentally to discover and prefigure, descriptive studies are useful to show with precision the angles or dimensions of an event, context or situation. It is possible to define, or at least visualize, what will be measured and about what or whom data will be collected (people, groups) (Hernández, R. et al, P., 2014, p. 91).

The research design that suited the work was the exploratory transectional, the purpose of this design was to begin to know a new situation, where the results are valid exclusively for a time and place. It was an initial exploration at a specific time. This design was adapted to the research because it is used within the qualitative approach, so it is called "field immersion".

According to Cuauro, 2014 in reference to the techniques says:

a) Techniques

The technique is a set of practical knowledge or procedures to obtain the desired result, then, the technique is applied in any field of science: art, education, communication, among others. Therefore, the technique for the collection of information constitutes the practical means that was applied in obtaining information in this research.

The word technique in its etymological sense has two meanings: as an art and as a form of action. In both meanings it is related to forms or procedures of practical action. In the methodological field, when we speak of research techniques, we refer to the "how to do" that is proper to science. It should be specified then that in the methodological process, the primary function of research techniques is to carry out the observation of empirical phenomena and to obtain information to later contrast it with the theoretical model adopted or to generate a substantive theory based on them (Yuni, Ciucci, 2005, p. 169).

The instrument for the collection of information was the set of tangible means that made it possible to record, preserve and capture all that was investigated through the techniques used that facilitated the collection of information.

Therefore, observation was used as a technique to visualize the phenomenon and the context that was studied. It was a practical procedure that made it possible to discover, evaluate and contrast realities in the field of study. Direct observation was used in the collection of information, specifically in relation to the research, obtaining first-hand information.

The survey technique was used for the collection of information, since it avoids the biases of the persons surveyed. The survey was based on a questionnaire or set of questions that were prepared with the

purpose of obtaining information from the people, which included four groups: teachers, students, businessmen and professionals.

For the search of articles, the following databases were used: Scientific Electronic Library Online (SciELO), Red de Revistas Científicas de América Latina y el Caribe, España y Portugal (Redalyc), Dialnet, Google Scholar (Google Académico) and Red Iberoamericana de Innovación y Conocimiento Científico (REDIB).

Likewise, books and different web pages were reviewed, so that the information gathered would support the research work.

The search for information covered more than 5 years, because there is limited information on the research topic, so the search period had to be extended.

The surveys were elaborated with Microsoft Forms and were carried out digitally; for the analysis of the surveys we resorted to the use of Excel spreadsheets.

3 RESULTS

The research conducted had very little background because it is a new topic, there were only some aspects that were connected with the research, therefore, a theoretical compilation was carried out due to the lack of information, complemented with questionnaires, observation and experience.

An analysis was made of how the phenomenon of knowledge is currently presented in students, and to determine what is useful for them, so that individuals can face a new reality once they graduate, performing for this the interpretation of information and data with their attributes or particularities, in addition to verifying their interrelationships. Thus, we proceeded to carry out the exploration of information in four specific groups previously described and the review of printed documentation.

We resorted to non-probabilistic sampling, since we do not have access to a complete list of the individuals that make up the population (sampling frame) and, therefore, we do not know the probability that each individual will be selected for the sample.

For this research, we proceeded to carry out a convenience sample, which consisted of determining four groups:

- Teachers.
- Students.
- Graduates.
- Entrepreneurs.

Convenience sampling was based on selecting a sample of the population because it was accessible. That is to say, the individuals used in the investigation were chosen with a statistical criterion. This

convenience translates into great operational ease and low sampling costs, in addition to the fact that it does not detract from the validity of the sample.

Based on the analysis of the surveys conducted, the findings are as follows:

Findings from the information obtained from teachers.

- a) According to the information obtained from teachers, most of them indicate that only a part of the subjects taught at the university are useful for students in the labor field, so we infer that only some knowledge is really useful for the new professionals.
- b) In turn, teachers mention that in order for the new professional to perform in the labor field, he/she must possess competencies, socio-affective behaviors, cognitive, psychological, sensory and motor skills that allow him/her to develop adequately in a task, practice or function, together with the ability to perform a specific activity or job efficiently and effectively.
- c) Teachers understand acquired knowledge as the assimilation of the theory.
- d) Teachers say that the reasons why students do not acquire knowledge are mainly due to lack of interest and, to a lesser degree, lack of commitment, non-application of ICTs, lack of practice, lack of a previous knowledge base, and also because they think that the knowledge transferred to students will not be useful later in their academic life.
- e) Identify as the main strategy for acquiring real knowledge, the realization of internships.
- f) They mention that the causes or causalities to obtain knowledge are given firstly by interest, then by motivation and practice.
- g) 80% of teachers indicate that there is no connection between the curricula (what is taught) and the needs of the environment, and the other 20% say that the connection is only partial.
- h) For teachers, the best way to evaluate the student's knowledge is through the verification of the execution of practical exercises, without leaving aside the way of observing how they solve problems and verifying the solutions presented.
- i) Teachers believe that the market requires a new professional who is capable of solving problems, can work in a team and has values.
- j) For teachers, the way students apply their knowledge is through contact with the environment and practice, in addition to the application of problem solving.

Findings from information obtained from students

- a) University students assume that knowledge is understood as everything that is learned and that will allow them to develop professionally.
- b) The acquisition of knowledge for students occurs through the assimilation that takes place in the teaching-learning process, receiving information, in addition to practice, among other aspects.
- c) They consider that useful knowledge is the specific knowledge taught in a professional career, as well as knowledge acquired through practice; others indicate that all knowledge is useful and is also the assimilated theory.
- d) The students believe that the application of knowledge in the labor field occurs when theory is put into practice and, to a lesser extent, when solving problems in the environment.
- e) The causes or causalities to obtain knowledge, according to the students, are essentially given by the need, in addition to the commitment with the environment and interest that each person gives to access knowledge.
- f) According to the students, the barriers for acquiring knowledge are focused on the lack of interest, due to the fact that teaching is not related to real cases and, on the other hand, there is laziness on the part of the students themselves.
- g) Students think that the labor market requires or demands a professional with efficiency, practical performance, who is continuously trained, who is also able to perform smoothly, master the theory and adapt to the environment.

- h) For most of the students there is no connection between the curriculum and the environment; another percentage assumes that this is only partially the case.
- i) In order to perform in the labor market, they believe that one must have a practical mastery and in-depth knowledge of the subjects learned at the university.
- j) Students consider that in order to relate or connect knowledge there must be interest on their part; they also say that it is important to take into account the teacher's way of teaching.

Findings from the information obtained from the titled persons

- a) Graduates indicate that the acquisition of knowledge during university life occurs through study, practice, transmission of knowledge and research.
- b) Knowledge that is useful refers to theoretical knowledge, which has to be put into practice, while scientific and academic knowledge is also relevant.
- c) For the graduates, the causes or reasons for obtaining knowledge are in line with the needs and to put into practice what they have learned.
- d) According to the graduates, only 10% indicate that they apply 100% of the knowledge acquired at the university, another 20% say that it is only applied between 50% and 70%, the rest allude to other percentages that are between 60%, 40%, 35% and 10%.
- e) Graduates identify that the labor market requires a new professional to have experience, broad knowledge of different areas and a predisposition to continue learning.
- f) 60% of the respondents say that there is no connection between the curricula (what is taught at the university) and the needs of the environment, while only 30% say that there is such a connection.
- g) 90% of the graduates identify that in order to perform in the labor market, theory must be put into practice.
- h) According to the qualifications, to evaluate an acquired knowledge, this can be done through the evaluation of the result obtained.

Findings from information obtained from entrepreneurs

- a) According to the employers, an acquired knowledge is evaluated according to its knowledge in ICT and the specialized or specific knowledge that the person has.
- b) Employers say that the problems encountered by new professionals in applying knowledge are mainly due to lack of practice and experience.
- c) The causes or causality for a person to acquire knowledge is produced by the person's desire for self-improvement.
- d) The best way to verify whether the new professional applies knowledge is through his or her practical performance and through the results obtained.
- e) Regarding the connection between the curricula (what is taught at the university) and the needs of the companies, 40% indicate that they are connected, another 40% say that they are only partially connected, and 20% indicate that they are not connected.
- f) For entrepreneurs, knowledge is evaluated through the execution of practical work and the resolution of real case problems.
- g) Among the various comments on what the labor market requires of a new professional, the application of knowledge stands out, but they indicate that the attitude of the person is also a determining factor.
- h) According to the employers, the means for the new professional to apply his or her knowledge is through practice.

4 DISCUSSION

Referring to Selltiz et al (1976), the research objectives that have been set are in the first group and are those that have been proposed to be achieved, obtaining knowledge of the phenomenon or discovering

new aspects about it, as a result of which the research problem has been formulated with greater precision, until the hypothesis has been formulated.

The research questions have been formulated, according to the methodology described above, the same that covered the problem, which, through the analysis of the data and information and its interpretation, have made these questions to be answered, in addition, helped to follow the direction of the chosen theme.

What was intended to be known through the research was obtained. The development of the specific objectives allowed to reach the general objective and therefore the expected results of the research.

The research objectives are precise because they identify what was desired to be achieved throughout the research; they are related to the research problem and the type of study.

The objectives provide clarity to the research, since they are easily understood.

Table 1. Hierarchy of objectives

LEVEL OF COMPLEXITY	OBJECTIVES
LOW	DESCRIBE / INDICATE Se concentran en indicar rasgos o circunstancias de algo.
INTERMEDIATE	DEFINE / EXEMPLIFY / NARRATE Exigen una labor más detenida de focalización en los rasgos o circunstancias de algo.
HIGH	ARGUE / EXPLAIN / COMPARE Proponen un conocimiento más profundo del por qué, el cómo y el para qué de algo.
VERY HIGH	ANALYZE / SYNTHESIZE / EVALUATE They propose a deeper knowledge since they propose the above and aim at linking something with other things (similar, different, opposite, parts of it, etc.).

Note: Information based on Universidad del Salvador (del Salvador University), 2021. Own elaboration, 2021

The objectives set out in the research are located in the high and very high level of complexity, due to the characteristics they present.

The hypothesis is written based on a real situation, the statement already made it to be considered true, a situation that was verified with the development of the research. It is a complex hypothesis, since it predicts the causal relationship between the variables, both the dependent and the independent.

That is to say that with the statement of the problem the working hypothesis was born, in turn, the methodology establishes the researcher's link between theoretical and empirical knowledge, which presumes an initial dialectical relationship between both types of knowledge, where the theory guides the empirical research and the latter transforms the theoretical foundations.

The relationship between the general objective and the hypothesis suggests that both are consistent; it is also observed that there is a direct and exact link between them. In this framework, the coherence between the title, the problem, the objectives and the hypothesis is also present methodologically.

During the development of the research, coincidences and discrepancies of the information obtained have been found.

Coincidences:

- a) It is considered that only some knowledge is useful to develop in the environment.
- b) Knowledge comes from the assimilation of theory and research.
- c) Knowledge is generated because there is interest and motivation in the individual.
- d) Useful knowledge is considered to be knowledge that makes people specialists in a given area.
- e) In general, there is no relationship between what is taught and what university students learn, therefore, it is not aligned with what is really required by the environment.
- f) The way to verify knowledge is through practical development, problem solving and with the results obtained.

Discrepancies:

- a) The student does not have the knowledge to develop the following competences.
- g) In addition to knowledge, the individual is expected to be a team player and to possess values.
- h) Knowledge is not acquired because there is no practice.
- b) Knowledge is not acquired because real cases are not taught at the university.
- c) They believe that knowledge is transferred depending on the way the teacher teaches.
- d) Only some people believe that all knowledge is useful.
- e) Knowledge is produced because needs arise in the environment.
- f) A minimum percentage of people think that 100% of the knowledge acquired at university is applied.
- g) It is thought that the new professional must have experience, including a broad knowledge of the different areas of knowledge.
- h) The method for verifying the knowledge possessed by the individual is not clearly identified.

According to the information gathered, the contrasts between coincidences and discrepancies were contrasted and an analysis was carried out in order to have a deeper understanding of the elements that are part of the construction of omniknowledge.

Table 2. Contrasts between coincidences and discrepancies

COINCIDENCES	DISCREPANCIES	ANALYSIS
Only some knowledge is required.	Not only knowledge is required.	Most people believe that only a few skills are necessary to get by in the environment.
Knowledge is gained through assimilation of theory and research.	Knowledge is produced because needs arise. Knowledge is not acquired because real cases are not taught and there is no practice.	Knowledge is given by assimilating theory and conducting research, but this is restricted when it is not related to reality.
Knowledge happens because there is interest and motivation.	Knowledge is not given because the individual does not develop competencies.	Interest and motivation to obtain knowledge is key, which must be complemented by the development of competencies.
Useful knowledge is what makes individuals specialists.	All knowledge is useful. The new professional must have experience, as well as a broad knowledge of different areas of knowledge.	Most people accept that only some knowledge is necessary, but the complexity of the environment requires access to all knowledge, because everything is useful.
There is no relationship between what is taught and what students learn.	Knowledge is not connected due to the way teachers teach. Only a minimum percentage of knowledge acquired at the university is applied in the environment.	Knowledge is still fragmented.

Knowledge can be verified through the practical development of the individual, through the resolution of problems, in addition to evaluating the results obtained.	No clear way to verify knowledge is identified.	Most people indicate that the way to evaluate knowledge is through practice, solving problems and visualizing the results.
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Note: Differences are shown according to the information obtained. Own elaboration, 2021

Las diferencias se muestran según la información obtenida. Elaboración propia, 2021:

- The theory regarding physics oriented to the construction of omniknowledge

For Galindez, 2007, when referring to quantum physics, he mentions that:

"For classical physics the description of the motion of macroscopic objects is obtained with a precision close to accuracy; quantum physics explains the microscopic world with a margin of uncertainty. This margin of error is what has led to great research in search of minimizing this uncertainty." (p. 19)

Framed in this context, the theory of quantum physics refers to harmony and overcoming fragmentation, which provides the basis for developing omniknowledge, where not only generalizations are given; in turn, quantum physics starts from the real as something influenced by the observer, and there is a parallelism with the present research.

According to Klimenko, 2011, the term quantum physics also invites us to reflect on the relativity of the nominal value of knowledge: on the one hand, it is important to cultivate knowledge in human beings in order to better understand the world in which they live, and to build their actions in a more evolved way; however, the accumulation of knowledge itself can lead people to alienate themselves from the world and from themselves. (p. 166)

- Cognitive science theory oriented to the construction of omniknowledge

Ojeda, 2001, when speaking of cognitive sciences, insinuates the following:

"Cognition" derives from the Latin word *cognosco*, which means "to know by the senses," "to see," "to know," "to recognize." But also, "to know by intelligence", "to understand" or "to be informed". For its part, the expression "cognitive sciences" corresponds exactly to the well-known word of Greek origin "epistemology", a term perhaps nowadays in disuse, possibly due to its long historical trajectory (more than 25 centuries), which prevents it from giving an understanding of the novel nuance that cognitive science attributes to itself, and which in Spanish means "theory of knowledge", i.e., the attempts to explain how we know. Varela defines cognitive science as "the modern scientific analysis of knowledge in all its dimensions". Of course, that we know seems to be of immediate evidence, and this knowing is something that human beings and many other living beings do, at least in the case of the cognitive sciences. (p. 1)

Cognitive sciences aim to understand what knowledge is and how we learn, they are a multidisciplinary space in which different disciplines concur, they also carry out the interdisciplinary study of the mind and intelligence, reflect on education creating links and structuring knowledge derived from psychology, neurosciences, social sciences and theories of intelligent artificial systems.

- The theory about knowledge oriented to the construction of omniknowledge

For Vargas-Mendoza, 2006, on knowledge, both point out that:

"In the phenomenon of knowledge, consciousness and object meet face to face: the subject and the object. Therefore, knowledge can be defined as a determination of the subject by the object. A knowledge is true if its content agrees with the object mentioned.
 Knowledge has three main elements: the subject, the image and the object. Seen from the side of the subject, the phenomenon of knowledge approaches the psychological sphere; from the side of the image with logic and from the side of the object with ontology.
 We cannot advance a single step in knowledge if we do not start from the assumption that everything that happens takes place regularly and is governed by the principle of causality. This principle is expressed by saying that every change, every process has a cause." (7, 8 y 22)

Knowledge is based on the perception of the senses, where stimuli are converted by the brain, generating a personal interpretation of reality, it is the action and effect of knowing, that is, obtaining information to understand reality through reason, understanding and intelligence. It is the result of the learning process, where reality is reflected and reproduced in human thought, in addition to experiences, reasoning and learning. Knowledge is a network of relationships, it is a conscious and intentional fact to learn the qualities of the object.

- The theory of transdisciplinarity oriented to the construction of omniknowledge

In relation to transdisciplinarity, Nicolescu, 1996, postulates that:

Transdisciplinarity comprises, as the prefix "trans" indicates, that which is at once between disciplines, across disciplines and beyond all disciplines. Its purpose is the understanding of the present world, and one of its imperatives is the unity of knowledge. (p. 37)

The three pillars of transdisciplinarity are: the levels of reality, the logic of the included third party and complexity, these pillars determine the methodology of transdisciplinary research.

- a) Reality levels
 - i) Training based on three levels of the person's reality

Espinosa, 2011, refers to Galvani, 2007a, on the three types of learning linked to three main dimensions or levels of reality of the subject:

- Linked to the theoretical-epistemic or cognitive level, we sought to learn to think, through research and through the 3 pillars of transdisciplinarity and the 7 principles of complexity, trying to generate complex thinking;
- Related to the practical level, emphasis was placed on learning to dialogue, distinguishing and linking disciplines, assuming their limits and complementarities, seeking their interaction through dialogue (open versus discussion or persuasion) and collective exploration;
- Linked to the ethical or existential level (reintroduction of the sensitive and ethical dimensions), we worked with the perspective of learning to learn about self-knowledge, our own prejudices,

social, historical and personal conditioning of our beliefs and certainties, our inspiration and vocation, affinities, limits and possibilities, but also to generate reflections on knowledge and knowledge of knowledge. (p. 42)

ii) Object reality levels

Nicolescu, 2009, refers to two levels of reality, he indicates that these are different if, in passing from one to the other, there is a rupture of the laws and a rupture of the fundamental concepts (e.g. causality) (p. 23). According to the object in nature, two realities are given:

- Macrophysics
- Microphysics

iii) Levels of social reality and in the subject

According to CeuARKOS, 2016, and mentioning De La Torre and Moraes, these levels of reality are given by the following:

- Physical-biological
- Emotional
- Psychic

iv) Subject's reality levels

According to CeuARKOS, 2016, and by mentioning D'Ambrosio, 2007 and Nicolescu, 2006, these levels of reality are produced by the following:

- Individual
- Social
- Planetarium
- Cosmic

b) The logic of the included third party

The knowledge generated causes the existence of contradictory pairs that are mutually exclusive, such as knowing and not knowing, in this respect Nicolescu says that the logic of the included third party is used, which allows to distinguish the elements without separating them and to connect them without confusing them, this understanding is given by the fact that there is a "third term T that is both A and not A".

The included third party is also known as the "logic of inclusion", where contradictory coexist, it serves to understand how to move from one level of reality to another, helps to explain that a coherence at another level is an incoherence, then it is transdisciplinary and transformative, according to Bohr, the included third party is the complement that tends to merge and merge, without confusion...

The research applies the logic of the included third party with its respective laws, as referred to by Max-Neef, 2004:

“First law of transdisciplinarity: 'The laws of a given level of reality are not self-sufficient to describe the totality of phenomena occurring at that same level'. (p. 15)

Second law of transdisciplinarity: 'Every theory at a given level of reality is a transitory theory since it inevitably leads to the discovery of new levels of contradiction at new levels of reality'. (p. 16)

Third law of transdisciplinarity: 'Only because of what is not, it is possible for what is to be, and only because of what is, it is possible for what is not to be.'”. (p. 21)

c) The complexity

Morin, 1998, mentions that the term complexity can only express our confusion, confusion and inability to define in a simple way and put our ideas in order. The simplifying modes of knowledge mutilate more than they express those realities or phenomena they try to account for, it becomes evident that they produce more blindness than elucidation, a problem then arises. The word complexity carries with it confusion, uncertainty, disorder. Its first definition cannot provide any clarity: that which cannot be summarized in a master word, that which cannot be reduced to a law, that which cannot be reduced to a simple idea, is complex.

It is a matter of exercising a thinking capable of dialoguing and negotiating with reality.

For Nicolescu, 1996, complexity is everywhere, in all the exact or human sciences, hard or soft. Social complexity points out, to the point of paroxysm, the complexity that pervades all fields of knowledge. (p. 33)

Transdisciplinarity is the desire to possess the most complete knowledge possible, it seeks to link knowledge located inside and outside the academic field (in our case the university), it determines the demand for usable knowledge, it integrates new knowledge, it uses the dialogue between two or more disciplines, it has the vision of reality as a whole, the approach that transdisciplinarity assumes makes different knowledge connect, thus accessing the globality and integration of reality.

In this field of complexity, the systemic-organizational, hologrammatic, retroactive, recursive, dialogic, self-eco-organizational, reintroduction of the cognizing subject, ecology in action and alienation principles are those that also allow the construction of a systemic knowledge, so that different nexuses are considered and uncertainties are faced; thus counterposing the fragmentation of knowledge with the integration of dispersed knowledge, avoiding simplifying and reductionist ideas of multiple facts, they try to modify thinking and leave aside the traditionalist paradigm, then they correlate with the proposal of university omniknowledge.

Cause and effect:

Chacón, 2015, mentions Morin (2007) who indicates that: "the cause acts on the effect and the effect on the cause" (p. 99). Therefore, the response or feedback obtained will change the course of the initial action, since it can be "inflationary or stabilizing" (Morin, 2007, p. 99), positive or negative. (p. 77)

For Sandre, within the recursive principle: products and effects are at the same time causes and producers of that which produces it. It breaks with cause-effect linearity, and leads to cyclical self-organization (p. 1)

The effect of a given cause is conditioned by some factors, and may lead to the assumption that this observed effect has only the variables under study as the only elements influencing the result. (Guzmán and Peeters, 2006, p. 1)

In the new paradigm of science the subjective acquires a new hierarchy, the mechanistic model is replaced by a probabilistic one, causal relationships are neither direct nor unique, each effect is the result of many causes including desires, fears, apprehensions, longings, fears; the relationship between cause and effect is relative, proportional; categorical statements are no longer accepted; and there is no longer any doubt that the observer's vision influences the phenomenon. (Lifshitz, 2019, p. 1)

Cárdenas and Andrade, 2020, mention the following: complexity theory emerges as a proposal and opportunity, in the face of the notable epistemological and explanatory gaps of the hard sciences (Morin, 1977), so called because of their particularity of understanding reality and the phenomena that compose it, based on biased, disjunctive, hierarchical and limited visions, hierarchical and limited, which reduce phenomena to cause-effect logic, and avoid uncertainty and non-linearity, that is, they restrict knowledge to a linear logic that scarcely takes into account the dialogue of knowledge, transdiscipline or the possibility of jointly weaving knowledge. (Andrade, 2018a). (p. 1)

Thus, cause and effect can be transformed reciprocally, therefore, cause becomes effect and effect becomes cause, but it must be taken into account that there is no effect without cause, in any case there is the phenomenon of retroaction, in which there are no determinisms that are absolute.

When linearity is excluded, there is an incoherent manifestation that encompasses a great sensitivity to initial conditions, there is no direct relationship between causes and effects, emergencies arise, imbalances, interruptions and uncertainties occur, and it is here where complexity provides flexibility, opportunity in responses and adaptability.

The cause and effect relationship is present in the individual, society and the environment, so that every action causes a reaction, a consequence or a result.

Among the causes that produce knowledge are the teaching-learning processes, cognitive processes, observation, analysis, experience, memory, reception of information, in addition to the development of creativity, providing the ability to solve problems and the execution of practice.

The complex causality:

Causality should be understood as the relationship between cause and effect, it is the cause or origin of something as its result, it is the effect or consequence, the causal nexus, it is the axis of union between a cause and its effect.

For Acosta and Bravo, 2015, in reference to causality they say:

“The approach of causality based on complexity, proposes a different model of analysis, where causes are neither unique, nor multiple, but complex; moreover, the new theories of complexity provide a new way of apprehending reality, and help to distinguish a complex problem from a linear one or to recognize when one transforms into the other. The causality approach based on the complex system proposes a different model of analysis, which becomes a new way of learning reality and understanding behavior and the social environment; these new theories help to distinguish a complex problem from a linear one”. (pp. 45-46)

It should be understood that complex causality does not renounce the presence of linear causality, only that complex causality has the scope to complex systems that are present in the environment, from the approach that has the complexity, but in parallel you can continue to analyze the non-complex systems from the point of view of simplicity.

But one has to be prepared, because complexity and simplicity or simplicity and complexity can be interchanged, so situations of imbalance and sudden changes can arise, for which one has to be ready to recognize these situations.

Complex causality is capable of integrating, of having dialogical relationships, uncertainty, order and disorder, processes, phenomena and concurrent and antagonistic facts, where the effects are, at the same time, causes and producers of that which produces them, thus eliminating linear causality. This complex causality has a necessary and temporal link.

In this context, complex causality for the present research incorporates the individual as a complex being: rational and delirious, hard-working and playful, empirical and imaginative, economic and dilapidator and prosaic and poetic (Morin, 1999, p. 27), while society has its own dynamics, is a producer, has a systemic character in which knowledge is linked, generates uncertainty, carries out interactions, etc. Finally, the environment, which is nothing more than that which surrounds the individual and society, are cause and effect and vice versa.

Now, as for the university, there we also find causality, through the teaching-learning process, interactions, the university is a producer of transformations, it responds to the needs of society and the environment, although in a limited way.

Table 3. Identified elements that cause or generate knowledge

No.	IDENTIFIED ELEMENTS THAT CAUSE OR GENERATE KNOWLEDGE
1	Putting theory into practice

2	Motivation
3	Understanding of reality
4	Need to know
5	The need to solve problems
6	Attitude
7	Experience
8	The teacher's role in motivating the student
9	Interest
10	Use of appropriate teaching-learning strategies
11	Research
12	The needs of the environment
13	Internal commitment
14	The need to apply knowledge
15	Having opportunities in the environment
16	Study

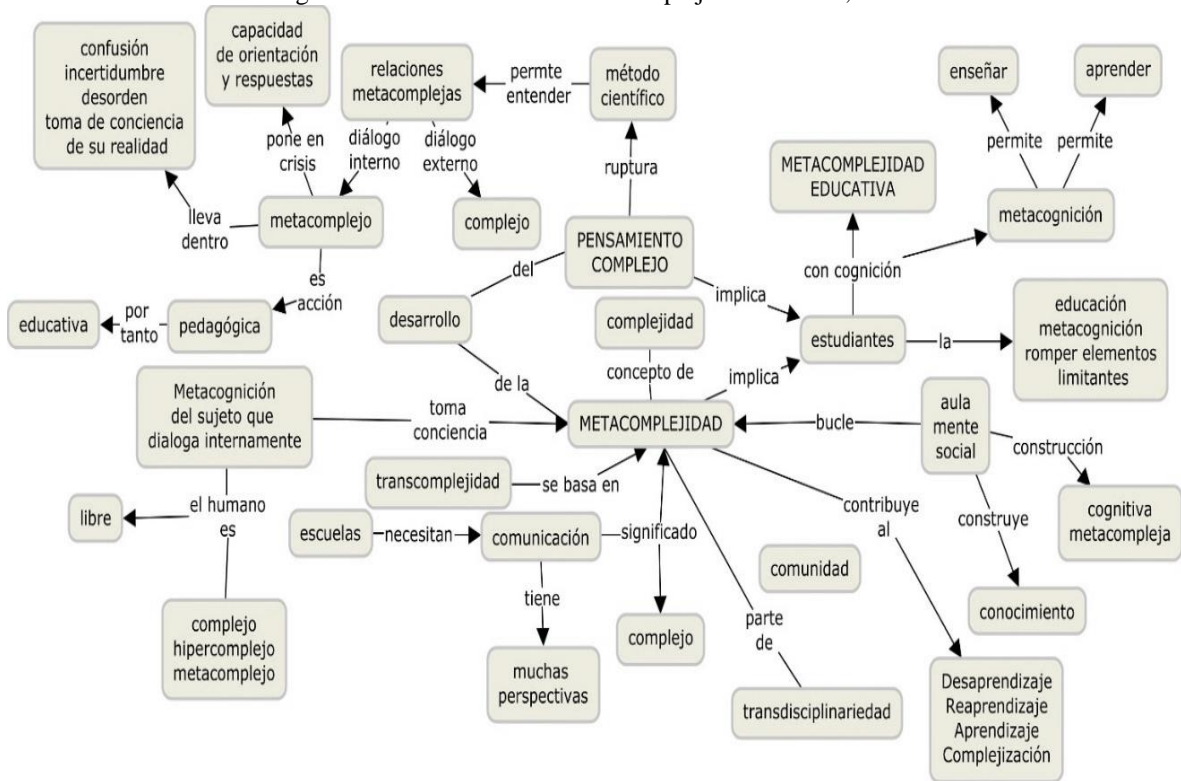
Note: The most relevant elements that cause or generate knowledge are detailed. Own elaboration, 2021.

Additionally, knowledge is caused or generated by cognitive processes, perception, memory, by information acquired from oneself, society and the environment, by the processes performed by thought, representations and abstractions of reality, the interaction that occurs between the subject and the object, in turn when knowledge itself generates knowledge and by the relationships between abstract or physical entities.

The effect produced by knowledge is given by the understanding of emotions, decision making, understanding of reality, development of skills, problem solving, adaptability, application of theory to practice, identification of emergencies, how to cope with uncertainty and adaptation to the environment.

The other element that allows the construction of university omniconplexity is metacomplexity, which has its own connections.

Figure 3. Conexiones de la metacomplejidad. Pericón, 2021.



TRADUÇÃO FIGURA 3:

- confusion
- incertidumbre
- desorden
- toma de conciencia de su realidad:
- confusion
- uncertainty
- disorder
- awareness of their reality
- capacidad de orientacion y respuestas: orientation and response capabilities
- lleva dentro: carries within
- pone en crisis: puts in crisis
- relaciones metacomplejas: metacomplex relationships
- diálogo interno: internal dialogue
- metacomplejo: metacomplex
- complejo: complex
- diálogo externo: external dialogue
- permite entender: allows to understand
- método científico: scientific method
- ruptura: ruptura
- pensamiento complejo: complex thinking
- del: of
- desarrollo: development
- complejidad: complexity
- concepto de: concept of
- implica: implies
- metacomplejidad educativa: educational metacomplexity
- con cognición: with cognición
- estudiantes: students
- ensenar: to teach
- aprender: to learn
- permite: allows

metacognición: metacognition
 educación, metacognición, romper elementos limitantes: education, metacognition, breaking down limiting elements
 aula mente social: social mind classroom
 construcción: construction
 cognitiva metacompleja: cognitive metacomplexity
 construye: constructs
 contribuye al: contributes to the
 conocimiento knowledge
 desaprendizaje,, reaprendizaje, aprendizaje, complejización: unlearning,, relearning, learning, complexification
 comunidad: community
 parte de: parto f
 transdisciplinarietàad: transdisciplinarity
 complejo: complex
 implica: implies
 bucle: loop
 metacomplejidad: metacomplexity
 de la: of
 toma conciencia: become aware
 se basa en: is based on
 significado: meaning
 transcomplejidad: transcomplexity
 comunicación: communication
 tiene: has
 muchas perspectivas: many perspectives
 necesitan: needs
 escuelas: schools
 es acción: is action
 pedagógica: pedagogical
 por tanto: therefore
 educativa: educational
 metacognición del sujeto que dialoga internamente: metacognition of the subject who dialogues internally
 el humano: the human
 libre: free
 complejo, hipercomplejo, metacomplejo: complex, hypercomplex, metacomplex

Table 4. Elements involved in and related to metacomplexity

No.	ELEMENTS INVOLVED IN AND RELATED TO METACOMPLEXITY
1	Pedagogical action
2	Approach to realities
3	Classroom
4	Classroom-mind-social
5	Chance
6	Coexistence of opposites
7	Complexity
8	Communication
9	Complex consciousness
10	Confusion
11	Knowledge
12	Metacomplex cognitive construction
13	Knowledge construction
14	Worldview

15	Disorder
16	Dialogue
17	External dialogue
18	Internal dialogue
19	Teacher
20	Education
21	Emergencies
22	Teaching-learning
23	Student
24	Uncertainty
25	Interculturality
26	Intersubjectivity
27	Complex research
28	Transdisciplinary research
29	Metacognition
30	Motivation
31	World
32	Nature
33	Observation
34	Paradigm
35	Pedagogy
36	Thinking
37	Complex thinking
38	Complex processes
39	Educational processes
40	Reality
41	Complex reality
42	Reflection
43	Relationships
44	Religion
45	Semiotics
46	Human Being
47	Society
48	Awareness
49	Transcomplex
50	Transdisciplinarity

Note: The elements were subjected to an analysis to verify their effective connections. Pericon, 2021.

Although complexity and transdisciplinarity are ideas and concepts that have been circulating for a long time, it is in recent times that they are becoming more prevalent, both ideas are connected with society and education, to this, several people have associated the concept of metacomplexity, along with relevant aspects such as dialogicity, the human being, the world, the worldview, among others.

Metacomplexity is produced in the classroom, it is also related to teaching and learning, where the student's metacognition is present, it makes the student and his environment understandable, metacomplexity is confusion, uncertainty, disorder and awareness of reality, it is connected with educational processes, it has internal and external dialogicity, admitting the individual and social

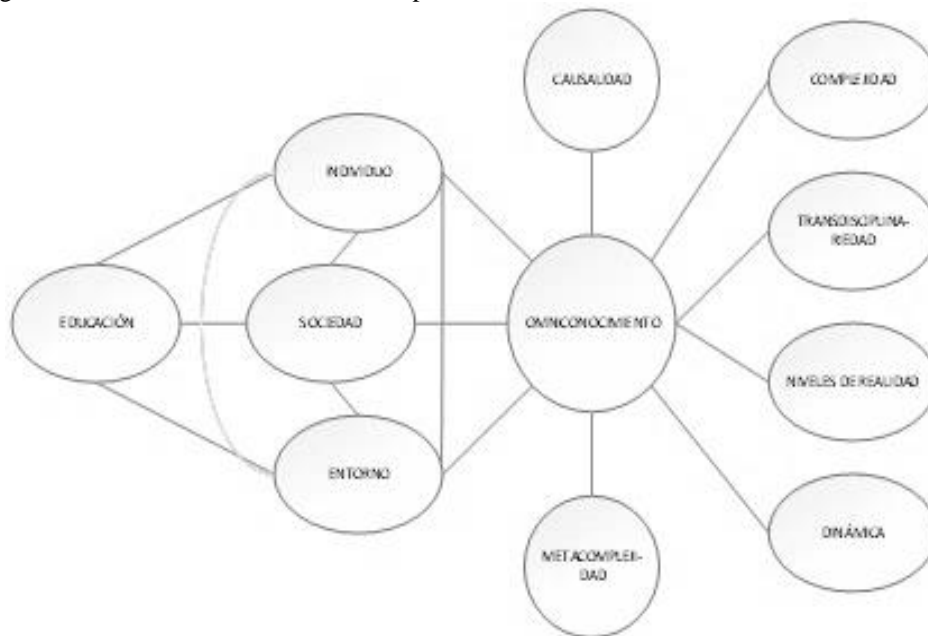
construction and deconstruction, it is complex consciousness, it has the ability to locate and respond to various problems that arise from different situations.

In order to have a greater objectivity in the components of metacomplexity, the following is detailed as argued by Pericón, 2021:

"... the elements that intervene and are related to metacomplexity are in the complex, transdisciplinary, transcomplex, metacognitive, complex thinking, complex consciousness, society and education, facilitating the understanding of oneself and the world. It is observed and identified that metacomplexity incorporates uncertainty, disorder and awareness of reality, in addition to having the capacity to place answers in crisis. The foregoing determines that metacomplexity has a global scope and that it contributes to society and education as an integrating element and of application in development and knowledge, having the human being or subject as the preponderant participant. ... it has been possible to establish relationships between facts, which are actions that happen because of an effect or action, so this leads previously to mention that metacomplexity is intertwined with complexity, transdisciplinarity, the human being, the world, nature, cosmovision, education, awareness, cognitive, knowledge, the classroom, dialogue, research, thought, processes, emergencies, metacognition and reality. (pp. 52, 53 and 54)

So in all this context and to have a broad understanding of the new concept, referred to omniconocimiento, it should be said that it mainly focuses on useful knowledge, in an area where knowledge is abundant and are linked, it is also considered the validity and permanence of relevant knowledge for the individual once completed their university education can develop conveniently in the environment, then the first task is to locate and identify the macro connections that has the university omniconocimiento, for which the following scheme has been developed:

Figure 4. Location and macro relationships of the omniconocimiento. Own elaboration, 2021



TRADUÇÃO FIGURA 4:

EDUCACIÓN: EDUCATION
 INDIVIDUO: INDIVIDUAL
 SOCIEDAD: SOCIETY
 ENTORNO: ENVIRONMENT
 CAUSALIDAD: CAUSALITY
 OMNICONOCIMIENTO: OMNI-KNOWLEDGE
 METACOMPLEJIDAD: METACOMPLEXITY
 COMPLEJIDAD: COMPLEXITY
 TRANSDISCIPLINARIEDAD: TRANSDISCIPLINARITY
 NIVELES DE REALIDAD: REALITY LEVELS
 DINÁMICA: DYNAMIC

As can be observed, omniknowledge has elements that are provided by causality, in this case reality shows that for every phenomenon or fact there is a cause and an effect and that the effect can become a cause as mentioned above, it has elements of simplicity that are used to perform the analysis, warns about imbalances, allows integration and linking, considers the transformations within a context of uncertainty. On the other hand, we have metacomplexity, which comprises broad ideas, is not limited to specific concepts, includes metacognition from complexity, involves people and accesses to become aware of what has been learned.

The individual, society and environment are connected with education and omniknowledge, where the integrating element is knowledge, which is generated at different levels and in different ways.

In turn, knowledge from the perspective of complexity, has to be understood as multidimensional that moves in a spectrum of uncertainty.

At the same time, through transdisciplinarity, we seek to obtain an integral knowledge, which does not fragment knowledge, capable of dialoguing between different knowledge at other levels of reality.

At the same time, the ontological axiom shows the fundamental pillar of transdisciplinarity, and accepts that there are different levels of reality with different levels of knowledge and perception, where a level of knowledge reaches its real meaning within the existence of other levels.

The dynamics of the environment, conceives uncertainty, where knowledge must be able to self-organize, coordinating, synchronizing processes and possessing the quality of autopoiesis.

Having identified the characteristics of complex causality and metacomplexity, we proceed to build the university omniconocimiento, the same that determines the knowledge that is useful to face reality and develop in the environment.

The omniconocimiento is constructed by means of the volume of knowledge that the student assimilates, for which the student must have with himself interest and commitment, which will allow him to conduct himself in the environment.

While the useful knowledge is given by that multidisciplinary knowledge that the student must possess, avoiding fragmentation, (this is still the way of teaching in universities), so that he can solve problems and provide solutions, this knowledge is not limited only to academic knowledge, but also has to do with knowledge of personal development.

The useful knowledge must include the management of transdisciplinarity, so that a complete knowledge is obtained from multiple perspectives, also conceiving emerging knowledge, it is also useful the knowledge about research tools that allows the individual to identify the needs of the environment, it is important that the student has more hours of practice in relation to the theoretical classes, should learn about real cases and not only hypothetical, it is useful that he can have the knowledge to develop competences framed in the application of skills, attitudes and values.

The interaction between complex causality and metacomplexity allows the construction of omniconocimiento knowledge.

Table 5. Interactions oriented towards omniconocimiento

<i>CAUSALITY</i>	<i>METACOMPLEXITY</i>	<i>OMNI-KNOWLEDGE</i>
Practice theory Experience	Pedagogical action Approaching reality Classroom Classroom-mind-social Communication Knowledge Metacomplex cognitive construction Knowledge construction Teacher Education Teaching-learning Student Complex research Transdisciplinary research Observation Pedagogy Thinking Reflection Religion Semiotics Human Being Society	Useful knowledge is that which is practical and provides experience, starting from theory, for which it must be supported by the metacomplex elements that are pointed out, allowing the connection of coherent information and data.
Metacognition	Pedagogical action Classroom	Another useful knowledge is the use of metacognition,

	<p>Classroom-mind-social Knowledge Metacomplex cognitive construction Knowledge construction External dialogue Internal dialogue Teacher Education Teaching-learning Student Interculturality Intersubjectivity Metacognition World Paradigm Pedagogy Thinking Reflection Religion Semiotics Human Being Society Awareness</p>	<p>based on the metacomplex elements that it possesses, producing educational research developed during classroom experiences, in order to provide knowledge and control of the learning process, so that the learning of relevant properties related to information and data can emerge.</p>
<p>Need to know Need of the environment Need to solve problems Need to apply knowledge</p>	<p>Approach to reality Motivation Confusion Knowledge Metacomplex cognitive knowledge Knowledge construction Education Teaching-learning Uncertainty Intersubjectivity World Observation Paradigm Thought Reflection Relationships Religion Awareness</p>	<p>The satisfaction of needs is implicit in the human being and serves him to develop individually and in society, being able to interact with the environment, here the useful knowledge is determined by the ability to identify the deficiencies that must be corrected, using the limited resources that exist in a dynamic environment.</p>
<p>Motivation Attitude Interest Internal commitment</p>	<p>Approximation to reality Knowledge Knowledge construction Internal dialogue External dialogue Emergence Motivation World Thought Reflection Relationships Religion Human Being Society Awareness</p>	<p>Another useful knowledge is that of the value and principles of the human being involved in assertive behavior, relating it to the elements of metacomplexity, so that there is no deviation and the goals set for the individual are met.</p>
<p>Teaching-learning strategies</p>	<p>Pedagogical action Classroom Classroom-mind-social Communication Knowledge Metacomplex cognitive construction</p>	<p>There are several teaching-learning strategies, which must be aligned to the metacomplex elements that will be applied according to the situation, but they must have the ability to focus on cognitive skills and</p>

	<p>Knowledge construction Worldview External dialogue Internal dialogue Teacher Education Teaching-learning Motivation World Observation Paradigm Pedagogy Thinking Reflection Relationships Religion Semiotics Human Being Society Awareness</p>	<p>provide meaningful learning, so that knowledge is organized, with which the individual can attend, learn, think and solve problems, on the other hand, as it is known, meaningful learning occurs when new information makes sense or is related to existing knowledge.</p>
Research	<p>Pedagogical action Approach to reality Classroom Classroom-mind-social Communication Knowledge Metacomplex cognitive construction Knowledge construction External dialogue Internal dialogue Teacher Education Teaching-learning Student Uncertainty Interculturality Intersubjectivity Complex research Transdisciplinary research Observation Paradigm Pedagogy Thinking Reflection Relationships Religion Awareness</p>	<p>In turn, it is useful knowledge to learn to investigate, assuming the metacomplex elements with which it is related, which deepens the individual's knowledge of facts, phenomena or others, also helps to seek new knowledge, provide solutions to problems, in addition to providing meaning to reality.</p>
Environmental opportunities	<p>Approaches to reality Complexity Knowledge Worldview Education Emergencies Uncertainty World Observation Reflection Human Being Society Awareness</p>	<p>For this point, the useful knowledge is given by the knowledge of tools of analysis of the environment supported by the metacomplex elements, in such a way that one has a perspective of the reality at a specific point, to determine what is required and how to face the problems, gaining an advantage over the rest of the individuals.</p>
Study	<p>Pedagogical action Approach to reality Classroom</p>	<p>This useful knowledge is given by the knowledge of study techniques that must be</p>

	Classroom-mind-social Communication Knowledge Metacomplex cognitive construction Knowledge construction Teacher Teaching-learning Student Complex research Transdisciplinary research Metacognition Motivation Observation Pedagogy Thinking Reflection Relationships Religion Semiotics Awareness	connected to the elements of metacomplexity, these techniques serve the individual during and after his university life, which enhances learning, can be applied in different areas, allow organizing and retaining information, the techniques are multidisciplinary.
Complexity Transdisciplinarity	Approximation to reality Chance Coexistence of the opposite Complexity Complex consciousness Confusion Emergencies Uncertainty World Observation Complex thinking Religion Human Being Society Transcomplex Transdisciplinarity	Finally, complexity is useful knowledge, as it helps to identify the elements that are linked, reducing uncertainty and therefore it is not simplistic, on the other hand, transdisciplinarity, through the unity of knowledge achieves the identification of the different levels of reality, being able to dialogue.

Note: The relationship of reciprocal actions is described. Own elaboration, 2021

The omni-knowledge is composed of an abundant amount of knowledge, although there is a validity and permanence of knowledge, these are determined by the characteristics of the environment; University omni-knowledge in its generality is composed of specific knowledge, which has to adhere to multidisciplinary knowledge, since all knowledge is valid, to this are added the useful knowledge that are the basis of omni-knowledge and refer to the knowledge obtained thanks to the practice developed, metacognition, identification of deficiencies, application of values and human principles, teaching-learning strategies, learning to investigate, tools of analysis of the environment, study techniques, complexity and transdisciplinarity.

It is assumed that, with the university omni-knowledge, the individual will be able to develop within society and the environment, will have the ability to move in the different levels of reality; this new concept is not only about including the subjects that are taught within the curricula, thus, research tells us that we must have a comprehensive knowledge, which is outside the classroom, complemented with other types of knowledge.

Complex causality and metacomplexity have been a factor that contributed to build the university omniconocimiento framed in reality, a key aspect that is also cause and effect, is constituted by the teaching-learning, where the teacher plays an outstanding role in helping the student to consolidate their knowledge, although the acquisition of knowledge is not directly delegated to the work of the teacher.

The research also shows that education is not connected with the environment, since what is taught is not being applied once the university studies are finished, which makes us rethink the knowledge that is really necessary or useful for the individual.

There is still fragmentation of knowledge and this is produced by the characteristics of teaching and the way of configuring the curricula. Thus, the idea of omni-knowledge re-emerges as a solution, since it allows access to all types of knowledge and is not limiting.

The university omni-knowledge, although it is complex by the different relations of which it is composed, by its understanding and application, is a source to face the environment and reality, which will reduce uncertainty.

Additionally, the environment and reality are the focal points for the processes of change to occur, framed in the dynamics that determine a precise moment, which needs an answer, therefore, the answer is the use of the omni-knowledge that will now be available to individuals.

5 FINAL CONSIDERATIONS

The present research constitutes an original work, in which the scientific methodology has been applied, accompanied by the complex and transdisciplinary components, thus, in the course of the research, novel results have been obtained, which is related to the objectives and the hypothesis proposed, at the same time, the questions formulated, the proposed objectives were answered and the hypothesis has been verified.

It was found that there were no previous research references where the relationship between complex causality and metacomplexity is mentioned.

On the other hand, having clearly identified the elements of complex causality and metacomplexity, significant information was generated, which connected omnisknowledge with the individual, society and environment, starting from an educational basis, to which were added the potentialities of complexity and transdisciplinarity, due to the characteristics that these concepts possess.

The elements identified allowed the construction of university omniconocimiento, which is not limited only to possessing specific knowledge, but opens the door for the individual to access all types of knowledge, in addition to providing the individual with the tools to face the environment and reality, the main aspect being the management of useful knowledge.

It was specified that useful knowledge is generated by: the execution of practice, the use of metacognition, the ability to identify deficiencies, the application of human values and principles, the use of teaching-learning strategies, the application of tools for analyzing the environment, knowledge of study techniques and knowledge of complexity and transdisciplinarity.

The relationship between complex causality and metacomplexity was given by the correspondence, connection, linkage and/or religiosity of facts; situation that has allowed formalizing the identification of the elements that are the basis of the construction of university omniconocimiento, these elements in its broad context outside the complex causality and metacomplexity are education, reality, needs, practice, experience, research, thinking, awareness, uncertainty, emergencies, uncertainties, problems, knowledge, complexity, transdisciplinarity, the individual, society and the environment.

Meanwhile, the notion of knowledge refers to the implicit link between the individual and reality, where knowledge is produced in a complementary way thanks to the accumulation and processing of data and information about the environment, it is the understanding of theory and practice with its corresponding processing, knowledge is affected by reality, in turn, two elements are involved in it: the subject and the object, it is objective and subjective, it has dynamic characteristics, it is characterized by being true according to time and place, it also includes cognitive processes.

The dynamics of the environment has led to the emergence of supreme and religious knowledge, in this sense it is a great support to resort to the complexity and transdisciplinarity, in turn the field of research has required to resort to these two components, in order to reach the object of study.

Complexity and transdisciplinarity are connected and have factors related to knowledge. Transdisciplinarity helps to respond to complexity, because it incorporates the levels of reality, the third included and complexity, in a complementary way it brings with it a set of knowledge where the processes presented by the different disciplines are included, disciplines that are taught at the university, it does not allow the fragmentation of knowledge, on the contrary it is oriented to the unity of knowledge, it approaches as much as possible to the phenomenon or fact, it deploys in the individual the conscience and coherence to develop in reality; complexity, on the other hand, integrates all areas, where education, society and the environment are also inserted, develops in the context of reality, includes cognitive aspects because they are complex, confronts knowledge, innovates and adapts to the dynamic environment, recognizes networks that intertwine elements, reaches the different scientific areas and seeks solutions to current problems.

The construction of the concept of university omni-knowledge has been based on the following aspects: the capacity of the individual to integrate and access all types of knowledge, using for this the elements provided by complex causality and metacomplexity, so that he/she can face the environment and reality, in addition, the cause - effect and effect - cause loops have been considered, the response to emergencies and the reduction of uncertainties have been taken into account, all knowledge was integrated, the characteristics of practice and experience on the part of the individual have been founded, metacognition was taken into account, the identification of the needs of the human being has been operated taking into account teaching-learning strategies and research, limiting aspects were not suppressed, the management of uncertainties was carried out and the knowledge that is really useful was analyzed, with which the construction of the concept of university omni-knowledge was structured.

The university omni-knowledge becomes a concept that has the sufficiency to change the reality of the educational environment, which favors the individual-society-environment, since it allows for greater efficiency and effectiveness in the activities developed by the individual.

The university omni-knowledge provides the necessary elements to the universities to modify the curricula, adapting them to the needs and reality of the environment, at the same time, it is possible to have professionals with new aptitudes and with optimal capacities to develop appropriately in the environment.

This new concept contributes so that the new professionals can be aware of what is required of them, not limiting themselves to the assimilation of knowledge obtained at the university, therefore, secular, popular, traditional, peasant and other knowledge is also taken as valid, which will generate better life opportunities and will also make individuals build their life project..

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CHAPTER 24

Porcelain veneers, minimally invasive dental treatment in the antero-upper segment: case report

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ABSTRACT

Aesthetics today is an important part of social and professional relationships. Ceramic restorative treatments free of metal or metal core have allowed us to advance in aesthetic results, especially in the anterior area where more aesthetics are required. Porcelain veneers are a restorative treatment that has proven its worth after many years of clinical use, especially in the anterior sector due to its aesthetic implications, with success rates close to 95%.

The objective of this presentation is porcelain veneers as one of the adhesive reconstructive treatment alternatives that provide excellent dental aesthetics with minimal removal or wear of dental tissue.

Keywords: Porcelain veneers, veneers, dental aesthetics, metal-free ceramics.

1 INTRODUCTION

We currently live in a society that is increasingly obsessed with aesthetic appearance, often imposing this aspect on the purely professional. Patients go to their dentist looking for help. The face is the first part of the body that is seen when we interact; therefore, facial expression is the most important aspect in aesthetics since any defect can cause rejection by the observer or even, on many occasions, insecurity or complexes in the person who possesses it. This is the reason why we must offer our patients special attention in the aesthetic techniques that are being developed year after year^{1,2}. Patients come to their dentist for help, often complaining of aesthetic problems that can be remedied, often with treatment limited only to prosthetic therapy. When the aesthetic compromise belongs to a more complex clinical nature, it is the Clinician's task to explain to the patient that the solution to their problem lies within a broader rehabilitation framework. Therefore, a treatment protocol must be chosen that allows formulating a good prognosis in the medium and long term, not only in aesthetic terms, but also with respect to biological and functional aspects.

6

The progress of composites, as well as the evolution of ceramics, is a faithful exponent of the demands of the population. In this way, porcelain veneers have made their way among the different reconstructive techniques of the smile³.

Laminate veneers can present different depths of wear depending on the planning, which depends on some factors such as: the quality of the dental substrate, the color of the dental substrate, the spatial location of the tooth in the dental arch and the nature of the material itself. .⁴. The growing aesthetic need of patients, especially in recent decades with the appearance of adhesion systems to enamel and dentin, together with innovative aesthetic materials, modern application techniques and their potential for use, have given extraordinary results with the appearance of the so-called "metal-free ceramics"; This system is applied in different aesthetic treatments. One of the applications is porcelain veneers, being a very conservative alternative compared to the preparation of full crowns. Veneers are a thin layer of porcelain that is cemented to the vestibular surface of the anterior teeth in order to improve the shape and color. One of the great advantages is that the reduction of dental tissues is minimal. The cemented restoration is extremely strong, which is the result of the excellent bond between the enamel and the porcelain by means of the adhesives in conjunction with the resin cements. The adhesion of this type of restorations is of such magnitude that it is almost impossible to remove it when all the steps have been carried out properly. This restoration system can be used to improve the aesthetic appearance of teeth in case of abnormal color, modification of tooth shapes, correction of dental fractures and correct diastemas, among others.⁵

2 CASE DEVELOPMENT

Female patient aged 65 years, presents for consultation, reason for consultation: I want to get some crowns so that my teeth do not look ugly and broken. (Fig. 1 and 2).

It was explained to the patient the excessive wear of good dental tissue that will be done to place the crowns that she requests. She was given a treatment option that is more conservative, aesthetic and minimally invasive, which was the option of porcelain veneers.



Figure 1



Figure 2

The preparations began in the dental organs, 11,12,21 and 22, the wear was in the vestibular and a little on the palate, the dental floss of 000 zeros was placed to be able to carry out the gingival retraction and thus take the impression. (Fig.- 3)

Figure 3



Before taking the impression, the retraction cords were removed. The final impression was taken with a tray prefabricated with heavy and light polyvinylsiloxane silicones. (fig.- 4).

Figure 4



Once the final impression was made, the provisional ones that are used for short periods were made, their function is to provide a chewing surface and protect the **dental and periodontal tissues such as dentin and dental nerve** . (Fig – 5).

Figure 5



The veneers were tried before cementation, the sealing was checked and they were good for cementation (Fig. – 6)

Figure 6



Having the veneers ready, they continued to be cemented. The use of phosphoric acids for the treatment of dental surfaces is mainly based on the increase of the contact surface by creating microporosities, a purely physical phenomenon. In addition, acids are also able to increase wettability or free surface energy, allowing a more intimate contact between the resin and the enamel, which also promotes adhesion. It was recorded for 20 sec . The teeth were removed with plenty of water to dry and then place adhesive (Fig.- 7). The adhesive itself is the third part of the total etch adhesive system and is composed primarily of hydrophobic and light- curing monomers , which must penetrate the dentin for primer to form the hybrid layer. ⁷

Figure 7



For cementation, celluloid strips were placed between the dental organs to prevent the cement from running and sticking with the neighboring tooth (Fig. – 8). Adhesion is the mechanism that joins two interfaces in close contact. The understanding of this mechanism was fundamental for the evolution of Dentistry as we know it today and key to the development of ceramic veneers. The purpose of the adhesive restoration is to achieve a tight, sealed adaptation between the restorative material and the tooth substrate .

⁷

Figure 8



Cemented veneers, surplus removed (Fig.9)

Figure 9



BEFORE



AFTER



3 CONCLUSION

The great potential of bonded ceramic restorations can be understood because the relevant scientific and clinical parameters associate biology, function and mechanics. Ceramic veneers also provide the dentist with an effective aesthetic treatment modality. Even if aesthetics is not the primary goal, it should be taken into account. Modification of the shape, position and color of the anterior teeth causes important changes in the smile, which, in turn, can contribute to improving the personality and social life of patients. Porcelain veneers, initially used to treat the different types of tooth discoloration, have been progressively replaced in these cases by more conservative treatments such as chemical whitening and micro and megabrasion .⁸


Currently the main indications for the elaboration of veneers are 2: 1.- to modify the color and 2.- to alter the shape and texture of the dental elements, it is possible or not to work on the length and dental alignment, minimize or close gaps , restore fractured or deformed teeth and congenital anomalies.⁹

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CHAPTER 25

From creation to disintegration of Yugoslavia

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ABSTRACT

Yugoslavia has a unique history in the 20th century. This article proposes to show the history of this country composed of six republics – Serbia, Montenegro, Croatia, Bosnia-Herzegovina, Slovenia and Macedonia. It should be shown how internal

rivalries combined with external factors such as the world system contributed to its disintegration. Yugoslavia's relationship with hegemonic powers such as the United States and the USSR and with large financial institutions such as the IMF and the World Bank will also be analyzed. The place occupied by this state in the world system is essential to explain its collapse.

1 INTRODUCTION

Yugoslavia has a unique history in the 20th century. This article proposes to show the history of this country composed of six republics – Serbia, Montenegro, Croatia, Bosnia-Herzegovina, Slovenia and Macedonia. It should be shown how internal rivalries combined with external factors such as the world system contributed to its disintegration. Yugoslavia's relationship with hegemonic powers such as the United States and the USSR and with large financial institutions such as the IMF and the World Bank will also be analyzed. The place occupied by this state in the world system is essential to explain its collapse.

The country, located on the Balkan Peninsula, has suffered over the centuries numerous political, economic and especially cultural influences. These influences came from empires such as Austro-Hungarian, Ottoman Turk, as well as Slavic peoples. Religious influences are the most visible. Croats and Slovenes are Catholics. Serbs are Slavs and thus inherited orthodox Christianity. Bosnians are Muslims. In addition to the predominant ethnicities, there are minorities such as Albanians, Hungarians, Gypsies and Vlachs . The Albanian minority is very strong in Kosovo . All of them helped to form the Yugoslavian mosaic. According to Tito, the country was made up of “six republics, five nations, four languages, three religions, two alphabets and a single party” (PADRÓS, 1999: 140).

The republics coexisted peacefully while their greatest leader – Joseph Broz Tito – lived. Nationalist insurgencies began well before the 1990s, but were repressed by the government. The president promoted population movements in order to mix ethnicities. It can be said that, during the country's existence, Tito was the biggest promoter of “Yugoslav national identity.” The government was centralized, dictatorial in character and had a one-party regime – the Communist Party, later called the Communist League of Yugoslavia. Tito guaranteed the republics a relative autonomy that was protected by the constitutions. This helped to contain nationalist insurgencies.

In the 1970s, the country showed difficulties in responding to the demands of the population and regional identities were strengthened. With the weakening of the state, the Yugoslav identity also weakened. The desire for secession increased especially in the wealthier republics such as Croatia and Slovenia. These wanted to follow an independent path mainly in the economic sector. They believed that the central government got in the way of their decisions. In Kosovo, the poorest region of the country with a large Albanian population also opted for separation from Serbia, even though the region did not seem to gain anything from secession.

In 1980, Tito's death drastically changed the path to be followed by the country. It was one of the main factors for its dissolution. In the late 1980s, the collapse of communism in the Soviet republics contributed to the loss of legitimacy of the Yugoslav state. Over time, the country increasingly lost this legitimacy. Adherence to the neo-liberal system brought numerous negative consequences. The resulting crisis also worsened the economic, social and political situation. The civilian population felt helpless for not having their rights guaranteed, which were guaranteed by the socialist model.

In the 1990s, as Europe consolidated its integration, Yugoslavia did the opposite. The rampant crisis, unemployment, misery helped to foment the already existing ethnic and nationalist rivalries. The contradictory actions of some countries such as the European community stem from the lack of understanding of the conflict – civil war or international conflict. The NATO air strike in Kosovo is one of the most controversial examples. Many consider it an imperialist action by the United States. The article will also show the interdependence of Yugoslavia, located in the semi-periphery of the world system with the hegemonic powers.

The fact that conflicts are commonly characterized as simple ethnic rivalries depoliticises the issue. It is not possible to look at the conflicts and characterize them merely as an internal Yugoslavia issue. The article also mentions other factors such as capital, the world system, neoliberalism. Any internal event has the capacity to reflect on the external scenario and encourage the action of others from other countries. The dissolution of Yugoslavia has an intrinsic relationship with the international situation of the moment and with the strategic interests of the great powers.

2 HISTORICAL BACKGROUND

The territory that today forms the former Yugoslavia has undergone numerous transformations over the centuries. In the 6th and 7th centuries, Slavic tribes from Russia settled in the south of the Balkan Peninsula. Croatians came from southern Poland. In the Late Middle Ages, the influence of the Byzantine Empire spread Orthodox Christianity. In the 11th century, the Kingdom of Serbia was formed, comprising the territories of Serbia and Montenegro.

Turkish invasions in the 14th century defeated the Serbs at the Battle of the Maritsa River. After this event, the Serbs would only see their independence in the 19th century. This Turkish invasion caused Serbs to move northwards creating a demographic vacuum in the regions of Kosovo and Macedonia. As

Padrós shows , “this problem was solved by displacing the Albanian population already Islamized and incorporated into the Turkish Empire, and this was the beginning of the presence of Albanians in the south of the future Yugoslavia” (1999: 138). With an Austrian and Catholic population, Croatia and Slovenia suffered mainly cultural influence from the Habsburg Empire .

In the 20th century, the first major event was the Balkan Wars. The first took place between 1912 and 1913. Greece, Serbia, Montenegro and Bulgaria united against the Ottomans and formed the Balkan League. At the end of that war, Albania came out independent. The end of the war came with the Treaty of London in 1913, but it did not please the countries. "Bulgaria did not accept dividing Macedonia with Serbs and Greeks, with a view to dominating the Balkans, and therefore proceeded to attack Serbia, with the support of Austria-Hungary" (SEVERO, 2011: 55).

This was the trigger for the second Balkan war. Bulgaria faced Serbia which was supported by Montenegro, Romania, Greece and the Ottomans. Bulgaria was defeated and Serbia as a regional power. At the end of the Balkan Wars, the Ottoman Empire in Europe was reduced to a small portion of land in the south; Serbia gained control of Macedonia and doubled the size of its territory and population. (HUDSON, 2003).

3 THE FORMATION OF YUGOSLAVIA AND THE WORLD WARS

In 1914, the peninsula was the stage for the outbreak of the First World War. In Sarajevo, the heir to the Austrian throne Franz Ferdinand was assassinated by Gavrilo Princip , a Bosnian -Serb student from the Black Hand group . It is worth remembering that Bosnia and Herzegovina had been annexed to the Habsburg Empire in 1908. At the beginning of the war, Austrians tried to occupy Serbia twice, but were defeated. But later, the Serbs did not resist the German occupation. The region would only be liberated in 1918 with the help of the British and French armies.

In 1915, the Yugoslav Committee to work in favor of the union of the South Slav peoples was formalized in London. And at the end of the First World War, the Kingdom of Serbs, Croats and Slovenes was formed, which a year later received the name Yugoslavia. Thus, World War I combined with the dissolution of the Austro-Hungarian Empire and the Ottoman Empire contributed to the formation of the new state. Western countries supported the formation of Yugoslavia, as they saw it as an interesting strategic space to make this their area of influence.

But the newly formed country faced several problems: there was no acceptable leader for all units, the form that the state should take on unitarism or federalism was also in doubt. In addition, the country was made up of economically disparate regions and the economy in general was weak. Agriculture was the main activity. Industrialization advanced in the interwar period, mainly with the help of Germany, and mining gained prominence. However, Yugoslavia was heavily dependent on international trade, which made it vulnerable to fluctuations in the foreign market.

In 1921, the first Yugoslav Constitution was proclaimed, adopting Unitarianism as a form of state. The constitution allowed for the decentralized administration that has been seen throughout most of the country's existence. The Communist Party of Yugoslavia (CPY) stood out on the political scene by promoting a “Yugoslavism” above regional and ethnic particularities. Marshal Joseph Tito was a great propagator of this idea.

Political instability and economic weakness characterized the country in the 1920s. At that time there were disputes with Italy over the port of Rijeka in Croatia. The region was annexed to Italian territory in 1924, which forced a kind of “Italianization” of the resident Croats. The situation would only be resolved after the Second World War when Yugoslavia definitively occupied the region. In the early 1930s, the country was under the dictatorship of Serbian King Alexander, who was assassinated in 1934 by the Ustasha group, the Croatian fascist movement.

During World War II, Yugoslavia was occupied and divided by Germany, Italy, Hungary and Bulgaria. The Nazi-backed Ustasha movement took control of the country. Its aim was to form a “pure” Croatian state. In this way, several massacres were promoted. The most famous was the massacre of Serbs in Krajina, Croatia. Resistance movements did not take long to appear.

As Vizentini (2003) states, resistance movements ended up becoming a form of people's war, which in many cases represented not only a struggle against the invader, but a class conflict. The workers, tortured by the Nazis, organized themselves into guerrillas and formed a strong expression of the resistance movement.

Effective resistance came with the Partisans, members of the CPY. It was they who, practically single-handedly, managed to free the country from the Nazis. In this scenario, the figure of Josip Broz Tito, secretary general of the CPY. Even during the war, meetings of the Anti-Fascist Council for the National Liberation of Yugoslavia (AVNOJ) determined that federation was the form of state. It was this council, of which Tito was a member, that provisionally took over the country after the war.

4 THE CONSOLIDATION OF YUGOSLAVIA AND THE COLD WAR

Tito took control of Yugoslavia and was widely accepted. The provisional government introduced important changes: it structured a basic state apparatus centralized in the federal government, nationalized the exploitation of mineral resources, communications and foreign trade. Industries, companies and financial institutions were also nationalized. This showed that Yugoslavia was following the political and economic model of the socialist countries. With respect to agriculture, most of the land remained under private control.

The first Constitution of the now Federative People's Republic was published in 1946. The immense diversity due to the country being composed of a multi-ethnic population was protected by the constitution. It formalized the right of succession of republics. The first fifteen years of the country, made up of six republics – Serbia, Croatia, Slovenia, Macedonia, Montenegro and Bosnia-Herzegovina were peaceful.

Tito's government was centralized and based on the structure of a single party – the Communist League. In the years in which he was in power, he sought to discourage conflict between ethnicities. For this, it encouraged the displacement of populations in order to mix ethnicities. The objective was to consolidate the idea of a Yugoslav identity above all else (PADRÓS, 1999). Thus, according to Hobsbawm, “the great achievement of communist regimes in multinational countries was to limit, within them, the disastrous effects of nationalism” (1990: 205).

Differences between Tito and Stalin caused the country to be expelled from the Cominform in 1948. Among the differences were the port city of Trieste, the formation of a possible Balkan Federation that could disrupt Stalin's plans regarding Central Europe. But the main difference was that Tito vehemently refused any intervention by the USSR with the desire to chart an independent path.

The consequences of this rupture in favor of national communism (SEVERO, 2011) were enormous: trade deficit, loss of basic necessities and manufactured goods, increase in arms expenses. The solutions for this were to base the economy on self-management, which resembled market socialism. This strategy worked well in general and the growth of the industry was observed in the 1950s. But the biggest problem was the foreign trade deficit that could only be solved with foreign loans. The huge Yugoslav foreign debt was one of the main causes for the country's dissolution in the post- Cold War period.

Tito's authoritarian regime decentralized the administration and gave power to the regional Popular Committees created during the Second World War. The next constitutions reinforced this idea and gave more autonomy to the republics. However, decisions at the federal level were hampered by this. In addition, the leader decided to separate the Communist Party, called since 1952 the Communist League of Yugoslavia from the State. This action spread administrative command socialism. It is observed that the USSR made this decision from 1986 onwards with Gorbachev's reforms.

During the Cold War, Tito sought to balance himself between Western and Soviet powers. Thus, it did not participate in the Marshall Plan and COMECON. It hosted the First Conference of Heads of State of Non-Aligned Countries in 1961 (HOBSBAWN, 2008). This movement increased Tito's *status* on the international scene (SEVERO, 2011). But Serbia was supported by the USSR, as it was historically linked to its area of influence, unlike Croatia and Slovenia, which were supported by Germany (JUDT, 2008).

For many years, the republics coexisted without problems, in part due to the charisma of the president. But in the 1970s, tensions began to appear. Serbia, supported by Montenegro, tried to achieve greater centralism in relation to the other republics, which displeased Slovenes and Croats who supported the federation. The figure of Slobodan Milosevic gained strength, who defended integration under Serbian hegemony.

On the economic front, the scenario was disheartening. Unpreparedness of the domestic economy, rising unemployment and external indebtedness were some of the problems. This indebtedness was caused by the chronic dependence on foreign loans from countries such as the United States and Germany and also from institutions such as the IMF and the World Bank. As Severo states, “political choices and economic

mismanagement on the part of the Yugoslav leaders also contributed to the country's economy not being able to get rid of external indebtedness” (2011: 82). It is possible to say that these financial institutions moved the country's economy. Despite pressuring the country to open its market to the West, economic advances up to the 1970s must be considered. Yugoslavia, an 80% agricultural country, managed to overcome underdevelopment.

Linked to economic aid were IMF pressures for market liberalizing reforms. As Michael Doyle (2007) said, the IMF does not oblige nations to follow its rules, but negotiates the conditions for receiving aid. But these processes are never devoid of political intentions. This shows how indebted countries become vulnerable to central countries that intend to increase their dominance over peripheral regions.

Over time, the import-based economy and dependence on international trade and financial institutions became unsustainable. That's what happened when the crisis hit for good in the 1980s. The oil crisis in the 1970s and the ensuing global debt crisis are some of the causes of the recession. In addition, the loss of the country's strategic importance resulting from the end of the Cold War must also be considered. From an internal point of view, Tito's death in 1980 contributed to the destabilization of the country.

Unemployment and international trade were Yugoslavia's two biggest problems at the time. In addition, the country suffered from adverse factors such as a rise in the value of the dollar, the diversion of private loans, an increase in interest rates and low prices of primary products. The recession made the country unable to import its basic products. Its exports were also severely affected due to the unfavorable international situation at the time.

The exit came through a structural adjustment loan by the IMF and the World Bank. This loan was directly related to the implementation of Washington Consensus policy guidelines . The consequences of these directives would prove to be disastrous and separatism appeared to be the only chance to escape the crisis.

5 YUGOSLAVIA DISINTEGRATION AND THE END OF THE COLD WAR

In 1980 Tito's death brought what might be called the beginning of the end of Yugoslavia's history. The country was handed over to a rotating government among the eight autonomous republics and provinces (Vojvodina and Kosovo). This system did not work for long after the president's death, as the republics rose up in favor of independence.

The IMF provided two loans in 1979 and 1982 that had no practical effect. As a result, in 1983 the Long-Term Economic Stabilization Program was launched . This program was a package of market liberalization macroeconomic reforms (SEVERO, 2011). For the reform of the economic system, the Kraigher Commission was created in 1981 and for the reform of the political system, the Vrhovec Commission was created in 1985.

A controversial issue of the reforms was related to the extent of opening to the market. Some supported the restructuring of self-governing socialism. But the international community supported full adherence to market liberalism. To implement the reforms, the central government needed to regain its political authority. However, the republics were used to their autonomies guaranteed by constitutions and amendments for several years. This change brought several problems.

Early in the implementation of the reforms, the results were positive. There was an increase in exports, growth in GDP, surplus in the balance of payments. But soon after, a decrease in the population's quality of life was observed. The prices of basic consumption products increased as well as unemployment, which brought a general impoverishment of the population.

The richest republics, Croatia and Slovenia, which always felt they were supporting the poorest, were even more dissatisfied and wanted autonomy to deal with the crisis. This was due to the fact that Yugoslavia's economic production was aimed at the western market at the time, which favored Croatia and Slovenia. But this conjuncture harmed the poorer republics like Serbia and Montenegro that had an economy focused on agriculture and mining.

In this way, anti-federalist movements ended up gaining strength in the most developed republics. In the other republics, the appeal was for the recentralization of the government and the restructuring of the Yugoslav market. At that time, Kosovo, an autonomous province belonging to Serbia, began to show its aspirations for independence. The population, mostly Albanian, wanted to create an Albanian state independent of Yugoslavia. This Albanian state, later known as "Greater Albania" will gain considerable prominence in the Kosovo war in the late 1990s.

An example of this was the demonstration by Kosovar students at the University of Pristina in 1966. They demanded "political rights, recognition of republic status and participation in state development programmes. They justified their claims by remembering that they constituted a third of the total population of the Federation" (PADRÓS, 1999: 140).

Regarding Wallerstein's (1976) world system theory, Yugoslavia could be compared to the world system and was divided into centre, periphery and semi-periphery (SEVERO, 2011). The most developed republics such as Slovenia and Croatia were characterized as the center, which already had their economies fully turned to the West. Serbia and the autonomous province of Vojvodina were the semi-periphery. Macedonia, Montenegro and Bosnia-Herzegovina, the main suppliers of primary products, served as the periphery. Kosovo, a very poor province with a family farming economy, did not even enter this system.

In the midst of the economic recession, new agreements with the IMF had to be made in 1987. But this time, the aid was conditioned to clearly neoliberal measures and they were more rigid than the others. Due to the growing trade deficit there was no other way out for Prime Minister Branko Mikulić. The new reforms again brought negative consequences for the population such as new taxes, currency devaluation, salary cuts, increase in the price of oil, food and transport. The reform also brought greater political and economic centralization, which served to contain nationalist insurgencies.

In 1989, the then Prime Minister Ante Markovic abolished the system of self-management and all remnants of socialism, which led to the bankruptcy of half of Yugoslav companies. Due to the economic crisis and the collapse of communism in other countries, the government ended up losing its legitimacy, which increased the power of local elites, reinforcing nationalisms. In the next few years Yugoslavia saw its own demise. It should be noted that nationalisms and ethical issues contributed to the disintegration, but were not the only cause.

The attempt to eliminate socialism as quickly as possible had disastrous consequences for the country. The working population began to suffer from the lack of benefits that were guaranteed by the socialist model. Shock therapy, launched in 1990, had characteristics typical of countries in recession. Freezing and falling wages, very high inflation, rationing of domestic consumer goods were some of them. At the same time, Brazil was experiencing a similar recession.

Due to the economic crisis, the central government began to have difficulties in providing basic services. All the revenue obtained was turned to exports. In this way, the government ended up losing its legitimacy. This loss of legitimacy was also due to the collapse of communism in the neighboring Soviet republics. This situation made the local elites stronger and the aspirations for independence became more concrete.

Nationalist movements emerged in Croatia in the 1970s. But the Tito government responded strongly. He claimed that these movements were influenced by foreign powers more than dissatisfaction with reforms and nationalist sentiments (SEVERO, 2011). Furthermore, Hudson (2003) says that these groups wanted to weaken the self-management economy and devalue the role of workers.

According to Severo (2011), Croats and Slovenes were against centralization, as they claimed that the State restricted their economic interests. In addition, the less developed republics demanded a lot of resources and became a “burden” for the country as a whole. According to the author, this was the main reason for the separatism of Slovenia and Croatia. In 1989, the Slovenian constitution guaranteed the right of secession.

In the early 1990s, Serbs who supported centralization maneuvered to win more presidential votes than other republics. Each of them had one vote. But the regime of Slobodan Milosevic withdrew the autonomy and consequently the vote of the Serbian autonomous provinces (Kosovo and Vojvodina). Croatia and Slovenia were against this attitude. Furthermore, they accused Milosevic of extreme nationalism and of supporting the Serb minority in Croatia, which, according to unsubstantiated sources, wanted to form “Greater Serbia”. Slovenes came to support Kosovo 's independence .

In the 1990s, multi-party elections were held in republics. The federal elections, which were also planned, were vetoed by Slovenia on separatist grounds. Nationalist parties won in Croatia and Slovenia and socialist parties won in Serbia and Montenegro. Prime Minister Ante Markovic was in favor of the market economy, the federal model and multi-party democracy. In addition, he wanted to move closer to the European Union. But he received criticism from Serbia and Slovenia.

The Croatian leader elected was Franjo Tudjman . He was anti-Semitic and against Serbia. As soon as he came into power, he withdrew from public office and denationalized the Serbs residing in Croatia. As a result, relations with Serbs and other minorities turned violent. In this context, the Serb community of Krajina , which wanted to become an autonomous region, spoke out against Tudjman .

In 1991, after opening up the market, Slovenia, Croatia and Macedonia proclaimed their independence. This act triggered a serious crisis on the part of the central government and Serbia. There was armed confrontation in Slovenia that became known as the Ten Days War. This conflict pitted the central army, the JNA and the Slovenian army which acted through the Slovenian Territorial Defense. Slovenian troops managed to quickly stop the central army. Slovenia was already prepared for confrontation before independence with the formation of the Slovenian Guard and regional Militia Forces.

The JNA faced various difficulties throughout the wars. Like Yugoslavia, initially this army was made up of several ethnicities. However, during the conflicts many soldiers refused to fight against their own people. In addition, many refused to fight, as they did not want to be part of a communist army. This was formed by a Serb majority and later became an army of Serbs and began to act in their favor.

The Soviet Union did not support the disintegration of Yugoslavia because it also had breakaway regions. Thus, he intervened in the conflict only politically and not militarily. The ceasefire was made official by the Brioni Treaty on July 7, 1991 and was supported by the European Community. This agreement represented Slovenia's de facto independence.

In Croatia, on the other hand, there was an impasse in the self-proclaimed autonomous region of Krajina where the Serbian population wanted to continue belonging to Yugoslavia. But the Croatian population, which was the majority, refused the decision. There were armed clashes between Serbs and Croats and the JNA had to intervene in the region.

Croatia cut ties with Serbia shortly after its declaration of independence. This sparked a civil war between the Croatian militia and the Serb-Croats , which necessitated the intervention of the JNA. But the central army tended to support the Serb-Croats as it was mostly composed of Serb militants. Austria, Denmark, Hungary and Switzerland supported Croatian independence while the UK, France and the US and Russia supported the union of Yugoslavia.

The media supported Croatia's independence after the central army occupied the city of Dubrovnik , considered a historical and architectural heritage. Serbs were considered evil and Croats considered victims. The UN and the European Union tried to mediate the ceasefire. In September 1991, Milosevic and Tudjman signed a declaration and pledged to respect minorities and no longer use violence (SEVERO, 2011).

The UN Secretary General at the time, Pérez de Cuellar , considered the conflict to be an internal Yugoslavia issue. But the international community considered it a civil war. The final ceasefire agreement was signed in January 1992 and guaranteed Croatia's independence.

In Macedonia, tensions existed between Slavic Macedonians and Albanians. But the country achieved independence peacefully. The biggest difficulty was international recognition. Greece was its biggest obstacle. The reasons were the fear of a Macedonian advance towards Greece, in addition to the Macedonian flag which contained Greek symbols. They even decreed a trade embargo on Macedonia. With that, the country changed its flag as well as the name of the nation that came to be called the Former Yugoslav Republic of Macedonia.

In 1991, Bosnia's leader Izetbegovic proposed in parliament the country's separation from Yugoslavia. But the Bosnian Serbs rejected the proposal. Independence could only be accepted after consultation and acceptance of the three largest Bosnian communities – Bosnian Muslims, Bosnian Serbs and Bosnian Croats. Thus, in March 1992 a referendum was held to discuss independence. The Bosnian Serbs rejected it once again, as they wanted to remain in Yugoslavia. The result was 99% in favor of independence.

However, not the entire population participated in the referendum, which made it invalid. Even so, Bosnia and Herzegovina's independence was declared in March 1992 by government representative Izetbegovic. This attitude significantly increased tensions between the Bosnian, Serb and Croatian ethnic groups that formed the region. The European Union tried to make an agreement between the three ethnic groups, but it was not able to stop the conflict that took on catastrophic proportions.

The Lisbon Treaty of 1992 was an attempt to calm tempers between the three groups. It guaranteed equal rights and the right to self-determination to all groups. In addition, it divided the country into cantons based on ethnicity. But he did not address minority rights and structural issues of the state. This agreement could have avoided conflict, but it was not fully implemented. Representatives of Bosnian Muslims and Bosnian Serbs rejected the treaty shortly after signing.

The United States and the European Community recognized Bosnia's independence. The objective, for the USA, of this recognition was the strengthening of its area of influence in central Europe. At that time, the return of a united Yugoslavia became impossible.

In May, a violent armed conflict broke out. Bosnian Serbs attacked Bosnian Muslims. The Bosnian Serbs, with the help of the JNA, claimed and occupied several territories in Bosnia. However, according to Hudson (2003) these territories were historically occupied by Serbs. Muslim Bosnians tried to create a Muslim state by giving up Bosnian identity, as ethnicities could not come to an agreement. This further heightened tensions and pushed away the possibilities for a peace agreement.

The wave of violence prompted the UN to establish economic sanctions on Yugoslavia. But these sanctions, rather than discouraging Milosevic's support for the Bosnian Serbs, reinforced it further. As no one could understand the conflict, (civil war or international conflict) the international community was in doubt about who to support. The US, on the other hand, clearly supported Bosnian Muslims and Croats which helped to intensify the conflict with Bosnian Serbs.

The media portrayed the conflict as a Serbian attack on Bosnian Muslims. These were reported as the greatest casualties of the war. But Bosnian Muslims even attacked their own people only to blame the Bosnian Serbs and attract media attention. The discovery of concentration camps in Omarska worsened the image of Bosnian Serbs and shocked the international community. Concentration camps for Croats and Muslims also existed, but they were not reported in the press.

The US intervened in the conflict and NATO occupied the country. At the end of the war, in 1995, the Dayton Agreement was signed. Milosevic had to accept Bosnia's independence. From there, the country was formed by the Croatian Muslim Federation (51%) and the Bosnian-Serbian Republic (49%). The agreement guaranteed the legitimacy of sovereignty, but in practice Bosnia became an "international protectorate" in which the UN High Representative was responsible for the country's reconstruction.

Kosovar students took to the streets to demand independence. The Yugoslav government violently repressed the demonstrations and even declared a state of emergency. Many Serbs who inhabited Kosovo left the region. This episode heightened tensions between Kosovar Albanians and Serbs. In 1989 Kosovo's autonomous province status was revoked, which increased the desire for secession.

In 1992, the Democratic League of Kosovo led by Ibrahim Rugova declared the region's independence, but did not gain any international support. At the same time, the Kosovo Liberation Army (ELK) was formed. This armed force was secretly supported by the German secret service and the government of Albania and the United States. However, the group was not supported by the civilian population. The KLA has been classified as a terrorist group. Their actions caused many deaths of both Serbs and Kosovar Albanians accused of supporting the Serbian government (SEVERO, 2011).

In the late 1990s, the Albanian population in the region was much larger than the Serbian population. In addition, Kosovo received thousands of Albanians at that time, as Albania was facing a serious crisis. As tensions escalated, many Serbs had to leave the province. This huge demographic disparity contributed to the war in Kosovo. Serbia tried to soften this difference by sending Serbs to inhabit the region and creating a kind of "servility".

In 1998, the Kosovo Liberation Army intensified its military actions with the support of some Albanian elites. The violence practiced by the KLA and the desire to form "Greater Albania" provoked a violent Serbian reaction. With that, in 1998, the Serbian army invaded the region to try to destroy the KLA bases. Once again, ethnic cleansing was the instrument used by the Serbs, led by Milosevic, against the Albanian Kosovars. In the same year, the government of Serbia agreed to the presence of the European Organization for Security and Cooperation (OCSE).

The United States intervened in the Kosovo conflict as well as in Bosnia. This intervention resulted in the bombing of NATO. The Americans were not in favor of Milosevic's policy that did not allow Yugoslavia to enter the liberal system. Thus, behind the defense of the Albanian minority and human rights, the desire of the Americans was to eliminate the remnants of socialism that remained in central Europe and to consolidate capitalism. Thus, strategic interests dictated which parties states should support.

In 1999 there was the NATO air strike. The reasons for the bombing, according to NATO, were to weaken Milosevic, avoid ethnic cleansing and impose the Rambouillet Agreement (PADRÓS, 1999). By trying to weaken Milosevic with the attacks, NATO wore out politically, caused immense destruction in the province and made more than a million refugees. The Rambouillet Agreement was not fulfilled because it meant, in short, the end of sovereignty not only for Kosovo but also for the whole of Yugoslavia.

After months of bombing and much destruction, Milosevic gives in to Western pressure and withdraws his troops from Kosovar territory. After this period, the country was under the supervision of international organizations: the UN was responsible for the administration of the territory, the OCSE for legislative demands and for NATO security issues. In 2001 democratic elections took place with the victory of Rugova, leader of the Democratic League of Kosovo (LDK).

The prime minister of what was left of Yugoslavia (Serbia and Montenegro) was Zoran Djindjic. He denounced Milosevic at the International Criminal Tribunal for Yugoslavia. Milosevic was convicted of crimes against humanity in Kosovo and genocide in Bosnia. In 2006, Montenegro peacefully seceded from Serbia, ending the disintegration of Yugoslavia.

6 FINAL CONSIDERATIONS

The conflicts that led to the disintegration of Yugoslavia can be understood using multiple causalities (GADDIS, 2003). It is true that ethnic rivalries are included in these causes, but they were not the only ones. To consider only them is to restrict the events of an entire historical process. Thus, this historical process is approached by the trajectory of its statesmen, mainly Joseph Tito and also by Milosevic - but it can also be dealt with through deep forces (DUROSELLE, 2000). The deep forces included in the causal system influence, but do not determine, the actions of statesmen. These can be called "ideal types" because they have certain characteristics and peculiarities. Based on strategic calculations, they determine the path to be followed by a given State.

Yugoslav disintegration can also be explained by its forced insertion into the post- Cold War world system. This insertion added to a crisis of gigantic proportions brought chaos, destruction, an immense number of refugees and dead. In addition, the hesitation and omission of Western countries to intervene in the conflict also caused the clashes to reach that state. This hesitation is justified by the lack of understanding of the conflict: civil or international war.

The economic crisis, unemployment, misery, corruption of the bureaucratic elite served to encourage ethnic and national rivalries. Some Western countries such as states also contributed to the disintegration and even fostered rivalries. Its objectives were political, ideological and economic. With that, they aimed at the implantation of capitalism and the adoption of the neoliberal model. This meant access to market, labor and semiperipheral resources. Slovenia and Croatia, for example, offered market opportunities that interested the great powers. The other interest of these countries in the Balkan region was the payment of the external debt.

Yugoslavia suffered from the two world wars, was historically dominated by empires and was in the dispute between capitalist and socialist powers. After Tito's death there were no solid foundations to keep the country together and the result was its dissolution. It is impossible to say whether Yugoslavia would continue to exist post- Cold War. The fact is that war, the international system and capital, allied to ethnic and nationalist rivalries contributed to the end of this singular state.


Gradually, the former republics were adopting the paths of democracy. But its economic indices remain lower than those of other European states. Kosovo is still totally dependent on Western powers and its political independence is still being discussed . Animosities exist, characteristic of multi-ethnic societies with a recent bloody past. This can be explained by the rivalries between organized soccer fans in Croatia and Serbia. It is not a simple rivalry between clubs, but the affirmation of an identity. The dispute between these teams serves to show that the Yugoslav memory remains latent.

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CHAPTER 27

Approaches to the script genre: concept, characterization and pertinences

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ABSTRACT

Script is a text that indicates and systematizes basic information that will constitute a previously guided work. It is known, therefore, that this is a multifaceted discursive genre with relevance in various areas of human interaction, whether in science, arts, health or education. Thus, the objective of this manuscript is to discuss the origin of the screenplay; to cover its definitions and concepts that are attributed to it; to evidence characteristics intrinsic to the genre, as well as its structural aspects. Moreover, this is a study of

theoretical and conceptual nature carried out from documentary analysis, which focuses on the exploratory/bibliographical strand. It is evident, therefore, that the findings of this study corroborate the idea that the screenplay genre is understood as a kind of instructive guide that aims to aid the creative process of a given production, be it technical or artistic-literary. We conclude that, although surrounded by methodical and technical guidelines, this genre requires mastery of language, objectivity and simplicity for systemic achievement, in order to be enlightening, instructive and endowed with information that will serve as a basis in the construction of a kind of guiding map in a given human action.

Keywords: Script, Technical text, Writing, Audiovisual material.

1 INTRODUCTION

Scripting is a process that precedes several other steps that will subsidize the creation and development of a certain activity. This is because scripts are texts that adopt a certain archetype of presentation, carrying in their framework inevitable marks of style (ZORZO, 2020). Thus, it is evident that the purpose of a script is associated with the act of narrating a story, creating images and sounds through the text (ESTEVEES, 2018; FIELD, 1995). Based on this, it is essential to understand the guiding principles that attest to the origin, characteristics and usability of the script as an element that is part of the technical construction of socio-educational works and practices in various social activities, whether through a simple informative *folder*, or productions more elaborate such as films, animated infographics, plays, audiovisual projects, etc.

Under this conception, it is evident that the script, as it is associated with a human communicative activity, is characterized as a discursive genre, having, therefore, its own characteristics and specific outlines. For Bakhtin (2016), discursive genres are means that enable communication between subjects, in addition to the fact that they are endowed with specificities, such as: thematic content, specific structural compositions, their own styles. In this way, the script, within a communicative and dialogic perspective, admits particularities that characterize it as a systematic and organizational genre according to the needs of

those who use it.

In this context, a script indicates and systematizes basic information that will constitute a previously idealized work, that is, it elucidates characters, space, time, scenes and/or interviews, thus organizing the beginning, middle and end of a work, being, therefore, responsible for pointing out the fundamental structure of an activity under construction (MELO *et al.* , 2021). In addition, scripting acts as a compilation that synthesizes and gathers elements that will be put into practice during the execution of a work. Thus, this type of text can be understood as a step by step, that is, the organization of an initial idea that will gain tone in its purpose.

It is also noteworthy that it is understood as a secondary genre, because, unlike the primary genres that are simple and have their origin in the immediate discursive conditions, the secondary ones - and here the script is inserted - arise through conditions of a more complex cultural coexistence, developed and more organized (predominantly written) - artistic, scientific, sociopolitical, requiring creation technique (BAKHTIN, 2016). This converges with the condition that the script assume a standardized, instructional structure, which aims to guide the material realization of a project in stages that will be fulfilled for its realization (ARAUJO, 2014). With this understanding, it is known, therefore, that the script is a multifaceted discursive genre with relevance in several areas of human interaction, whether in the arts, sciences, education, among others, since scripting assumes the value of establishing a base of knowledge for what will be erected.

It is noticeable, therefore, that scriptwriting requires a keen eye and especially creativity about what you want to write, since it is in this phase that the central idea that will be developed is structured. There is, then, a mixture of different symbioses, whether through ideas derived from readings, music, texts, video, in short, visual media, etc. (KERSCH, MATIAS, 2018). Thus, the screenwriter needs to stimulate their perceptions so that the writing is cohesive, precise and attentive to the molds preceded by the genre. This action is given a detailed, technical, described-narrative and ordered character, which undergoes a metamorphosis between the beginning and the end of the creative process.

However, although the script is closely linked to several achievements in the social field and has a strong approach to the cinematographic world, it is still observed that there are rare studies that focus on this genre. This is certainly the case, because the script is rarely researched in isolation, due to the brevity occupied by this genre in the elaboration of a project, since, generally, the script is concentrated at the beginning of a work, and consequently, it becomes an object little analyzed (ESTEVEZ, 2018). From this perspective, it is pertinent to delve deeper into this theme, thus, it will be possible to understand more precisely about its properties still little explored, and in turn, fill the gaps associated with the aforementioned genre.

In this way, in order to understand beyond the surface of the theme, an analysis of the genre, here, pointed out, is carried out in this study. Therefore, this manuscript aims to discuss the origin of the script; encompass their definitions and concepts attributed to them; to highlight intrinsic characteristics of the

genre, structural aspects and usability. Furthermore, it is also intended to elucidate the relationship of this genre with the creation of audiovisual materials and the possible challenges faced in the process of elaboration of these.

2 METHODOLOGY

This manuscript is a study of a theoretical-conceptual nature based on documental analysis on the history, concept, characterizations and properties of the script genre, seeking to associate this investigated object with possible usability in the creation of audiovisual materials in the social sphere. In this way, this research focuses on the exploratory/bibliographic aspect, since it uses studies understood as bibliographic sources, that is, books, scientific articles and theoretical findings that corroborate and support the ordering and construction of hypotheses that direct this study (GIL, 2007).

3 RESULTS AND DISCUSSION

3.1 SCRIPT: ORIGIN, CONCEPT AND MULTITEXTUAL PERFORMANCE

Starting from the etymological conception, it is noted that the nature of the script is associated with the act of writing, since in its origin, the term “script” derives from the Latin *scriptum* and means writing (KICKHÖFEL, 2015). This innate characteristic - *writing* - allows this genre to dialogue with other areas, other genres and social performances. In fact, the script is conceived as a multiple arrangement of other intertexts, since, for its materialization, it is essential that so many other intertexts are also accessed for its creation, that is, it is the result of rereading and contact with previous works (CRUZ, 2016; GALVÃO, TIBURZIO, 2021).

It is worth remembering that, although its origin is closely linked to writing, it is in the world of arts, especially in the cinematographic context, that this genre gains notoriety. It is known that the screenplay has been used with greater emphasis in cinema, as the Seventh Art unquestionably prefigures a great narrative (written and spoken) of modernity. Therefore, scripting assumes a fundamental role in the gears that build ideas and desires, seeking, in turn, to bring the narrative character of life closer to real or fictional facts and events (CRUZ, 2016; PAIVA, GOMES, 2015).

It is noted that, despite the script being associated with other areas of knowledge, it is in cinema, that is, in the arts, that it finds more visibility. Certainly, scripting goes against so many other plastic, artistic and literary textual aspects. Given this multitextual scenario from which the script comes, its derivation and pre-existing symbiosis is salutary, thus generating the hypertext - the script (KICKHÖFEL, 2015). This, in turn, does not nullify its relationship between writing and audiovisual works, such as cinema, advertisements, informative *folders*, animated infographics, music, films, plays, etc., on the contrary, it further reinforces its plasticity and interaction capacity. with different socio-communicative means and social interactions in countless human actions.

In the face of such reality, this genre admits a textual character that allows it to find in writing the guiding thread to approach other dimensions, whether literary or technical. In fact, in order to achieve a cinematographic character, for example, the script needs to be centered on what the eye achieves, and its text must be subject to the condition of always describing something that is given to see (SOARES, 2009). This reaffirms the connection and interrelationship of this genre with the various social spheres, these actions being mediated by the exercise of prior writing of what man intends to constitute even before materializing his final purpose.

Therefore, through a hybrid construction, multiple textualities, languages, discourses, times, places of enunciation are intertwined (CRUZ, 2016; MORAN *et al.*, 2013). Given the dynamics of this genre, it is common for the “*script*” to emerge as the draft of what is desired for an educational, artistic, scientific activity, etc. Currently, due to the modernity and intensification of the internet and multisemiotic resources, it is not surprising that the script, before gaining *corpus* on a sheet of paper or on a computer screen, prefigures itself in audio notes or even in small notes on the *tablet* virtual notebooks *and smartphones*. In this context of multimodality, it is emphasized that:

As for multimodal resources, a documentary script can make use of tables, so that there is a better understanding of the organization of the film. Other formatting resources, such as indentations, the use of capital letters, bold or italics (as in titles, subtitles and scene transition marks) generally help in the later production process, as they allow a better visualization of the demarcation of the steps of the script. The use of symbols, sounds and images does not occur in the script text, but references are made to the multimodal resources to be used in the final product. (KERSCH, MATIAS, 2018, p. 136)

Due to the fact that the script circulates among the most varied social, cultural and technological performances, consequently the supports in which it can be found can vary continuously: ranging from a printed manuscript with restricted circulation or even to circulation in a virtual/digital environment, as files in different formats of digital media: document in *Word format*, audio, PDF, videos, etc. (KERSCH, MATIAS, 2018; MORAN *et al.*, 2013). All this dimension shows that the screenplay extends to different contexts around it and reaches different audiences and environments, which characterizes it as a genre adaptable to the needs and circumstances of the writer.

From this point of view, it is understandable that the creation of a script is established between the relationship of words (texts) and images, sounds, narratives and various influences from so many other types of knowledge that surround the process of designing a particular film material. So, it is not surprising that a script writer conducts his work based on the wide diversity of descriptive perspectives that transmute the wide creative freedom represented in a technical text (ZORZO, 2019; HAMPE, 1997). This encourages us to think of the script not only as a closed text in itself, but as a genre that goes far beyond the instructive and technical ideal (CRUZ, 2016; FIELD, 1995). In short, scriptwriting is a dynamic and also complex activity in which the screenwriter challenges himself from the beginning to create in a moment prior to the consolidation of a project that sums up his idea in an outcome that can be changed.

It is also added that, as a descriptive-narrative work, the script has no limits, and therefore, defining it or reducing it to a dialogic form becomes almost impossible. It is clear that it is different from a short story or a poem, however, it is also possible to converge similarities with such genres, that is, the boundaries between textual genres are fluctuating and change over time. Therefore, it becomes difficult to establish a fixed definition. (ESTEVEZ, 2018). So, it can be understood that the relationship of the script in the context of writing is guided by certain adaptable transitions through the scenario in which it is elaborated, since, in general, it appears in complex situations dominated by language, in particular, by writing. .

However, there are those who argue that, unlike a literary text, which allows a reading endowed with interpretations and freedom, in the script, this is less abstract and will depend on how the target audience for whom this genre is intended will interpret it (ZORZO , 2019; PUCCINI, 2009). It is in this context that the practice of scriptwriting is limited solely to the fact that it is a “guide text” lacking in literariness and imagination. This aspect is associated with a technical and practical load carried in itself, being, therefore, seen as a rigid and often restricted genre, objective, specific to a given context.

On the other hand, based on the language used in the aesthetic composition, the screenplay genre rises to micro-narratives that materialize in dramatic units, however, this will depend on the proposal to which a particular work will be inclined (KICKHÖFEL, 2015). That is why it is important to note that even being surrounded by technical characteristics, the script is free to be used in various activities, since this genre, still in its idealization, sounds like a synonym of planning to carry out something, be it an event, classes, movie , documentary, a trip, presentations and pedagogical creations, in short, scripting is also planning.

It is inferred, therefore, that regardless of the transposition of a given script to an audiovisual support, it must be written in advance, contain clear ideals, indications of scenes, dialogues (when necessary) and indication of space and time. Thus, this genre is transformed into reading material as legitimate as the product that will result from it (either a film, documentary, soap opera, *folder* , etc.) and should be treated as such (KICKHÖFEL, 2015; HAMPE, 1997). Therefore, it is understandable to see it as a multidimensional genre, although technical, it is endowed with particularities that go beyond mere involuntary technicality.

3.2 TYPES OF SCRIPTS: TECHNICAL AND LITERARY PERSPECTIVE

Recognizing a script is perhaps not a difficult task, as it has particular characteristics that make it evident among textual genres, such as its conciseness, objectivity, and above all, for serving as a kind of guide to create a particular project, idea or work, as already said before. However, it is necessary to consider that there is the possibility of treating this genre both in a technical way, as it is generally considered, but also from a literary perspective, that is, the screenplay genre assumes both a technical as well as a literary character. Commonly, scripting is part of a whole, that is, it is the initial text that contains the elements of

a larger work, tracing in it details that involve the production, serving as a compass for those who develop it. In this sense, it is observed that:

The technical script is the one that starts from the initial script to detail production aspects. That is, framing, scenarios, director's indications and various other information such as these are noted and computed in the technical script. It only serves so that the team can be in control of the production. This means that there is no narrative annotation in it other than those that were already there in the first script written. We conclude that every screenplay has two basic functions – narrative and technical. (ESTEVEES, 2018, p. 32)

From this conception, it is noted that the technical script is a segment of this genre that is responsible for indicating the indicative parts, that is, the descriptive structures according to the role of the agents who will perform the work, for example, director, technical team, scenery, lighting, etc.

Because it is closely associated with the technical part, the script appears as an attached text, but it is through it that a detailed path is traveled between the beginning, middle and end of a story (KERSCH, MATIAS, 2018; HAMPE, 1997). Furthermore, as a technical instrument, it is clear that this genre has textual possibilities exclusively for it that facilitate the realization of an idea (ESTEVEES, 2018; GALVÃO, TIBURZIO, 2021). Thus, one of its main inherent characteristics is: organizing the creative process from idea to execution, as it is essential for anyone who wants to create an audiovisual project.

From this technicist perspective, Cruz (2016) treats the script as an instructional manual, which, in the filmic way, expresses details, indicates scenes, scenarios, location and time, that is, in this type of text there is no interscene unity that interferes with the passage . of time, on the contrary, such an announcement happens intrascenically . This affects the understanding that “the script is a hard text, in general, little used to any poetic daydreams, and that aims at objectivity – otherwise, the production demands are obscured and it would lose its original foundation” (CAÚ , 2018, p. 9).

That said, these technical statements reaffirm that the script itself carries a definite importance in the execution of a given work that is previously planned under a technical nature (ESTEVEES, 2018; SARTORI, 2011). This is evidenced, for example, in the elaboration of a film, since, in technical-narrative scripts, in addition to telling something briefly about the story - who are the characters, characteristics of the plot, scenario, etc - in this type of text it is preferable the basic information of what is built. Under another dimension, it is important to point out that, although the script collides under the technical aegis, this genre is also seen as an artistic text, which is why some attribute the adjective “literary”. The script, as a literary emblem, manages to provide the reader with the ability to put himself in the place of the other (ZORZO, 2020). Therefore, it is important to think that:

The elevation of the status of simple “ pre -filming text” to artistic text instigates diverse opinions, including among the screenwriters themselves. We could start with the adjective that differentiates the literary script and the technical script. That is the first version of the text to be filmed, the screenwriter's primeval creation. It is called literary because it does not have much highly technical language, very close to literature. (ZORZO, 2019, p. 40)

From this look at the script, it is now possible to see it not only as a technical text, but as a genre coated with a certain literariness. This dialogues with the perception of Esteves (2018), that is, the script, in addition to the technical function, is also capable of narrativity, and these two functions are at the service of each other.

In this process, the literary script is considered to be the one that precedes the technical text, that is, it is a textual part exempt from descriptions of camera shots or each beginning of the scene, because in this concept of the script, the description of situational images is not subject to the plan requirements. Therefore, this type of script is responsible for creating a kind of mental construction about the image of what makes up the planned context, which is equivalent to an overview of the story to be assembled, also called a situation plan, since it appears before the detailing to the spectator (SOARES, 2009; PUCCINI, 2009). Thus, the literary script, unlike the technical text, is no longer singled out as a limited text, but surrounded by new meanings. Having said that, thinking about a script is also perceiving in a text beyond the closed form, but which makes possible an utterance endowed with possibilities. In this regard, it is interesting to think that:

In the written literary text, the reader enjoys ample freedom for different interpretations, while in the screenplay, freedom is guided by the screenwriter's intentions and a target audience that will participate in the transmutation of the written text into a film version. (ZORZO, 2019, p. 21)

Thus, although this genre is mostly a technical text, permeated by specific jargon and complex and for many limited scenic indications, it also admits suggestions from who writes it, that is, from the author/writer/screenwriter, who resorts to literary procedures constituted fundamentally by the written word, and for this reason, it also becomes an object of literary appreciation (OLIVEIRA, 2019). After all, “although the script is a work in itself, it is also part of a much larger one that will continue to be carried out after it is ready” (ESTEVES, 2018, p. 40). In short, scripting is a task that goes through technical, descriptive aspects, but can also reach narrative, subjective, that is, literary outlines. Thus, it is understood that elaborating a script is a work that happens in a way that is not so simplistic or merely reduced to an infallible formula. On the contrary, with regard to this activity, it is effective to remember that: “the work and the elaboration of the script happen in a complex way, as the theoretical and the fictional almost always occur concomitantly” (ZORZO, 2020).

In this clash that puts technical conditions on one side and intersubjective aspects on the other, it cannot be admitted that one stands out from the other, because, even if there are different perceptions, the purpose of such genre is to promote orientations and chains of ideas in the elaboration of a product. audio-visual. Thus, it is inferred that:

It doesn't mean that there are distinct types of scripts, but that there are procedural versions until they become a movie. As the first treatment is an “open” text for readings and modifications by the narrative instance so that it goes to the screens, there are several treatments between the script of the first treatment to the final script that goes to filming, which operate, similarly, by the tension creativity/ recreation. And, even after filming, changes, cuts and additions made in editing are necessary. (ZORZO, 2019, p. 32)

In short, “the script constitutes, then, the beginning of a visual process, and not the end of a literary process” (COMPARATO, 2018, p. 28). Therefore, although it is pertinent to distinguish and know the different existing types of script, the real meaning lies in knowing how each one can be used in favor of what one intends to create, be it a film, a documentary, a play, etc.

3.3 STRUCTURE, BASIC ELEMENTS OF THE SCREENPLAY, AND THE ROLE OF THE SCREENWRITER

As it is a textual-based genre, the script admits a structural configuration with basic elements for its writing. In this sense, if “scripting means cutting, selecting and structuring events within an order that will necessarily find its beginning and end”, as stated by Soares (2009, p. 21), in order to structure it, it is up to those who write to have basic knowledge about the type of appropriate language, as well as organizing the ideals around that genre.

In view of this, it is noteworthy that the writing of a script is usually based on phrasal topics, thus presenting not very long periods within the paragraphs. Added to this is the constant presence of a language more focused on objectivity, with clarity and conciseness, sometimes requiring the use of nominal phrases followed by an explanation or description. If it is necessary to use long or complex sentences, these correspond to the subtitles that may appear in the transcription or voice of certain characters or in the narration of speakers in the film version of a work (KERSCH, MATIAS, 2018). Furthermore, before writing a screenplay or structuring the steps that make up its textual interior, the screenwriter needs to have a definite idea about what he will project. This initial idea will be fundamental to create the arguments that will support the intended construction. In this sense, it is noted that:

Writing a screenplay is born out of a desire to edit. Within the scripting stages, the writing of a screenplay would be a moment prior to the writing of the script, a less detailed presentation of the film on paper. Being a necessary, but not obligatory, part of the screenwriter's activity, the argument will necessarily be within our field of research. (SOARES, 2009, p. 21)

It should be noted that the written or thought word is the nature of the genre under discussion. Whether it is put in a technical way or manifested under the literary character, the script is the balance of what is architected as a text/sign, being built for the decipherment carried out by those who will read and/or raise it as a work guide. That said, note that:

Writing a screenplay is much more than writing. In any case, it's writing in another way. With looks and silences, movements and immobility, with incredibly complex sets of images and sounds that can have a thousand relationships with each other, which can be clear or ambiguous, violent for some and soft for others. (COMPARATO, 2018, p. 28)

In this way, the script, whose nature is understood by focusing on the word put into art, is constructed as a text/sign, that is, it is configured through a signifier that offers itself to the decipherment carried out by the reading and development of the person who elaborates it (ZORZO, 2019; SARTORI, 2011). Certainly, this conception corroborates that structuring a screenplay is synonymous with adapting in the best way a certain external vision that a screenwriter has, thus converting it into a technical or literary framework that translates into a map that directs the creation process.

It is worth remembering that, in order to write a screenplay, it is not enough just to know the components that make up its textual structure, but it is very pertinent that whoever writes it – the screenwriter – feels prepared for such a job. For this, it is necessary “ideas, research, texts and fabrics that come and go until they build the whole that makes up the work” (ZORZO, 2020, p.15). Thus, a screenwriter, in addition to feeling intimate with the universe of writing, also needs to demonstrate a certain approximation with the audiovisual sphere, with the world of reading and with research. To know:

The screenwriter needs to have a basic intimacy with writing and cinematographic language. He needs to know how to write well and then study the format and steps needed to write a screenplay. It is a process that requires writing and rewriting, in addition to a lot of research to reach the essential elements at the beginning of filming. (ZORZO, 2019, p. 22)

Therefore, to act as a professional in this area is to face the constant restlessness of improving more and more the area of knowledge, because writing, rewriting, reading and research are indispensable in the elaboration of a good script. Thus, it is pertinent that the screenwriter has a useful knowledge of this genre, that is, in addition to the domain of formal writing, he also knows how to recognize and employ the basic domains that are established around the architectural structure of a screenplay, as well as properly employ the elements that composes it and singularizes the aforementioned genre.

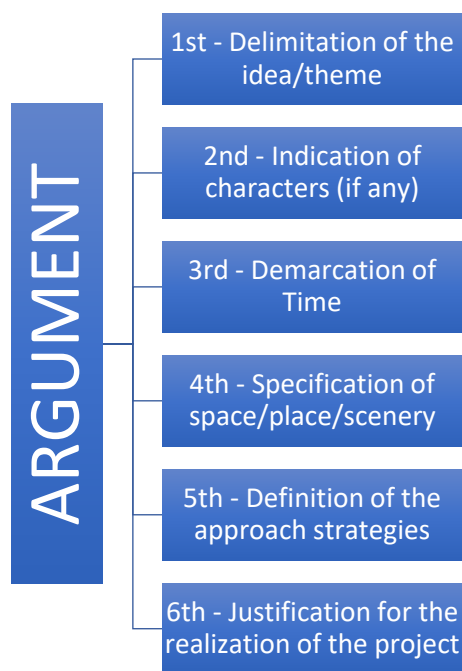
3.4 STAGES THAT CONSTITUTE THE CREATIVE PROCESS OF THE SCREENPLAY GENRE

It is already known that the script, by acting as a kind of guide, presents elements and steps that make it possible to instruct the chain of events that arise during the creative process. However, this task needs dexterity and determination, because writing a good screenplay, that is, telling a story with all the details and facets requires knowledge of technical details merged with the world of dramaturgy, literature and/or science in order to merge them into a linear construction that configures the text that will be converted into another even more materialized appearance (ASSIS, 2005; PAIVA, GOMES, 2015). For this procedure, it is pertinent to organize, assign meaning, in short, to build. In this context, it is wise to express that:

In a screenplay this means improving dialogue, synthesizing scenes, cutting others, eliminating exaggerations, coordinating plots, deepening characters, giving coherence to details. All done at the right time. The first treatment is the spontaneous version that presents, in a direct and immediate way, the most significant characteristics of the style. (ZORZO, 2019, p. 74)

Under this dimension, it is necessary to understand how the construction of a script occurs. This includes understanding what the steps are and the characteristics around them. Thus, through the pedagogical perspective of Melo *et al.* (2021), the relevant and basic steps of a script are explained below, these work as an exemplary and creative support for productions of the genre. In this way, after choosing a theme, subject, that is, a consistent master idea on which the project will unfold, it is also interesting to think about the motivating arguments for this idealization. This can be organized as shown in Figure 1:

Figure 1 - Steps for building a script argument



Source: Adapted from Melo *et al.* (2021)

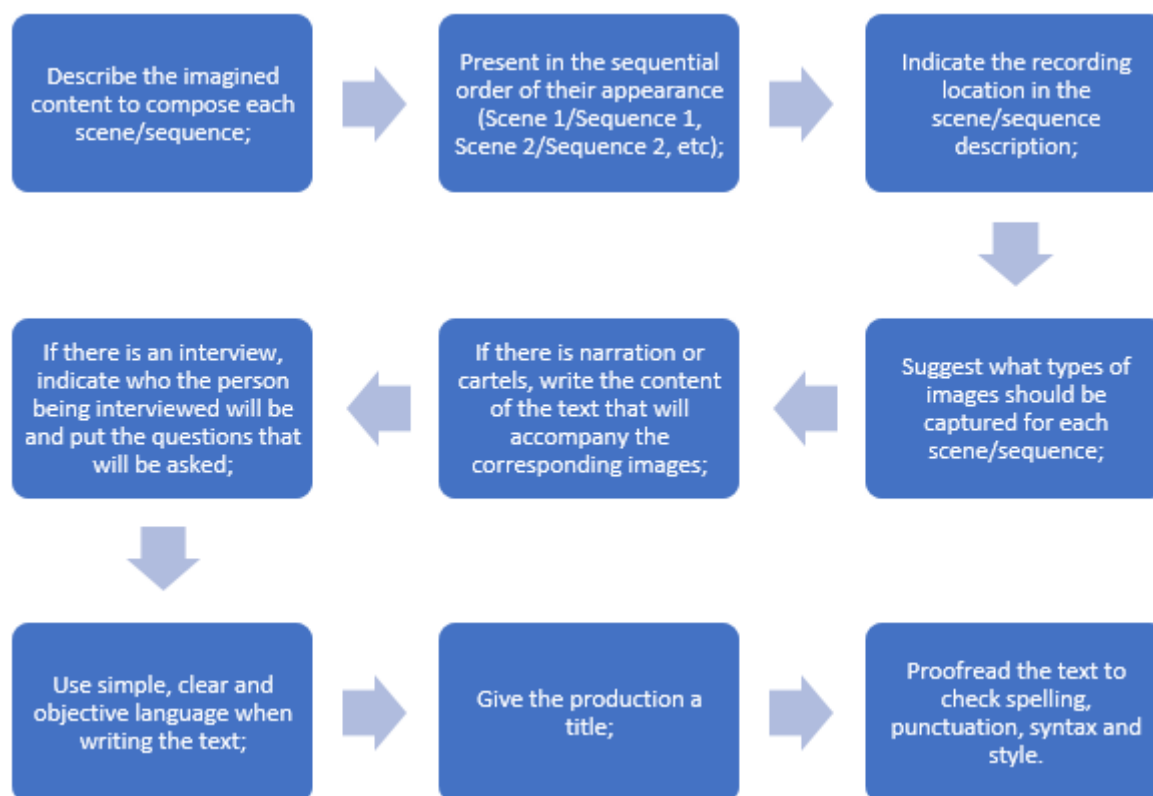
In view of the above scheme, shown in Figure 1, it can be deduced that, with the argument constituted, it is possible to formulate the synopsis of the work in development, that is, from the argued ideas, a summary is generated, a synthesis containing basically the elements addressed in the previous step.

Then, for the elaboration of the script, Melo *et al.* (2021) points out that it is important to think about the objectives that each scene and/or sequence of scenes will raise. In this way, it is recommended to think about the following guiding questions:

What will be the first image and sound of the film and why? What sensations, ideas and emotions can this image and sound provoke in the viewer? What will be the second image of the film? And the second sound? And how does this image and sound connect with the previous image and sound? And with the following? What meaning do they build together? Will there be interviews? Who will be the first interviewee and why this person and not another? What questions will be asked and what do we want to know from these questions? Will archival materials such as photographs, documents and home videos be used? For what purpose and at what times? Will there be music? Which one? What sensations can this song generate? Does it bring another layer of information/sense to what is being seen? Does it reinforce or oppose the image? How does the movie end? The image chosen to close the film leaves what impression on the viewer? Does it contribute to the point of view that the film intends to present? (Melo et al. 2021, p. 128)

Reflecting on these questions listed above helps the screenwriter to select what best suits his proposal, thus facilitating the construction of each sequence, whether in the opening, in the middle or at the end of the production for which it is intended. This is justified, because “for the screenwriter and director, with a good script in hand, it is easier to distinguish what can enrich and interest the narrative from what becomes dispersive” (ZORZO, 2020). Therefore, questioning oneself in advance of what should be elaborated certainly enriches and helps the selection of ideas and foundations around the synthesis produced. After the steps described, the script reaches the final structuring phase. At this point, it is interesting to have followed the guidelines already founded, because at this stage, it is expected, in fact, to build the guide material that will guide a certain audiovisual recording. That said, below is a diagram that makes it easier to understand the assembly of a script. Therefore, the following guidelines are followed, as detailed in Figure 2:

Figure 2 - Guidelines for writing a screenplay



Source: Adapted from Melo *et al.* (2021)

Due to the guidelines mentioned above in Figure 2, the script will go on to a textual treatment process, where it will be possible to polish the elements. Thus, it is expected that it will be “refined”, for that, and if necessary, it is guided: “improve the dialogues, synthesize scenes, cut others, eliminate exaggerations, coordinate the plots, deepen characters, give coherence to details” (ZORZO, 2020, p. 6). By accepting these suggestions, it is hoped, finally, to materialize in a fruitful way the creation of a material capable of meeting the needs foreseen at the beginning of a given project.

4 CONCLUSION

From the considerations discussed, it is evident that the script genre is defined as a kind of instructional guide that aims to assist the creative process of a given production, whether this is technical or artistic-literary, whether in the field of the arts or in technical-educational activities. and/or audiovisual. It is notable that, although surrounded by methodical and technical guidelines, this genre is also subject to the intersubjectivity of the person who writes it, since scripting arises from the act of writing, and this action – writing – is immersed in social relations, thus, derived from multiple information that instigate creativity.

It is also concluded that scripting is a way of systematizing an activity/work that we focus on. Therefore, it is necessary to master the language, objectivity, simplicity and lexical clarity to facilitate the understanding of what is produced, and thus promote the effective development of a project or activity. All of this culminates in a description, an informative map that will provide the necessary support in order to achieve the previously envisioned goals.

Therefore, scripting is a social, educational and systemic practice, which, if understood and methodologically followed by the individual who elaborates it, promotes the achievement of a certain instructive product rich in useful information to start a project in a less embarrassed and more enlightened way.

In short, it is understood that these reflections on the script subsidize more clearly the understanding of this genre. Furthermore, this study reinforces the idea that other research can also focus on this object in order to generate new concerns and understandings that expand and disseminate knowledge on this topic. Therefore, it is suggested to carry out original/primary studies, in an attempt that they can elucidate in more depth the definitions, characteristics and usability of the script genre associated with the creation of audiovisual materials in the most varied social segments.

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CHAPTER 27

Bioactive compounds and biological actions in edible flower species

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ABSTRACT

Introduction: Edible flowers are used in food in many regions, and over the years, their consumption has increased, as they add color and beauty to dishes, they also contribute to human health, as they are rich in bioactive compounds. **Objective:** Thus, the objective was to survey the literature on bioactive compounds from edible flowers, as well as expose some of biological activities. **Methodology:** A search for scientific research was carried out through electronic databases: SciElo, PubMed, Lilacs and Web of Science, using the descriptors: Flores comestíveis “Edible flowers”, Compostos bioativos “Bioactive

compounds” and Fitoquímicos “Phytochemicals”, combined by Boolean operator “AND”. We used studies available in full, in Portuguese or English, which contained two of the three descriptors. **Results:** Studies have shown that edible flowers have several bioactive compounds, highlighting the presence of flavonoids, anthocyanins, carotenoids, and phenolic acids that have biological actions (anti-inflammatory, antioxidant, anti-hyperglycemic, anti-obesity, antibacterial, for example). **Conclusion:** The physical-chemical and nutritional characterization studies have been growing, but there is still a lack of studies on native species in Brazil, to know their biological properties and encourage both the consumption and the production of edible flowers.

1 INTRODUCTION

Flowers are the structures responsible for plant reproduction, thus having characteristics such as color, aroma and appearance that are attractive to pollinators. Botanically, those that can form flowers and fruits, such as rose and mango, are classified as *angiosperms*. (FELIPPE, 2004).

To be considered complete flowers, they need to be formed by sepals, which are sterile leaves, usually green in color, which in turn form a set called calyx; Petals, which are sterile leaves, usually colorful and showy, and their set is called the corolla; Stamens are the male fertile leaves, responsible for the production of pollen, which together form the androecium; The carpels represent the fertile female leaves, forming the gynoecium. Each carpel has an ovary that contains the eggs and that, after each fertilization, will form the fruit; Finally, the stylet, a tubular part that has on its surface a structure called stigma, the place where pollen is received (IGLESIAS; CHAGAS; THOMAZ; (ORG), 2015).

Floraphagy is the act of ingesting flowers, a common habit in the diet of the population. Cauliflower (*Brassica oleracea var. botrytis*), artichoke (*Cynara cardunculus var. scolymus*) and broccoli (*Brassica oleracea var. italica*). Other flower species also frequently found are nasturtium (*Tropaeolum majus*), pansy (*Viola tricolor*) and roses (FERNANDES; CASAL; PEREIRA; SARAIVA *et al.*, 2016). Flowers make up the culinary culture in different regions of the planet. It is common to find them in recipes such as daylilies (*Hemerocallis disticha*) in China (JIAYI; JINYAN; JIER; XIAOQIN *et al.*, 2009), papaya flowers

(*Carica papaya*) in India (DEKA; NATH, 2021) , bougainvillea hybrids (*Bougainvillea hybrida*) in Thailand (KAISOON; SIRIAMORNUN; WEERAPREEYAKUL; MEESO, 2011) , pumpkin flowers (*Curcubita pepo*) in Mexico (SOTELO; LOPEZ-GARCÍA; BASURTO-PENÃ, 2007) ; and nasturtium (*Tropaeolum majus*) in Brazil (BARROS; ANDRADE; PEREIRA; DE OLIVEIRA *et al.* , 2020) .

The proper form of ingestion of each species of flower is different. Some species can be eaten whole, but in other cases, the consumption of certain parts is not recommended, such as roses and tulips, in which only the petals should be ingested (MLCEK; ROP, 2011) . The origin of the flowers is a determining factor for the safety of consumption, as it is explicitly recommended not to ingest flowers from florists, since they use fertilizers, herbicides and pesticides, which are harmful to our health and can cause poisoning. Thus, the purchase of flowers for consumption should only be from producers who adopt appropriate production methods (FERNANDES; CASAL; PEREIRA; SARAIVA *et al.* , 2016; LARA-CORTÉS; OSORIO-DÍAZ; JIMÉNEZ-APARICIO; BAUTISTA-BAÑOS, 2013) .

Edible flowers are widely used in gastronomy due to their relevance in the aesthetic composition of dishes, giving them surprising colors and shapes, in addition, they are elements that give different flavors and aromas. Its use varies between salads, jellies, desserts, drinks , oils and soups (FERNANDES; CASAL; PEREIRA; SARAIVA *et al.* , 2016) . Edible flowers have vitamins, minerals, proteins, amino acids and bioactive compounds that bring benefits to human health. They are mostly made up of water, characterizing themselves as a low-calorie option associated with the intake of the aforementioned nutrients. (LARA-CORTÉS; OSORIO-DÍAZ; JIMÉNEZ-APARICIO; BAUTISTA-BAÑOS, 2013) .

Bioactive compounds are the secondary metabolites of plants, responsible for their protection, coloring and attraction of pollinators and their levels vary according to each species, soil type, climate and flowering period (BORELLA; MARTINAZZO; AUMONDE; AMARANTE *et al.* , 2021; FERNANDES; CASAL; PEREIRA; SARAIVA *et al.* , 2016) . Among the secondary metabolites found are carotenoids and flavonoids which, in addition to being protective factors for plants, bring benefits to human health associated with their antioxidant function, which protects cells from oxidative damage , as well as anti-inflammatory and antitumor functions, correlated reducing the incidence of chronic non-communicable diseases (NCDs) and cardiovascular diseases (PEREIRA; CARDOSO, 2012) .

Given the above, the present study aimed to identify , through the review of specialized literature, the main edible flowers, their potential bioactive compounds and their possible biological actions.

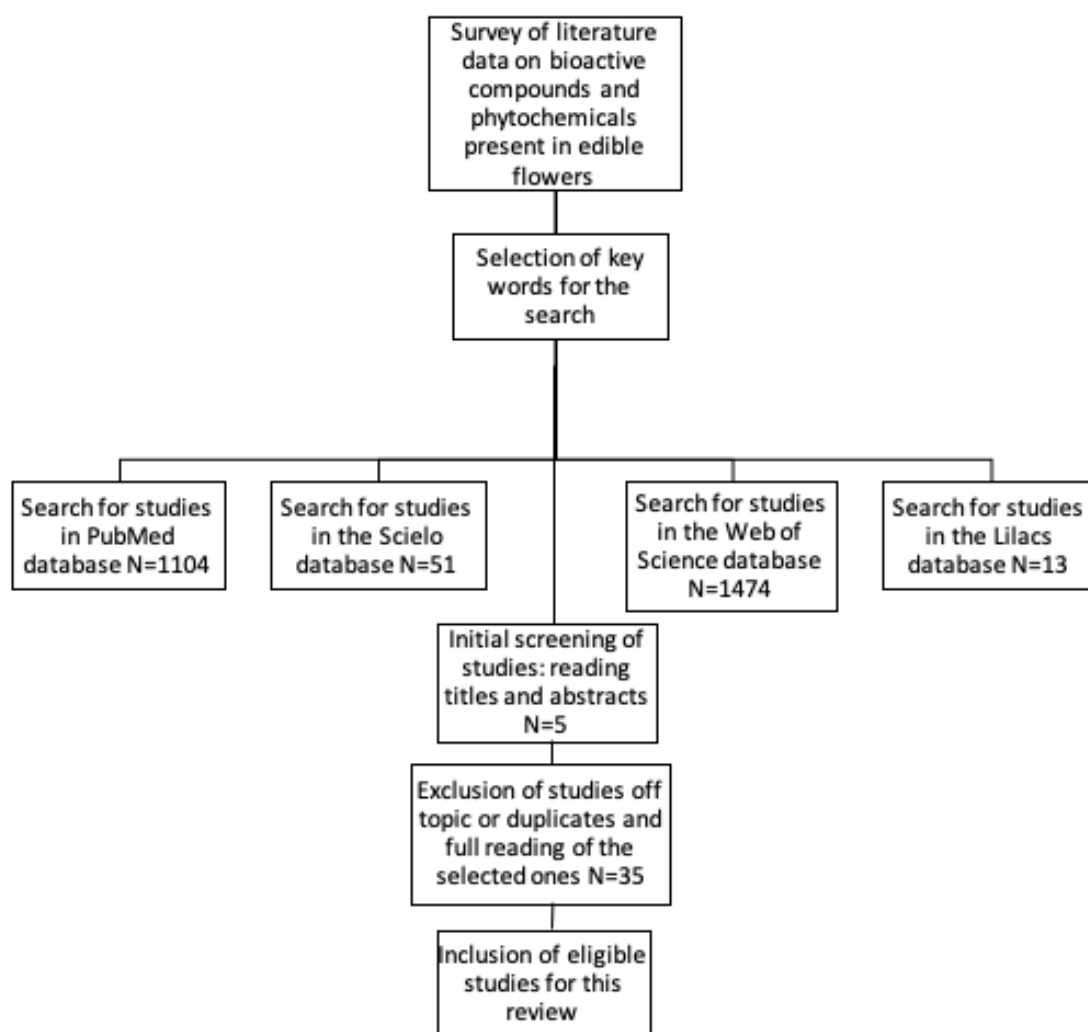
2 METHODS

This is a literature review, with a qualitative approach. Searches for scientific research were carried out through the electronic databases: Web of Science, Scielo, PubMed and Lilacs using descriptors: Edible flowers “edible flowers”, bioactive compounds “bioactive compounds” and phytochemicals “phytochemicals”, combined by the Boolean operator “AND”.

The inclusion criteria for the articles were: studies available in full, in Portuguese or English and containing two of the three descriptors. Studies that did not address the topic and that were not in the defined languages were excluded. Figure 1 was elaborated from the results found in each database, using the descriptors alone and in combination.

The selection of articles was made by reading the titles, and checking the two descriptors, in which 50 studies were pre-selected. Of these studies, which were duplicated, and 15 were excluded, leaving 35 studies to be read in full, and only 12 were elected to produce this work.

Figure 1: Study design



3 RESULTS AND DISCUSSION

Several studies with edible flowers in which phytochemical evaluations, physicochemical characterizations and antioxidant activity were performed are available in the literature. The most studied bioactive compounds were flavonoids, carotenoids and anthocyanins. It is observed that few of these studies were carried out in Brazil.

In table 1, we present the species of edible flowers, their main bioactive compounds and their respective biological activities. Among the most common activities, the antioxidant action stands out.

Table 1 . Edible flower species, their bioactive compounds and their respective biological activities.

Popular name	Botanical name	Bioactive compound	Activity biological	Reference
Perfect love	<i>viola x wittrockiana tricolor viola</i>	flavonoids anthocyanins carotenoids hydrolysable tannins	antioxidant anti-inflammatory anticancer antihyperglycemic anti-obesity cardioprotective antiviral antibacterial antifungal	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; FERNANDES; CASAL; PEREIRA; MALHEIRO <i>et al.</i> , 2019; FERNANDES; CASAL; PEREIRA; PEREIRA <i>et al.</i> , 2019; FERNANDES; RAMALHOSA; BAPTISTA; PEREIRA <i>et al.</i> , 2019; FERNANDES; RAMALHOSA; BAPTISTA; PEREIRA <i>et al.</i> , 2019; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009)
gladiolus flowers	<i>Gladiolus x grandiflorus</i>	anthocyanins flavonoids	antioxidant anti-obesity cardioprotective antibacterial antiviral antifungal	(JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009; SOUZA; JUNG; BENEDICTO; BOSCO, 2021)
false acacia rose	<i>Robinia hispida</i>	anthocyanins flavonoids	Antioxidant hypoglycemic anti-obesity cardioprotective antiviral antibacterial antifungal	(HALLMANN, 2020; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009)
bastard acacia	<i>Robinia pseudoacacia</i>	flavonoids	cardioprotective antioxidant antifungal antibacterial antiviral	(HALLMANN, 2020; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002)
pumpkin flower	<i>cucurbita maxima</i>	anthocyanin flavonoid carotenoid terpenoid	hypoglycemic antioxidant anti-inflammatory anti-obesity cardioprotective antiviral antibacterial antifungal	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; GHOSH; RANA, 2021; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
blue agave flower	<i>Salmian agave</i>	carotenoids flavonoids phenolic acids	antioxidant cardioprotective antiviral antibacterial antifungal	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; PINEDO-ESPINOZA; GUTIERREZ-TLAHQE; SANTIAGO-SAENZ; AGUIRRE-MANCILLA <i>et al.</i> , 2020)
aloe	<i>aloe vera</i>	carotenoids flavonoids phenolic acids	antioxidant cardioprotective antiviral antibacterial antifungal	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; PINEDO-ESPINOZA; GUTIERREZ-TLAHQE; SANTIAGO-SAENZ; AGUIRRE-MANCILLA <i>et al.</i> , 2020)
colorin	<i>American erythrina</i>	carotenoids flavonoids	antioxidant cardioprotective	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; JUCÁ;

		polyphenols	antiviral antibacterial antifungal anti-inflammatory antimicrobial	FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; PINEDO-ESPINOZA; GUTIERREZ-TLAHQUE; SANTIAGO-SAENZ; AGUIRRE-MANCILLA <i>et al.</i> , 2020)
blueberry cactus	<i>Myrtillocactus geometrizans</i>	carotenoids flavonoids phenolic acids	antioxidant cardioprotective antiviral antibacterial antifungal anti-inflammatory	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; PINEDO-ESPINOZA; GUTIERREZ-TLAHQUE; SANTIAGO-SAENZ; AGUIRRE-MANCILLA <i>et al.</i> , 2020)
guava tree	<i>acca sellowiana (O. Berg) Burret</i>	hydrolysable tannin anthocyanins flavonols flavonoids polyphenols	hypoglycemic antioxidant anti-obesity cardioprotective antiviral antibacterial antifungal	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; MAGRI; ADILETTA; PETRICCIONE, 2020; MONTORO; SERRELI; GIL; D'URSO <i>et al.</i> , 2020; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009)
Borage	<i>Borage officinalis</i>	flavonoids Anthocyanins Hydrolyzable Tannins	antioxidant hypoglycemic anti-obesity cardioprotective antibacterial antiviral antifungal	(FERNANDES; CASAL; PEREIRA; MALHEIRO <i>et al.</i> , 2019; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009)
Calendula (cowgirl weed)	<i>Calendula arvensis</i>	flavonoids anthocyanins hydrolysable tannins	hypoglycemic antioxidant anti-obesity cardioprotective antiviral antibacterial antifungal	(FERNANDES; CASAL; PEREIRA; MALHEIRO <i>et al.</i> , 2019; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009)
girl kiss	<i>Cosmos bipinnatus</i>	flavonoids anthocyanins hydrolysable tannins	hypoglycemic antioxidant Anti-inflammatory anti-obesity cardioprotective antibacterial antiviral antifungal	(FERNANDES; CASAL; PEREIRA; MALHEIRO <i>et al.</i> , 2019; JANG; PARK; PARK; PARK <i>et al.</i> , 2008; JUCÁ; FILHO; ALMEIDA; MESQUITA <i>et al.</i> , 2018; KRIS-ETHERTON; KEEN., 2002; NOWICKA ; WOJDYLO, 2019; PRIOR; WU, 2009)
elderberry	<i>Sambucus nigra</i>	phenolic acids flavonols polyphenols carotenoids triterpenoids	antioxidant cardioprotective anti-inflammatory antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Arnica	<i>Arnica L.</i>	Phenolic acids Flavonoids Polyphenoids Carotenoids Triterpenoids	Antioxidant Anti-inflammatory Cardioprotector Antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Chamomile-common	<i>Matricaria L.</i>	phenolic acids flavonols polyphenols carotenoids triterpenoids	antioxidant anti-inflammatory cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)

cornflower	<i>centaur cyanus L.</i>	anthocyanins phenolic acids flavonols polyphenols triterpenoids carotenoids	hypoglycemic antioxidant anti-inflammatory anti-obesity cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Daisy	<i>bellis perennis L.</i>	phenolic acid flavonols polyphenols carotenoids triterpenoids	antioxidant anti-inflammatory cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Calendula	<i>Calendula officinalis L.</i>	phenolic acids flavonols polyphenols carotenoids triterpenoids	antioxidant anti-inflammatory cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Acacia	<i>Acacia Mill.</i>	Phenolic acids Flavonoids polyphenoid carotenoids Triterpenoids	antioxidant anti-inflammatory cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
vulnerable	<i>Anthyllis vulneraria L.</i>	Phenolic acids Flavonoids Polyphenoids Carotenoids Triterpenoids	Anti-inflammatory Cardioprotector Antioxidant Antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Lavender	<i>Lavandula L.</i>	Anthocyanins Phenolic acids Flavonoids Polyphenous Triterpenoid Carotenoids	antihyperglycemic antioxidant anti-inflammatory anti-obesity cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
white nettle	<i>Lamium album L.</i>	anthocyanins phenolic acids flavonols polyphenols carotenoids triterpenoids	antihyperglycemic antioxidant anti-inflammatory anti-obesity cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009)
arboreal lavatera	<i>mallow arboreae L.</i>	anthocyanins phenolic acids flavonols polyphenols carotenoids triterpenoids	antihyperglycemic antioxidant anti-inflammatory anti-obesity cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Small leaf linden	<i>Tilia cordata Mill.</i>	phenolic acids flavonols polyphenols carotenoids triterpenoids	antioxidant anti-inflammatory cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
mallow	<i>Mallow L.</i>	anthocyanins phenolic acids flavonols polyphenols carotenoids triterpenoids	hypoglycemic antioxidant anti-inflammatory anti-obesity cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)

Primula	<i>Primula L.</i>	Phenolic acids Flavonoids Polyphenols Carotenoids Triterpenoids	Antioxidant Anti-inflammatory Cardioprotector Antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Spinheiro white	<i>Crataegus L.</i>	phenolic acids flavonols polyphenols carotenoids triterpenoids	antioxidant anti-inflammatory cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)
Mullein	<i>Mullein L.</i>	anthocyanins flavonols carotenoids triterpenoids polyphenols	hypoglycemic antioxidant anti-inflammatory anti-obesity cardioprotective antimicrobial	(BUNGAU; ABDEL-DAIM; TIT; GHANEM <i>et al.</i> , 2019; KRIS-ETHERTON; KEEN., 2002; NOWICKA; WOJDYLO, 2019; PRIOR; WU, 2009; RAJIC; AKIHISA; UKIYA; YASUKAWA <i>et al.</i> , 2001)

The Food Guide for the Brazilian Population recommends the practice of a diversified diet, composed mainly of *in natura foods* that provide the intake of nutrients such as vitamins, minerals and chemical compounds, substances that have been shown to be efficient for protecting and promoting health, compared to supplements or medications (BRASIL, 2014).

Compounds are secondary metabolites synthesized by plants, with the objective of attracting pollinators and protection, reducing damage caused by stress conditions such as heat, lack of water, excess ultraviolet radiation and infections by pathogens. They are widely found in edible flowers, the most common being flavonoids, anthocyanins, carotenoids and polyphenols, which provide health benefits because of their antioxidant, anti-inflammatory, anticancer and hypoglycemic effects, for example. However, the amount of flowers used by the population is small, either due to lack of knowledge and/or studies, difficulty in finding their own producers and keeping them in stock, or due to the short flowering period of the species (FERNANDES; CASAL; PEREIRA; PEREIRA *et al.* , 2019; KUMARI; UJALA; BHARGAVA, 2021; PINAKIN; KUMAR; SURI; SHARMA *et al.* , 2020) .

It is widely discussed in studies that a diet with antioxidants can prevent chronic diseases such as type II diabetes, cardiovascular disease and cancer, for example. The production of oxidant species during human metabolism is a natural process that plays an essential role in energy production, synthesizing compounds and signal transduction, however they can damage cells and lead to degenerative diseases. Thus, to avoid cell damage, the use of antioxidants is recommended, and edible flowers are a good source of them (LOIZZO; PUGLIESE; BONESI; TENUTA *et al.* , 2016; PRABAWATI; OKTAVIRINA; PALMA; SETYANINGSIH, 2021;) .

Flowers provide unique flavor sensations, increase the nutritional value of dishes and enhance gastronomic presentations. They can be eaten fresh, as is the case with marigold (*Calendula ofcinalis L.*), with a slightly bitter taste, and pumpkin flowers (*Cucurbita maxima*), which are slightly sweet. The pansies (*Viola x wittrockiana*) , aromatic with a sweet taste, are widely used in salads, endings of savory dishes,

soups, desserts and drinks. Also dried, in the form of infusions, such as cornflower flowers (*Centaurea cyanus L*) which has a spicy flavor similar to cloves; Molecular gastronomy also makes extensive use of flowers being crystallized in foam and isolated pigments (FERNANDES; CASAL; PEREIRA; SARAIVA *et al.* , 2016; TAKAHASHI; REZENDE; MOURA; DOMINGUETE *et al.* , 2020) .

A survey carried out in Portugal showed that sociodemographic characteristics influenced the consumption of edible flowers, with most participants who had already ingested flowers had higher schooling (GUINÉ; FLORENÇA; FERRÃO; CORREIA, 2019) . In Brazil the use of flowers is still restricted, in this way, knowledge about flowers can be disseminated in order to contribute to the preservation of plant species and their use as a food resource, in favor of the population. (TAKAHASHI; REZENDE; MOURA; DOMINGUETE *et al.* , 2020) . The fact that some flowers are still unexplored makes it necessary to develop studies to trace the profile of bioactive compounds, degree of toxicity associated with the amount of ingestion, the presence of allergenic and beneficial compounds to consumption, as well as factors that contribute to the preservation and identification of these plants. (PINAKIN; KUMAR; SURI; SHARMA *et al.* , 2020) .

4 FINAL CONSIDERATIONS

Considering the perspectives of using flowers in food found in the literature, it is concluded that their consumption can significantly contribute to the composition of menus.

The nutritional properties described in the present study showed that the consumption of flowers can bring health benefits, highlighting the presence of bioactive compounds, which have high antioxidant potential, making it possible to use them as a contributing factor for the prevention and treatment of non-communicable chronic diseases, for example.

Finally, we observe that there is an important deficit of studies on edible flowers in Brazil. In this way, the development of research with native flowers, in order to know and encourage the cultivation and consumption of these vegetables is extremely relevant and necessary with different objectives that contemplate important links of sustainability and nutrition.

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CHAPTER 28

Spectrum and net counts rates of ambient low energy (0.2-10.0) MeV gamma rays in São Jose dos Campos in Brazil region

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ABSTRACT

The measurement of the energy spectrum of environmental gamma radiation in the region of São José dos Campos, SP, Brazil, can indicate the radioactive chemical components existing in the land and air of this region. The portion of this radiation produced by primary and secondary cosmic rays are of

lower intensities and vary very little with respect to time on the Earth's surface. Winds and rains also vary the intensity of this gamma radiation near the earth's surface through the exhalation of radon gas. Using a gamma radiation spectrometer calibrated between the lower limit of 180 keV and the upper limit of 10.0 MeV, it was possible to determine these counts as a function of measurement time in this region.

Keywords: environmental gamma radiation, cosmic rays, radon gas.

1 INTRODUCTION

In the ground level of the Earth's surface, ambient ionizing gamma radiation is mainly composed with **ground telluric radiation** and primary and secondary cosmic ray radiation. However, it is difficult to separate over time the intensity of ionizing gamma radiation emanating from each component as the energies overlap. Telluric radiation is given by ^{238}U , ^{235}U , ^{40}K and ^{232}Th that is constant for each region [1]. **Radon gas** coming from the disintegration of ^{238}U on the earth's crust to ^{226}Ra and ^{222}Rn that arrives in the ^{214}Pb , ^{214}Po and ^{214}Bi isotopes, generating alpha and gamma radiation [2]. Primary cosmic radiation consists mainly of galactic and extragalactic protons and those from the Sun, all with high energy that interacts with the Earth's atmosphere producing Extensive Air Showers (EAS) [3]. Another possible source of ionizing radiation in the Earth's lower atmosphere are produced by lightning strikes between earth-clouds and clouds-earth[4]. The lightning cone forms X-rays, gamma rays, neutrons and beta particles [5]. Other sources of ionizing radiation are those produced in medical, dental and hospital clinics, but these are mainly controlled in small areas. Radon (^{222}Rn) are recognized as a major contributor to the dose due to natural radioactivity in the soil, being responsible for approximately half of all human exposure to ionizing radiation, [6]. Radon is a noble gas, emitting alpha particles, produced in the series of natural decay of uranium and thorium, which occur in varying concentrations in diverse geological materials, especially in rocks, soils and waters. Its diffusion and convection in the air occur at low altitudes (approximately <1000 m). Radon migrates from rocks and soils to the atmosphere through cracks, holes and pipes and it enters homes and other buildings. It is evident of oscillations in the emission of radon gas in periods of day and night with moderate doses of gas emission in days of intense rain and dry days with intense sunshine in the region [7]. Another important source of indoor radon gas is the construction materials. The progeny of

radon has received considerable attention in recent decades due to its potential causative effect of lung cancer if deposited in the upper respiratory tract when constantly inhaled, [7].

The rainfall intensity in (mm/min.) was measured with a pluviometer (bascule/bucket) rain gauge and data logger acquisition developed in ITA according to the international recommendations. Very few measures on the presence and variability of gas radon exist in Brazil, which makes it difficult to measure its intensity and factors that interfere with local health.

2 MATERIAL AND METHODS

The gamma ray detector used here for the 200 keV to 10.0 MeV energy range interval photons consists of a 3 inch high by 3 inch diameter Thallium doped NaI (Tl) scintillation crystal. This crystal directly coupled to a photomultiplier (PM) that records the pulses coming from the amplified scintillator and a digital analog converter with signals recorded by a computer laptop [8]. This experimental setup (Figure 1) is located in the inner room of a tower 25 m high relative to the ground (ACA Tower). The scintillator attached to the photomultiplier is wrapped in a thin layer of aluminum to make it portable. The set (scintillator + associated electronics + data acquisition) relies only on a laptop with a charged battery to measure radiation for up to 10 continuous hours. However, for long measurement series, electricity or photovoltaic power is used. The scintillator and associated electronics were calibrated in energy and intensity counts per minute in the ITA teaching experimental physics laboratory using radioactive sources and a 0.2 to 10.0 MeV spectral analyzer [9]. On the upper ceiling of the room shown at the top of the tower, a scale rain gauge was installed to measure the intensity of rainfall every minute. In that same room with open windows, an ionization chamber (see Figure 3) was installed to measure the intensity of radon gas at every hour[10,11].

Fig. 1: View of gamma scintillator with associated electronics and computer, (author).



Fig. 2 - Aerial and ground view of the tower ACA and his environmental field region in São José dos Campos, SP, Brazil (23° 12'45" S, 45° 52'00" W), (author).



3 RESULTS AND DISCUSSIONS

The spectrum of five measurements at different locations and dates is presented all close to the coordinates of (23° 12'45" S, 45° 52'00" W), sites already worked by man and without debris or rubbish with possible components, chemical or organic.

Figure 3 shows the measurements of the spectrum observed at an altitude of 25 meters and on the ground of the tower compared with the spectrum taken inside a house 1 km away from Earth surface in São José dos Campos.

Fig. 3 – Environmental spectrum measurements at ITA campus in one tower 25 meters high, and one house one kilometer next to the tower (author).

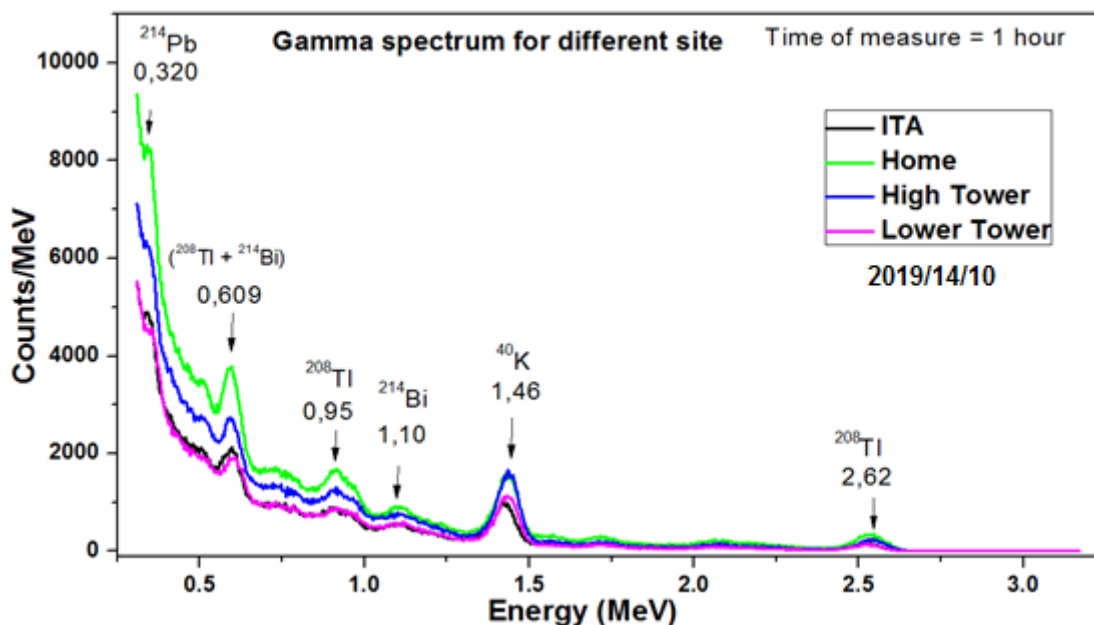


Figure 4 shows measurements of the gamma ray spectrum in April 2020 for 30

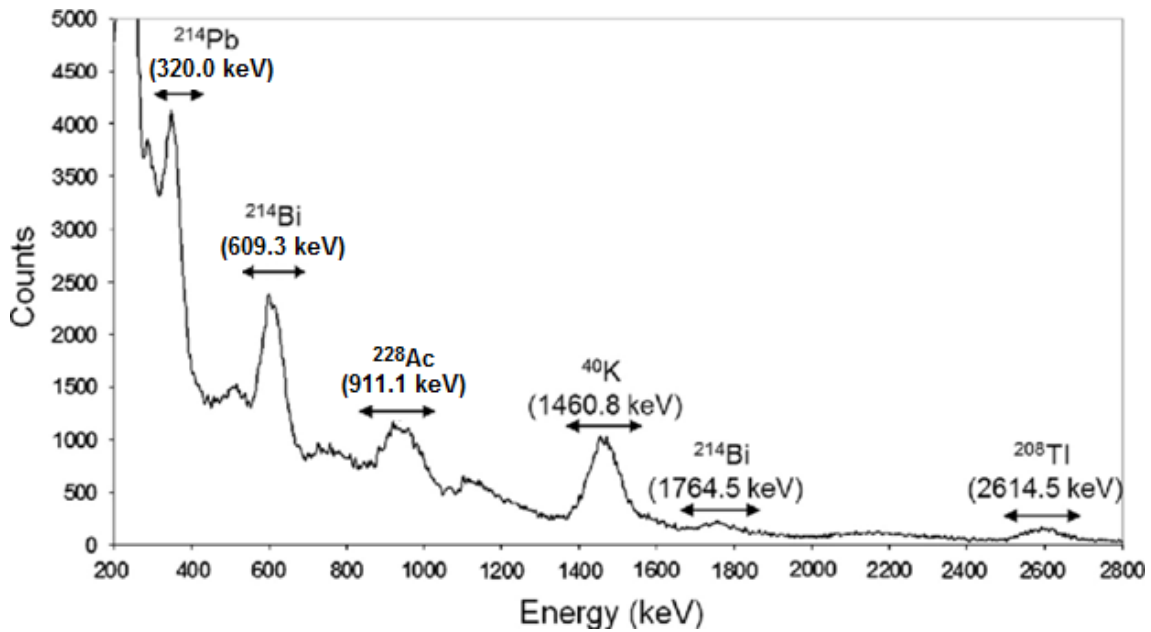
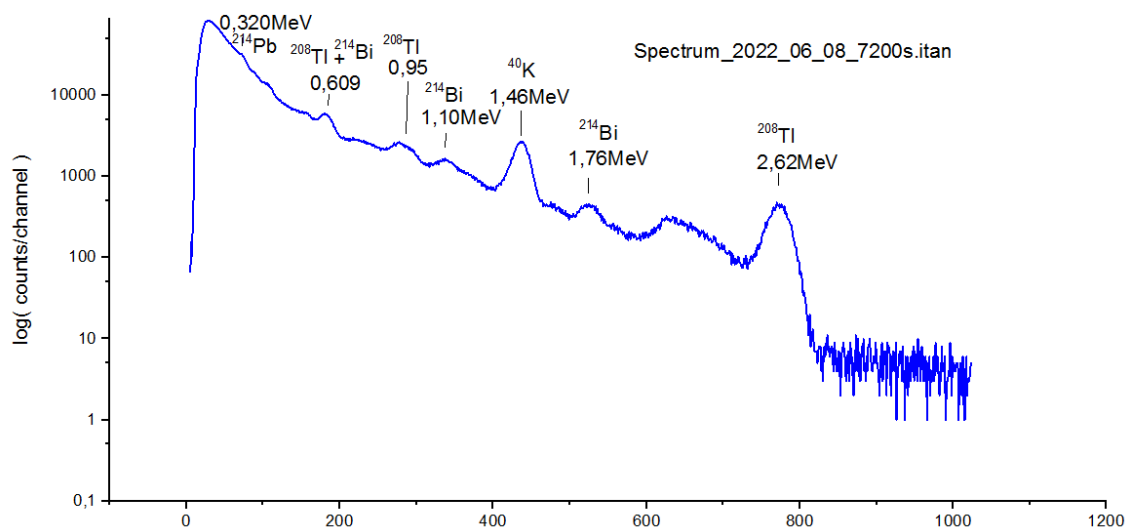


Fig. 4 – Spectrum measured at the ITA campus near the electromagnetism laboratory for experimental classes for second year students of the ITA, F46L course in April 2020 (author).

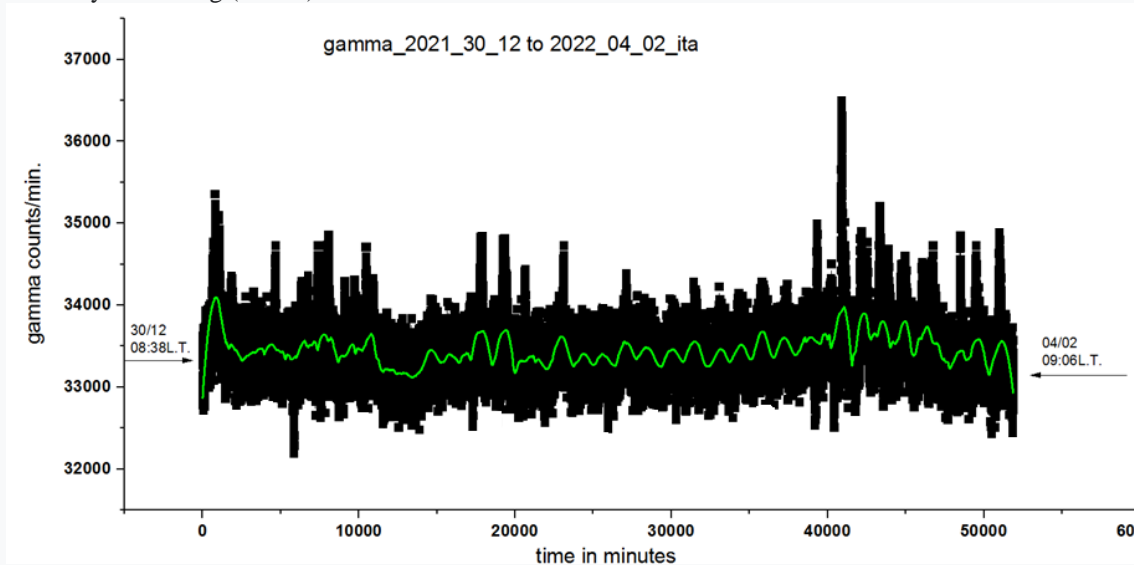
minutes in the electromagnetism laboratory in the old building of the Physics Department at ITA. In figure 5 the same spectrum is shown now with 2 hours of integrated time and in the

Fig. 5 – Measurement of the gamma ray spectrum performed in the new ITA building in the Physics Department, author's room on a logarithmic scale for 2 hours (author).



in the electromagnetism laboratory of the new building of the Physics Department at ITA. Figure 6 plots the measurements of the integral flux of 0.2-10 MeV every minute during December 30, 2021 to February 4, 2022.

Fig. 6 - Count of gamma radiation integrated every minute on the ITA campus from 12/30/2021 to 02/04/2022. The green line correspond one-day smoothing (author).



During the period from January 2014 to July 2022, around 50 spectra were performed in this energy range and in several locations on the ITA campus.

4 CONCLUSION

With this spectrometer with a supply of 600VDC from the NaI(Tl) scintillator and with a minimum of 10 minutes of measurements, it was possible to clearly observe the emission lines of the local surface: ^{208}Tl (2.62MeV), ^{214}Bi (1.76 MeV) , ^{40}K (1.46 MeV),

^{214}Bi (1,10MeV), ^{208}Tl (0.95MeV), [^{208}Tl + ^{214}Bi](0,609MeV) and ^{214}Pb (0,320 MeV). The resolution of these peaks improves as a function of longer measurement times.

In the case of counting per minute, variation in day/night gamma radiation, variation with the presence of rain and relative humidity can be seen. The presence of this local gamma radiation is sensitive to the emission of radon gas at the location and also due to the washing of this gas suspended in the lower cloud layers during heavy rains. These lines observed in the region are part of the decay of the nuclear series of the

^{232}Th , ^{40}K e ^{238}U from earth surface.

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CHAPTER 29

Risk prioritization methodology for decision makers

 [10.56238/pacfdnsv1-029](https://doi.org/10.56238/pacfdnsv1-029)

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ABSTRACT

Changes in regulatory standards, especially NR-01 with the obligation to prepare a Risk Management Program (RMP) has increased pressure on organizations to manage occupational risks. Companies need to establish mechanisms to protect the health and safety of their employees to meet legal obligations and reduce the damage caused to their employees and society. Organizations need to recognize the risks that make up their activities and establish measures to eliminate or reduce the potential damage that these risks can cause, and the proposed methodology seeks to solve this problem.

Keywords: Risk prioritization, Risk management, Decision making, Occupational hazards.

1 INTRODUCTION

Changes in regulatory standards, especially NR-01 with the obligation to prepare a Risk Management Program (RMP) has increased pressure on organizations to manage occupational risks. Companies need to establish mechanisms to protect the health and safety of their employees to meet legal obligations and reduce the damage caused to their employees and society. Organizations need to recognize the risks that make up their activities and establish measures to eliminate or reduce the potential damage that these risks can cause, and the proposed methodology seeks to solve this problem.

2 OBJECTIVE

The present work aims to present a system of recognition of occupational risks classified as physical, chemical, biological, ergonomic and accident risks, in order to establish criteria for prioritizing the evaluation of each agent of these risks, in order to enable better allocation of resources provided for the management of workers' health and safety.

3 METHODOLOGY

The methodology begins with the completion of checklists and questionnaires on the environmental risks inherent to each homogeneous exposure group (GHE). In this step, the qualitative aspects of each risk

agent will be raised, such as risk group, source generating the agent, time of exposure to the agent and health effects that they can cause. Once the qualitative assessment is completed, it is necessary to quantitatively evaluate each agent, this will be done with the attribution of the damage potential of each risk agent so that the degree of risk of these agents is observed, this degree is verified through a risk matrix, where the time of exposure to the agent and its potential for damage will be observed, so it can be classified as tolerable, moderate, substantial or intolerable. The methodology ends with the classification of the relevance of the sectors and the agents of risk observed, this will be done by observing the number of workers in each GHE and assigning values for each degree of risk.

4 RESULTS

The result of this methodology will be consolidated in a calculation where it will be possible to observe the contribution that each occupational agent and that each sector offers in terms of environmental risks. This system will help organizations to define specific programs to reduce work accidents and occupational diseases.

5 CONCLUSIONS

By carrying out the proposed methodology, organizations will be able to invest their resources in the sectors and risk agents that have the most impact and, with that, will be able to improve their performance in health and safety at work.

CHAPTER 30

Documentary review of strategic planning within Public Management

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ABSTRACT

OBJECTIVE: The main purpose of this research was to make a documentary review with the aim of making known the importance of a strategic plan within public management, since today carrying out such management requires many elements to become satisfactory. in all aspects. In other words, every company needs good organization and adequate control that can be achieved with a strategic management approach .

METHODOLOGY: The methodology used in this article has been under a quantitative approach, through the review of varied bibliography of national and international organizations as well as authors referring to the information previously investigated by them. **RESULTS:** As a result, it was evidenced that the use of the documentary review of strategic planning helps in public management by allowing plans, strategies and national policies to be carried out that are aimed at satisfying the needs presented by citizens. **CONCLUSION:** Finally, it is concluded that, at the international level, many companies, whether public or private, have presented a tendency to take into account strategic planning, since it favors their growth and development.

Keywords: Public Management, Strategic Planning, Company.

1 INTRODUCTION

Currently within the broad area of public management we find a systematic process called strategic approach, which is capable of developing and implementing previously detailed plans or projects, which provide execution facilities. All this with the objective or purpose set by the company, for which it requires the implementation of measures and training that allow the skills of the work team to be developed for a correct work development.

Public management is the body that manages a highly relevant company or state, seeking to provide and improve its services to people. That is why, within public management, the varieties of strategies and tools that are considered important for the effectiveness and efficiency of the services they offer are observed, improving the management and process of procedures, the use of technologies with the objective of carrying out the areas of work more effectively, and also improve the capabilities of employees through technology, improving the quality that is provided, so it is important to emphasize if public management had poor organization and/or administration, either for any of its different sectors, the effectiveness and efficiency of these would be dismal and there would be a delay with the objectives that the population expected (Machín et al., 2019) .

In addition, management in Latin America comes to be related as a changing state, due to the fact that over the centuries it has been adapting and evolving, obtaining new archetypes referring to the circumstances and environments, depending on the economic, political and social situation of the time (Valdéz, 2019).

Currently, public management is considered by the State as a process whose main purpose is to satisfy the deficiencies and illusions that citizens may present, all this through the establishment of more transparent and efficient tempering tools. In addition, this is a process that occurs gradually and only in governments that have previously established objectives, likewise, it is necessary to carry out a follow-up to ensure that it is being fulfilled in its entirety (Cepeda and Cifuentes, 2019) .

Public management is born as an alternative for governments that aspire to strengthen representative democracy, because it reflects that there is a great lack in the framework of acceptance by citizens; that is to say, governments are distrusted. In the same way, he mentions that public management in Latin America is important to apply due to its great benefits, which is defined as an agenda that involves changes in different areas of public management, which encompasses the various planning systems and management mechanisms (Pliscoff , 2017).

For Livari et al. (2020) indicates that technology in society must be encouraged by government powers, being them that promote through public management integrate and socialize within citizens, allowing them to know the development of the use of technologies in society; with the purpose of being able to improve the quality of life, which will be destined to offer more direct information to citizens.

In addition, Diaz (2017) mentions that it is important that in order to carry out public management it is necessary to take into consideration all citizens since they are part of public action and in the same way they can contribute to an improvement in management by incorporating them into all functions or administrative decisions so that they can have access and provide solutions so that they can work together.

Cohen (2017) points out that strategic planning is highly relevant within organizations, it has a fundamental role that provides status compared to others that lack it. In order to avoid a saturation of information within a company, tools are designed and coordinated that can provide opportunities and benefits, and in turn prevent future losses due to poor management.

Barreda (2016) comments that strategic planning is considered a systematic dynamic process of the points, both strong and weak, of an organization or system, in order to be clear about the threats and weaknesses that arise regarding the external environment. For which actions of a strategic nature are going to be formulated that will increase competition within the market and its fame within it, focusing on a more human praxis that allows demonstrating that this challenge is the responsibility of everyone in the organization. This process is divided as follows:

- Strategic management
- Strategic planning
- strategic plan

- Implementation of the control

Lopez and Pena(2016) consider that the competitive advantage has always been taken into account to carry out in organizations through a strategic plan determine the shortcomings and advantages to meet the objectives in a fast and results-oriented manner. The search for the objectives must occur avoiding high costs and putting first the recognition and comfort of the staff.

In addition, strategic planning is important and fundamental in all organizations, since it is an environment marked by uncertainty, and the constant changes in the market that makes the associations stay updated, establishing strategies to improve based on optimal results. (Robles et al., 2017).

On the other hand, it implies that planning is a process that is related to the implementation of a systematic plan, recognizes the importance of matching available resources with opportunities, and supports adaptation to a constantly changing environment, the "positioning" of the organization and its alignment with the realities of the environment (Thomas, 2020). Along the same lines, (Ojha et al., 2020) mention that the framework of a strategic plan is essential to be able to carry out an organizational plan to face problems and establish a action plan in order to solve and establish solution strategies.

2 METHODOLOGICAL STRATEGIES OR MATERIALS AND METHODS

This research was carried out with a quantitative approach, according to Guedes dos Santos et al. (2017), pointed out that a quantitative research is based on the elaboration of studies that are linked to numerical data, which encourage the conjunction of details and information in this way to corroborate theories and / or hypotheses

Along the same lines, Tobi and Kampen (2018) point out that this allowed the results to be numerically evidenced and the products to be quantified in statistical aspects, as well as to collect information in order to verify or corroborate the hypotheses and/or theories proposed.

Data collection techniques and instruments

Following the line of maintaining an effective and understandable approach for readers interested in the subject, it was decided to use a bibliographic review of authors relevant to the subject. This review consisted of an analysis of various sources, such as articles from indexed journals, among others, which were included taking into account the launch date and its relevance in the current historical context.

Reference sources

The record of information present in this research article was based on certain search engines, being mostly Redalyc, Scielo and Scopus, giving a total of twenty indexed journals, that is, in this one to reach the required information the search terms were the variables under study, "strategic planning" and "management" for proper research.

As for the reason why the sources of information were selected to be part of this research, it was based on space time, that is, only publications that were in the range from 2017 to the present were considered, in addition, it was made use of articles that were consistent with the study variables, which restricted a large number of investigations because their places of study were not related to the present. In addition, among the excluded publications are those that were not part of the determined range or those that did not come from reliable search engines or sources that lacked important data, reflecting doubtful origin for their inclusion.

PROCESS

Knowing the importance of strategic planning within public management, it is understood that it is recommended that any company or entity that participates within the administration has to appreciate and learn to make movements before the others.

This conclusion was reached after an investigation divided into three important steps: First, after raising the topic and the current problem, we continued to collect key and varied information to support the research work, in such a way that background and information were established. bases to clear the doubts around the variables. In the second instance, the results obtained from other authors could be contrasted, this with the aim of promoting and considering the relevant data skills of different search engines, years, and countries. Finally, the article responded to the objective and in turn will contribute to other investigations that have the same purpose.

3 RESULTS AND DISCUSSION

Results

Companies and organizations have chosen to implement strategic planning in their administration and management that allows them to increase the efficiency of their activities. However, this is not the case for many, since to implement this tool it is necessary to maintain a follow-up that evaluates the progress, problems and results that it can offer, which requires time and discipline.

Strategic planning, as mentioned by many authors, is a tool for improvement and damage anticipation that requires specific objectives, values and guidelines known by all its employees. This will allow the key factors in the methodological approach to be successful and the results to be observed not only in the long term, but also in the short term.

Due to the COVID-19 pandemic, various companies have had to resort to the implementation of more structured strategies, since before the arrival of the virus, companies were oriented to improve their services based on the increase in capital, however, currently, public management has had to innovate with planning strategies that allow taking care of the health of all employees, so that they have the confidence that the company cares about them, this being an important factor.

Discussion

Cavalcante (2018) refers that governments around the world have preferred to focus on continuous improvements in processes and services. They have also gotten better at developing management innovations that are increasingly gaining a strategic dimension in the public sector. Despite the variety of concepts, innovations in government are usually related to the progress of organizational processes and the implementation of procedures, services, policies or systems.

McBride et al. (2020) refer that for the implementation of strategic planning it is essential to take into account the support of citizens, so strategic planning aims to maximize the reach of public services to citizens, as well as improve national management and with this achieve a socio-productive country.

Veale and Brass (2019) refer that they seek to use new forms or implement new tools to provide better public services, the most significant reforms have been the strategic plans so that the efficiency of the government can be improved by improving the management and provision of public services for the continuous development of the country benefiting all citizens.

Melati et al. (2021) point out that the importance of a management is the information is based on the decision making of the public is directly related to the absence or scarce use of elements of knowledge management and intelligence in public management, in addition to analyzing the conditions and propose ways that lead to a higher quality in decision making and it was possible to contribute with intelligence in public management, as well as benefit the government with ways to be consolidated and better explored.

Gil et al. (2018) Among their results, they specified that innovation, transparency and data quality are essential elements to modernize the public sector and its administration. Moreover, to achieve efficient public management, it is a priority to propose access to information, in such a way that citizens can maintain an active participation, since this will achieve an equitable country where the population trusts the authorities and respects the rights. representation, individual rights, among others.

Along the same lines, under this new perspective, the population claims to be taken into consideration when public decisions are made; in other words, they want to assert their right to participate vigorously in public affairs. In the same way, it is pointed out that public management is fundamental for local development in Cuba since it is pointed out that attention is lacking in various areas such as the different strategies and programs that are executed in the country (Arias et al., 2018).

Therefore, according to Arundel et al. (2019) point out that public management is related to public sector innovation policies, so the innovation process is important, or how innovation occurs, in order to increase the use of innovation to solve problems and improve results in public management. Along the same lines, Lacovino et al. (2017) point out that the importance of taking into account public management is why they have been profoundly transformed, justified by the need to evolve and adapt to the social, economic and political contexts of the society .

Gomis (2017) points out that in relation to strategic planning it is important to implement policies, as well as to propose improvements in the Colombian capacity for intervention in the territory, where

digitization was an important factor so that citizens who lacked resources and who were away from the administrations can have the same powers as other citizens and in this way would help the development of public management.

Vargas (2020) mentions that the structure and culture of the new paradigm of a new public management is a constant concern of companies, since it has to do with the scope it has had throughout the population and what effects there are on the new governance. instrument of the State, so the authorities need to implement new strategies. In addition, it is pointed out that strategic planning has reduced by 60% the concern of carrying out adequate public management.

Papke et al. (2017) point out that the characteristics of the strategic planning of public management is through previous research, it is based on a planning of strategic information systems and strategic manufacturing planning, these two phases are a set of characteristics and innovative methods that are adopted to create a comprehensive model in favor of citizens.

4 CONCLUSION

As a first conclusion, it can be interpreted that the strategic approach provides benefits in the long and short term, since by preventing and warning of problematic situations , one is more aware and generates the realization of a good management of tools and skills for the satisfaction of the clients. involved. For this reason, its implementation in public services, both labor and educational, will generate considerable growth in the development of the country.

As a second conclusion, it is evident that many private and public companies have taken the step to implement new tools offered by technology. The purpose of this is for the company to be able to generate long-term profits after the correct use of transparent public management that provides the tools to meet the objectives that seek to generate greater benefits for the labor community.

As a final conclusion, it can be mentioned that, when comparing the satisfactory results obtained based on the documentary review, the implementation of a strategic plan within public management will bring satisfactory results where citizens will be the greatest beneficiaries. By being able to count on services that facilitate the procedures within each process that includes a petition to the State, and for this reason, it will improve the profitability and development of public entities, offering a better job for its employees.

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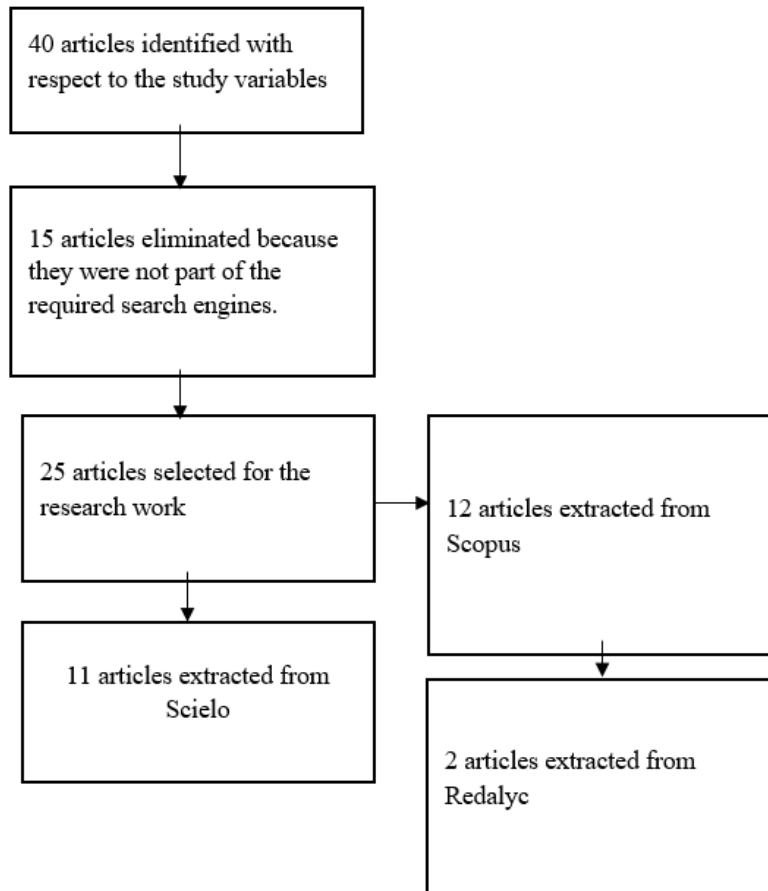
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PRISM DIAGRAM ANNEX


Figure 1: Prism diagram of the selection of articles and sources.



Source: Own elaboration.

CHAPTER 31

Higher order arithmetic sequences and applications

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ABSTRACT

In everyday life it is common to deal with some situations that involve the need to determine a general rule to describe them. To help in the description of phenomena that involve quantities that can be expressed in terms of polynomial functions, there is a need to find instruments that facilitate obtaining such polynomial functions from the data analyzed in the process. An easy way to obtain polynomial functions

from a sequence of real numbers is through the study of Higher Order Arithmetic Sequences. If the sequence obtained from the data collected through an experiment is polynomial, then this sequence is called an arithmetic sequence of order k , where k is the degree of the polynomial. With the study of higher order arithmetic sequences it is possible to obtain from a sequence of real numbers both the formula that describes this sequence and the formula for the sum of the first n terms of this sequence. With this, we will be able to obtain general formulas that allow us to obtain an estimate for the behavior of different phenomena. Thus, through the bibliographic survey, consulting the reference [1], the research project began with weekly meetings.

Keywords: Sequences, Polynomials, Pascal's Triangle, Newton's binomial, Functions.

1 INTRODUCTION

A higher-order arithmetic sequence is a sequence in which the formula that defines it is a polynomial function. In this way, we say that a sequence of order n is a polynomial function of degree n .

With the study of higher order arithmetic sequences, it is possible to obtain from a sequence of real numbers both the formula that describes the sequence and the formula for the sum of the first n terms of this sequence. Thus, we will be able to obtain general formulas that allow us to obtain an estimate for the behavior of different phenomena. For more information see [3].

Goals

The research objectives were aimed at:

- Introduce the concept of higher order arithmetic sequence;
- Find properties of higher order arithmetic sequences;
- Look for examples that illustrate and justify the study and application of higher-order arithmetic sequences.

2 METHODOLOGY

Initially, we sought to study various contents that served as prerequisites for the study of arithmetic sequences, such as arithmetic progressions, Pascal's triangle, Newton's binomial, among others. For this purpose, the reference [1] was basically used.

Through the introductory study, the need arose to study mathematical techniques of induction to obtain general results that were contemplated in the demonstrations of the main results. This was made possible by consulting [4].

Bibliographic research was necessary, we used, for example, [3], to obtain applications involving higher order arithmetic sequences through phenomena whose behavior can be translated through a polynomial function.

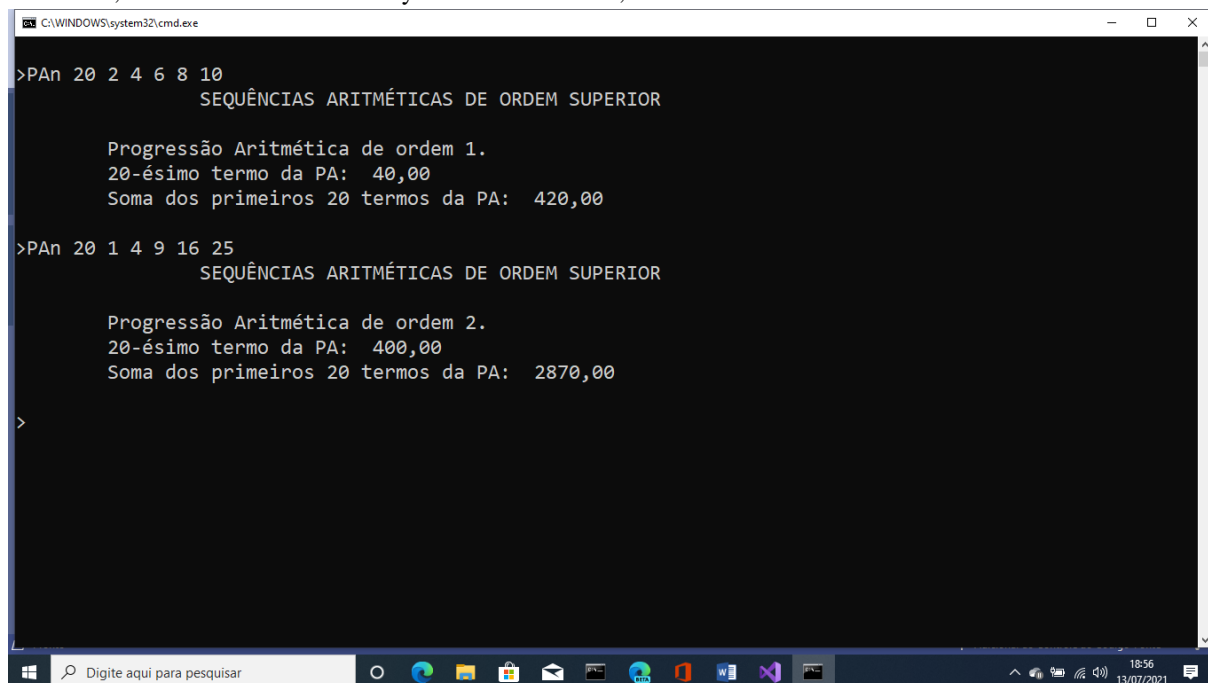
A study of programming in the C language using [2] was also necessary for the development of a software to integrate part of the knowledge about arithmetic progressions of higher order, and, to reach this end, we consulted [6]. A version of this program can be obtained in the appendix of this work. In figure 1 we have a screenshot of the program execution.

Figure 1 - Example of use of the developed program –

Caption: PA (arithmetical progression)

>PAn 20 2 4 6 8 10 - Higher order arithmetic sequences - Arithmetic progression of order 1 - 20th term of the Arithmetic Progression: 40,00 - Sum of the first twenty terms of PA: 420,00

>PAn 20 1 4 9 16 25 - Higher order arithmetic sequences - Arithmetic progression of order 2 - 20th term of the Arithmetic Progression: 400,00 - Sum of the first twenty terms of PA: 2870,00



```
CA:\WINDOWS\system32\cmd.exe
>PAn 20 2 4 6 8 10
      SEQUÊNCIAS ARITMÉTICAS DE ORDEM SUPERIOR

Progressão Aritmética de ordem 1.
20-ésimo termo da PA: 40,00
Soma dos primeiros 20 termos da PA: 420,00

>PAn 20 1 4 9 16 25
      SEQUÊNCIAS ARITMÉTICAS DE ORDEM SUPERIOR

Progressão Aritmética de ordem 2.
20-ésimo termo da PA: 400,00
Soma dos primeiros 20 termos da PA: 2870,00

>
```

3 RESULTS AND DISCUSSION

First, we created a special notation to designate each term in the difference table. In $a_n^{(c)}$, according to the table of differences, (c) indicates in which line the term is found and n indicates the position of the term in the indicated line. This has since been used to refer to sequence terms used in the context of the table of differences.

Soon after we define what we call the table of differences. This will be used to obtain from the sequence $(a_n^{(1)})$ the difference between its terms that will be taken as another sequence, $(a_n^{(2)})$, doing this for $k+1$ times to obtain the sequence $(a_n^{(k+1)})$. Thus, the term $a_n^{(c)}$ will be obtained recursively by equation (1).

$$a_n^{(c)} = a_{n+1}^{(c-1)} - a_n^{(c-1)} \quad (1)$$

Hence, a numerical sequence (a_n) is an arithmetic sequence of order k if the sequence $(a_n^{(k+1)})$ obtained from the difference table is constant for some non-zero constant.

Through discussions we arrived at the determination of a formula for the general term of an arithmetic sequence of order k . This is expressed according to equation (2).

$$a_n = \sum_{j=0}^k \binom{n-1}{j} a_1^{(j+1)} \quad (\text{two})$$

Using the properties seen in [1] and [5] we were able to demonstrate a formula that describes the behavior of the sum of the first n terms of an arithmetic sequence of order k . Equation 3 represents the sum formula.

$$S_n = \sum_{j=0}^k \binom{n}{j+1} a_1^{(j+1)} \quad (3)$$

To calculate the binomial coefficients present so far in equations (2) and (3) we use equation (4), and this equation is valid for all natural n .

$$\binom{n}{p} = \frac{n \cdot (n-1) \cdot (n-2) \cdot \dots \cdot (n-(p-1))}{p!} \quad (4)$$

After obtaining general formulas for a_n and S_n , we started to study cases that led us to a diversity of points that could be developed during the research.

We notice that the sum of any row of the table of differences, starting from the second, with the first element of the previous row results in the term $a_{n+1}^{(1)}$ as described in equation 5.

$$S_n^{(2)} + a_1^{(1)} = a_{n+1}^{(1)}$$

Having a sequence (a_1, a_2, \dots, a_n) as an arithmetic sequence of order k we can say that the inverse sequence $(a_m, a_{m-1}, \dots, a_1)$ is also an arithmetic sequence of the same order.

From what has been said, we can say that by permuting the n elements of any sequence, as long as it is an arithmetic sequence of order k , there is at least one more sequence that is an arithmetic sequence of order k . There may be more others of the same order or not. For this phenomenon, we could not establish general rules that explain this behavior. We just looked at a few examples.

To guarantee that from the table of differences a given sequence is an arithmetic sequence of order k we only need $k+1$ terms.

If more or less terms are used, the sequence may or may not be a higher-order arithmetic sequence with an order greater or less than k .

Finally, other properties and aspects of lesser relevance were also studied during the research. So the above can be seen as the most important.

4 CONCLUSIONS

In addition to the results that we already expected to obtain, which refer to the general term and the formula for the sum of the first n terms, we were able to obtain conclusions that show the existence of higher order arithmetic sequences and lead us to perceive their application in several problems.

Equations (2) and (3) were demonstrated by studying the properties described in [5] and by the induction techniques presented in [4]. Equation (2), the general term formula of a higher-order arithmetic sequence, can be used either to find any n term of the sequence or the polynomial that describes this sequence. Thus, a conclusion that could be obtained was that the polynomial has the same degree of the sequence it describes, that is, both have degree k .

When we refer to equation (3), the formula for the sum of the first n terms of an arithmetic sequence of higher order, we can conclude that the degree of the polynomial that generates it is a degree greater than that of the sequence, that is, the sequence has degree k and the sum polynomial has degree $k+1$.

We were unable to demonstrate and obtain general cases for some phenomena, which leaves room for other researchers to continue to develop this theme and establish rules and explanations for the behavior of these phenomena.

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Appendix

```
#include <stdio.h>
#include <stdlib.h>
#include <locale.h>

// This program must receive a list of numeric parameters (n, x, y, z, ..., w)
// where n is an integer and (x, y, z, ..., w) we have them from an AP,
// printing the Arithmetic Progression order, the nth term and the sum of the
// n first terms of Arithmetic Progression.

//Function that calculates a binomial number:
double binomial( int number1 , int number2 ) {
    if ( number2 > number1 ) return 0;
    else if ( numero2 == 1 ) return numero1;
    else if ( numero2 == 0 ) return 1;
    else if ( numero2 == numero1 ) return 1;
    else return binomio(numero1 - 1, numero2) + binomio(numero1 - 1, numero2 - 1);
}

//Function that calculates the elements of the difference table:
double seq( double * vector , int line , int column ) {
    if ( line == 0 ) return vector [ column ];
    else return seq( vector , row - 1, column + 1 ) - seq( vector , row - 1, column );
}

//Function that finds the Arithmetic Progression order:
int order( double * vector , int dim ) {
    int i;
    for ( i = 0; i < dim ; i++)
        if (seq( vector , dim - i, 0 ) != 0) break ;
    return dim - i;
}

//Function that calculates the nth term of an Arithmetic Progression:
double term( double * vector , int dim , int number ) {
    double x = 0;
    int i;
    for ( i = 0; i <= dim ; i++)
        x = x + binomial( number - 1, i ) * seq( vector , i, 0);
    return x;
}

// Function that determines the sum of the first k terms of an Arithmetic Progression:
double sum( double * vector , int dim , int number ) {
    double x = 0;
    int i;
    for ( i = 0; i <= dim ; i++)
        x = x + binomial( number , i + 1 ) * seq( vector , i, 0);
    return x;
}

//main program:
int main( int argc , char * argv [ ] ) {
    //Configuration of local Language and accent parameters:
    setlocale( LC_ALL , "Portuguese" );
    //For the program to continue, the user must enter at least two numbers as parameters:
    if ( argc > 2 ) {
        double * vector;
        int i;

        //Dynamic memory allocation for Arithmetic Progression2 terms:
        vector = ( double *)malloc(( argc -1 ) * sizeof ( double ));
        //Filling a vector with Arithmetic Progression terms:
        for ( i = 0; i < argc - 2; i++)
            vector[i] = atof( argv [ i + 2]);
        //Printing the results:
        i = atoi( argv [1]);
        printf( "\t\tHIGH ORDER ARITHMETIC SEQUENCES\n\n" );
        printf( "\tArithmetic Progression of order %d.\n" , order(vector, argc - 3));
        printf( "\t%d-th term of AP: %.2f\n" , i, term(vector, argc - 3, i));
        printf( "\tSum of first %d terms of AP: %.2f\n" , i, sum(vector, argc - 3, i));
        //Release dynamically allocated memory:
        free(vector);
    }
    else printf( "Enter at least two numeric parameters!\n" );
    return 0;
}
```

CHAPTER 32

Quantitative characterization of the housing of the elderly person mining from the 2013 PNAD

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ABSTRACT

The increase in life expectancy of the country's population reflects directly on its demographic structure, causing significant changes to occur in the various population strata, especially in the elderly population. Housing for this population is an

important factor, even because housing for the citizen is a physical and emotional need, that is, it is a fundamental question in your life. This article aims to present the housing characteristics experienced by the elderly population of Minas Gerais. To this end, we opted for a descriptive research with secondary data from the PNAD 2013 (IBGE). Both the extraction and the entire data processing and analysis process were performed using the statistical program *STATA – Data Analysis and Statistical Software, version 12.0*. It was concluded that the elderly population of Minas Gerais lives in their own houses made of masonry and covered with slabs or tiles, and they are served with basic sanitation and appliances, such as a stove and refrigerator.

Keywords: Elderly Person, Housing, Elderly Person from Minas Gerais.

1 INTRODUCTION

The increase in life expectancy of the country's population reflects directly on its demographic structure, causing significant changes to occur in the various population strata, especially in the elderly population. This fact intensifies the interest of scholars from different areas for the theme of aging and its consequences.

Aging is a phenomenon that all individuals go through, that is, it affects all social classes without distinction. The elderly person can be understood as the result of the junction of aging and old age (BERNIZ and BORGES, 2012; MONTEIRO, 2012). It is believed that aging, as it has been observed over time, can be considered a great triumph of humanity, after all, this was a desired condition. In the same perspective, this advance can be seen as the success of public policy investments in the lives of citizens. However, it brings with it important challenges within the scope of social policies that should fully meet fundamental rights and the dignity of the citizen (BERNIZ and BORGES, 2012).

Brazil is inserted in the scenario of population aging, with the Southeast region being the most prominent in this context. The Brazilian Southeast is the region that concentrates the largest population volume in the country, and has the highest percentage of elderly people in relation to other regions. In 2000, the percentage of elderly people was 9.3%, while the country average was 8.6%. The State of Minas Gerais

is the third with the highest rate of elderly people in the Southeast region, losing only to the States of Rio de Janeiro and São Paulo, in this sequence (CAMARANO, 2010).

The Minas Gerais population also exhibits the demographic changes observed in the country. In 2000, the population was around 18 million, while in 1950 it was 7.7 million. Thus, the population more than doubled in 50 years (CAMARANO, 2010).

Starting from the premise that the individual begins to age as soon as he is born, aging should be highlighted as a dynamic process throughout life, which can be successful through active actions and processes throughout life. The habitat of the elderly person favors or not this process.

Considering that the house is the extension of the individual's life, the living of this population segment requires special attention in relation to the changes that appear with advancing age, such as decreased motor coordination, visual and hearing acuity and emotional losses.

The Brazilian reality regarding the housing issue is quite complex, the result of a combination of factors such as the difficulty of access to formal work, the disorderly occupation of urban land, the pressure of the real estate market, the lack of regulation of this market by well-established governments. such as the application and enforcement of existing legislation. Data show that about 50% of the population lives irregularly or illegally in irregular or clandestine subdivisions in tenements and favelas. This population is not served by satisfactory urban infrastructure and equipment, thus suggesting a housing deficit (GENOVOIS, 2001).

In this perspective, Braga (2001) states that this problem directly affects the life of the elderly. Aging with dignity requires favorable conditions in all aspects, including the social, emotional and physical, all guided by legislation and not expropriating this individual to citizenship, since the fact that a person grows old does not change his rights as a Brazilian citizen.

It is also worth emphasizing that housing for citizens is a physical and emotional need, that is, it is a fundamental question in your life. By experiencing unfavorable socioeconomic conditions, the less favored population does not appear in society as citizens with rights. It is in this sense that the low-income Brazilian elderly population is subjected to a situation of social risk, due to the difficulty of accessing adequate housing, health, leisure, among other rights that are guaranteed by law, but little implemented in practice (CAMARANO, 2010).

The proposal of the World Health Organization (WHO) that refers to active aging mentions that the elderly individual needs to enjoy effective actions that guarantee health, community/social participation and safety (MONTEIRO, 2012). In this way, policies aimed at this portion of the population are fundamental and housing is an important component in guaranteeing this tripod.

Considering this point of view, regarding Brazilian aging and housing for the elderly, it can be inferred that, researching the profile of this population and the way in which this population segment inhabits, are configured in a contemporary and pertinent reflection, in the sense of focus on this population

that grows significantly in Brazil, and of course, in the State of Minas Gerais as well, a growth that reflects in all organisms of society.

This article is the result of a master's thesis, by the Federal University of Viçosa, which characterized the elderly and their living in the State of Minas Gerais. Housing for the elderly can be seen as an important parameter of well-being and quality of life. Thus, this article deals with housing for the elderly in the State of Minas Gerais.

2 METHODOLOGY

Research characterization:

To understand the elderly person-housing relationship, a descriptive approach was used, which best outlines, organizes and summarizes the set of observed characteristics.

According to Gil (2010), descriptive research is based on explaining the characteristics of the object, which is in line with the purpose of this research. To meet the descriptive approach, quantitative methods were used, with secondary data from the PNAD – National Household Sample Survey 2013.

Sample Description:

We chose to use the 2013 data because they are the most up-to-date information and because they were available during the period in which this article was being prepared.

In principle, the information obtained from the PNAD database consisted of the file of people and households distributed throughout the national territory. However, depending on the nature of the work, a cut was made, delimiting the households established in the State of Minas Gerais in which at least one person aged over 60 years lived. So that the data could support the understanding of the objectives of the study and starting from the premise that a young elderly person may have different characteristics from the oldest elderly, the ages were sectioned. Thus, the contingent of elderly people, defined in Brazil as individuals aged 60 and over, was subdivided by age into three groups

It is noteworthy that the PNAD comprises a representative sample of the population. However, in the present research, we used the specific command *fweight = weight_pes*, in order to expand the results to the entire population.

Method of data analysis:

Both the extraction and the entire data processing and analysis process were performed using the statistical program *STATA – Data Analysis and Statistical Software, version 12.0*, licensed by the Federal University of Viçosa – UFV, with production of tables and graphs, generating a synthesis for better visualization of the variables used in this study.

3 RESULTS AND DISCUSSIONS

The population in the state of Minas Gerais, in 2013, consisted of 20,627,585 people, of which 10,053,140 were men and 10,574,445 were women, which corresponds to 48.74% men and 51.26% of women. The elderly population, on the other hand, was equivalent to 13% of the total population and was composed of 2,796,421 individuals, of which 1,243,801 were men, 44.48%, and 1,552,620 were women, 55.52%.

Most elderly people live in urban areas, 2,269,749 (81.17%) to the detriment of 526,673 (18.83%) living in rural areas. However, their distribution by sex is different. In urban areas, there are more elderly women, 1,299,809 (57.27%), which can be understood by the fact that living conditions are supposedly easier in the city, especially for elderly women who often live alone. In rural areas, there is a higher incidence of elderly men 273,862 (52%).

In relation to race, a balanced value of the white and non-white population was verified, that is, there is a difference of only 1.58 percentages more of white elderly people, however, the differences become more expressive when the analysis is carried out back to age groups. In the group of elderly people over 80 years of age, the category of white color is more frequent, 59.49%, compared to 40.51% of non-whites. Among the youngest, in the group of people between 60 and 69 years old, 48.09% are white compared to 51.97% of non-white people.

In terms of education, it was found that the training of most elderly people is limited to elementary school (78.22% did not go beyond elementary or elementary school). This data allows us to infer that our elderly people are poorly educated. Even with teaching incentives aimed at the elderly, such as adult education and university for the elderly, while 12.07% completed high school, only 9.28% are graduates and 0.43% obtained a degree in some postgraduate .

It is clear, according to Morais (2002), that access to adequate housing and urban infrastructure services promote social inclusion and can fight poverty. One of the reasons housing is considered a basic need and a citizen's right. "Housing is a meritorious good, which presents high positive externalities in terms of social well-being" (MORAIS, 2002 , p.110).

Regarding the type of household where the elderly person resides, the house was the highest occurrence when analyzing people over 60 years of age in Minas Gerais. The majority live at home, 89.70%, and 10.12% in apartments. However, when evaluating the three groups divided by age, it was noticed that the older the person, the lower the demand for living at home. In Group 01, 90.04% were observed; and 89.34%; and 87.88% for Group 02 and 03, respectively, lived at home. It can be inferred, then, that, throughout life, the elderly person tends to move to apartments, motivated by the fact that they become dependent on younger people who access this housing typology more frequently. Many need care from family members, who are the first point of support for the elderly individual.

Of the 2,082,553 households, 87.36% were owned and, in 8.12%, the occupancy condition was in rented properties. This statement is also observed in the different groups studied. In Group 01, 86.67%, and

in Group 02, 87.87% lived in their own homes, while in Group 03, 95.29%. One hypothesis for this situation is that the older the elderly person, over the years, the more financial resources he accumulates, enabling him to buy his own home. This is associated with the fact that owning the property in which one lives is a desire rooted in Brazilian culture. As Mirela Camargos , a researcher at the FJP puts it, this property condition differs from other Minas Gerais inhabitants. While 84.90% of individuals over 60 years old lived in their own homes, only 65.30% are owners when analyzing the group from 15 to 59 years old.

It was found that most homes that had at least one resident elderly person had a bathroom, 99.22% of the total. This pattern was maintained in the three groups. The presence of a bathroom at home represents an improvement in the hygiene, comfort and health conditions of the family. The bathroom in the house is one of the necessary requirements for habitability ¹in the house (BARTH *et al* , 2009; MASSENA, 2002; MIRANDA, 2005).

As for the number of rooms per dwelling, the pattern observed was 2 and 3-bedroom dwellings, that is, comprising dwellings with 4 to 6 rooms and 7 to 9 rooms. The highest incidence was in households with 4 to 6 rooms, 48.98%, and those with 7 to 9 rooms, 38.52%. This distribution occurred both in Group 01, with 47.56%, and in Group 02, with 47.59%; because they lived in a house with 4 to 6 rooms; group 03, 49.94%, lived in properties with 7 to 9 rooms. It can be inferred that the elderly start to be included in the Extended Family or in the Compound Household due to issues related to the dependence of the elderly person, physical care and assistance in day-to-day activities, such as managing their income or even caring for the elderly. of the House. This implies a greater number of people co - living, consequently, a dwelling with a greater number of rooms.

Table 01: Percentage Distribution of Housing Characteristics for Elderly People from Minas Gerais

Variables	Distribution by age section			
	Total Elderly	Group 01 60 to 69 years	Group 02 70 to 79 years	Group 03 from 80
Elderly distribution	100	55.17	42.76	2.07
Type of Household				
House	89.70	90.04	89.34	87.88
Apartment	10.12	9.88	10.40	12.12
Convenient	0.11	0.08	0.16	0.00
Missing ²	0.07	0.00	0.10	0.00
Total	100	100	100	100
Domicile Occupancy Condition				
Own	87.36	86.67	87.87	95.29
rented	8.12	8.33	8.10	2.70
given	4.31	4.80	3.79	2.01
Other Condition	0.14	0.15	0.14	0.00
Missing	0.07	0.05	0.10	0.00
Total	100	100	100	100

¹ *Habitability* : the dwelling must be habitable, having adequate physical and health conditions. (Source: MIRANDA, Lívia. Human development and housing in Recife p. 02).

² It is the absence of values for certain variables caused by records with incomplete data or non-response situations.

Number of Rooms in the Housing				
1 to 3 Rooms	2.13	2.24	2.09	0.00
4 to 6 Rooms	48.98	47.56	47.59	35.93
7 to 9 Rooms	38.52	37.85	38.84	49.94
10 to 15 Rooms	10.00	11.72	10.50	14.13
16 to 24 Rooms	0.37	0.58	0.88	0.00
<i>Missing</i>	0.00	0.05	0.10	0.00
Total	100	100	100	100
Existence of Bathroom				
Yea	99.22	99.31	99.13	98.68
No	0.71	0.64	0.77	1.32
<i>Missing</i>	0.07	0.05	0.10	0.00
Total	100	100	100	100

Source: Own elaboration (2016).

The spatial dimensioning of the housing compositional environments (such as bedrooms, bathrooms, kitchens, among others) is one of the factors that most influence the suitability for the function performed by a given environment. Spaces with very large or very small dimensions in relation to the specific use of the room, for example, a bathroom, can negatively affect the use of this environment (BRANDÃO , 2006; REIS and LAY, 2002).

Access to urban services plays an important role in reducing urban poverty and preserving the health and well-being of family members. According to Massena (2002):

[...] the services, being a constant process of services to society, must be qualified not only in meeting the needs of hygiene and comfort of the family inside their dwelling, especially those of basic sanitation (water, sewage and waste solids), electricity, gas, telecommunications, but also in meeting the needs of mobility, safety, health, education, leisure, sanitation (drainage, sweeping the streets) and which are provided outside the home unit (MASSENA, 2002). , p. 06).

Regarding the materials used in the shape of the house (wall and roof), it was noted that most of the dwellings were made of masonry, 99.56%; and that their coverages were 71.38% of tiles and 26.87% of slabs, extending this trend to the three groups.

Regarding the urban infrastructure of basic sanitation services, it was found that almost all households were supplied with piped water, that is, in 98.31%. It is worth noting that, within the interface of the quality of life concept, an admittedly subjective concept, there is agreement on the indicators that express basic and sanitation services such as water, garbage, lighting and urban equipment such as hospitals, squares, etc. Access to these elements that promote quality of life, and which are supported by law, makes older people feel more secure, respected and valued (ALMEIDA ; GUTIERREZ 2007; VECCHIA , 2005).

Regarding sanitary sewage, it was observed that most houses were served by the sewage or rainwater collection network. In Group 01, 74.82% of the households were connected to a collection network; in Group 02, 74.30% and, in Group 03, 66.35%. According to Razzolini and Gunther (2008), the lack of adequate water supply puts the population at risk to health, favoring the incidence of contagious infectious diseases, especially affecting children, the elderly, malnourished and immunocompromised .

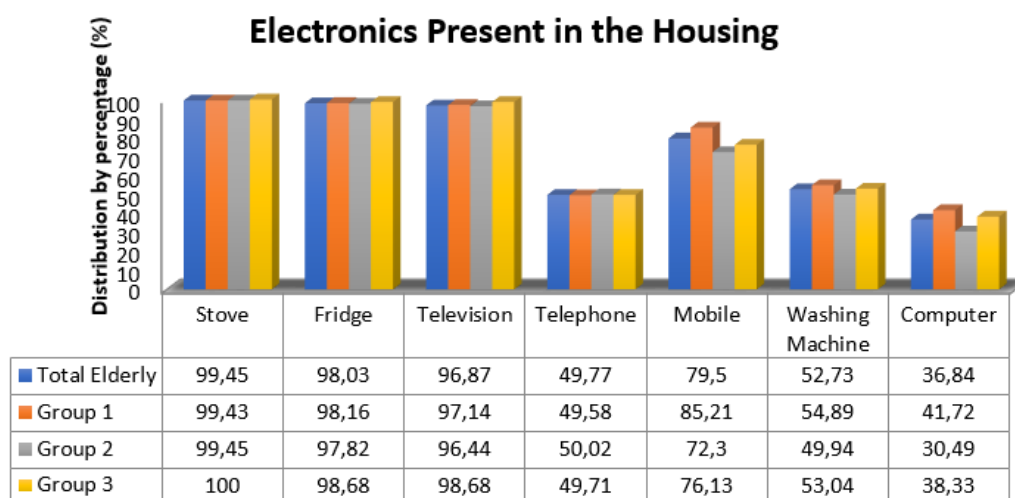
The absence, or even the inadequate and/or precarious supply of housing, basic sanitation and urban infrastructure, favors the social risk of the population exposed to these living conditions. Furthermore, the qualitative housing deficit indices increase (BONDUKI, 2000; MORAIS, 2002; PASTERNAK, 2003). These factors reinforce the existing pattern of spatial segregation and social exclusion. Thus, it is evident that housing has “[..] a strong impact on reducing poverty and improving the quality of life in Brazilian cities” (MORAIS, 2002, p.117).

The form of lighting revealed that almost all, 99.82% of households, were supplied by the electric lighting system and 0.11% by other sources of lighting, such as kerosene fuels and gas.

The reality regarding the destination of household waste behaved in the same way for the three groups. Garbage collected directly or indirectly by cleaning services or companies was 85.77% of the total, while 12.76% of residential waste was burned or buried on the property and the remaining 1.40% had another destination, such as thrown into rivers, land commons and others.

The technological advances of the 20th century reflected directly on the individual's life. Access to durable consumer goods, such as home appliances, encouraged the improvement of the lives of Brazilian families, as pointed out by Almeida and Guitierrez , (2007).

Graph 01: Percentage Distribution of Domestic Equipment Present in the Household, by Age Groups of Elderly People in Minas Gerais.



Source: Own elaboration (2016).

Durable goods associated with quality urban services, accessibility, urban mobility and personal safety; significantly improve the individual's living conditions, favoring their physical and mental well-being . Furthermore, they add value to housing, making it more qualified and adequate (ALVES, 2004; MASENA, 2002).

The most frequent household appliances were: the stove, with 99.45%; the refrigerator, with 98.03%, and the color television, with 96.87%. As expected, Groups 01 and 02 follow this same percentage frequency. Only Group 03 had a slightly higher percentage in the three appliances, corroborating the hypothesis that older elderly people have more accumulated resources. The refrigerator is a durable good

that is fundamental to the well-being and health of families, due to its nature of food preservation and also for adding value to income, since it favors the reduction of food loss. The refrigerator occupies the third place in the ranking of Brazilian consumer goods, and just like the stove, which is present in almost 100% of Brazilian households, they are directly linked to food and family health (ALVES, 2004).

Regarding the existence of a landline telephone, about half of the households with elderly people had such equipment, that is, 49.77%. The cell phone device was a consumer good with a very different existence in relation to the fixed one, since it was found in 79.50% of the households: in Group 01, with 85.21%; in Group 02, with 72.30%, and finally, in Group 03 with 76.13%. For Silva (2011), adherence to the use of electronic devices predisposes factors such as age, sex, educational level, economic level and housing. It is noted that the elderly people who are more receptive to technology are males, living in urban areas, with higher education and economic level.

Also in Graph 01, it was observed that in 52.73% of the households there was a washing machine and in 36.84% a microcomputer was present. It was observed in the 2000 census that 33% of households in Brazil had a washing machine. The busy life of most families makes this equipment of great value in the shape of domestic activities (ALVES, 2004).

The microcomputer is in full growth and diffusion in Brazilian society. It acts as a vehicle for work, leisure and helps in educational activities, and has been changing the current way of life (ALVES, 2004; REQUENA, 2002). However, [...] “The presence of microcomputers is essential to assess the number of residents connected to the Internet. The “Web” is an increasingly important interaction space for communication between people and for the creation of networks of work, education, citizenship” (ALVES, 2004, p. 34). Here, it would be appropriate to reflect, not necessarily the household that has a microcomputer and internet access has its elderly as users, many are not comfortable with technology and sometimes discouraged by their own family members.

4 FINAL CONSIDERATIONS

Housing is a component in the life of the elderly that deserves attention. It is in the habitat that this individual lives his daily experiences; moreover, it is inside the house that the elderly person tends to develop artifices and skills to deal with the inherent challenges of advancing age.

The research showed that the socio-demographic profile of the elderly person from Minas Gerais and the way of living have been changing. Individuals over 60 years old mostly live in their own 2 or 3 bedroom house made of masonry. Schooling shows a growing curve, because the younger the elderly person, the more educated, revealing possible changes in the profile of this contingent in the future. There are more elderly women than elderly people and a significant amount of this population lives alone and, for the most part, in urban areas.

Along with urban infrastructure services, access to durable goods at home gives the elderly person an improvement in living conditions, favoring their physical and mental well-being. Home appliances and

electronics are present in most homes of elderly people, especially the refrigerator with 99.45%; for the stove with 98.03% and for the televisions with the percentage of 96.87%. Information and communication equipment such as TV, telephones and microcomputers allow the elderly to interact with the extra-domestic environment.

Adequate housing is essential for the elderly to live in a healthy way, experiencing conditions that favor their well-being. The spatial organization of a house must promote this well-being, in addition to being compatible with the formation of the family (or families) that live there . Housing infrastructure and urban infrastructure where housing is located are fundamental components in the physical quality of the space where you live, thus providing housing with a fundamental character in the life of the elderly.

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CHAPTER 33

Telehealth as a tool to strengthen and expand the overweight and obesity care line

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ABSTRACT

The objective of this study is to train the multiprofessional team of primary and secondary care about the management of overweight and obese patients. In addition, to share the knowledge of the multiprofessional team of a bariatric and metabolic surgery program about the management of pre and postoperative patients in all related areas (nutrition, psychology, medicine, social work, nursing, physical education, and physical therapy) within the network of care for obese individuals.

1 INTRODUCTION

1.1 OBJECTIVE

The objective of this study is to train the multiprofessional team of primary and secondary care about the management of overweight and obese patients. In addition, to share the knowledge of the multiprofessional team of a bariatric and metabolic surgery program about the management of pre and postoperative patients in all related areas (nutrition, psychology, medicine, social work, nursing, physical education, and physical therapy) within the network of care for obese individuals.

2 METHOD

Each member of the multidisciplinary team is responsible for preparing a web lecture and deliver it via Telehealth (collaboration network that helps health professionals who work in Primary Health Care (PHC), related to their area of expertise in the Bariatric and Metabolic Surgery Program (BMCP). To facilitate the access to the web lectures, both for patients and primary care professionals, we created a communication channel (www.bariatricahucam.ufes.br) where all the themes and links to the web lectures are listed.

3 RESULTS

12 web lectures have already been given via Telehealth, with the following themes: Bariatric surgery in the late postoperative period - Warning signs, Physiotherapy in the preoperative period of bariatric surgery, Obesity - Promotion, prevention and health education, Psychological care before and after bariatric


surgery, Post Bariatric Plastic Surgery: Updates for Multiprofessional Team Follow-up Multiprofessional Preoperative Access in the Bariatric and Metabolic Surgery Program, Nutritional Approach in Bariatric Surgery, among others. Having already reached more than 21,200 views on the Telehealth channel on youtube since the beginning of the project in mid September/2019.

4 CONCLUSIONS

By using Telehealth as a tool for health promotion and education, we believe we have contributed to strengthening the Health Care Network for People with Chronic Diseases, regarding the organization of prevention and treatment of overweight and obesity. In addition, we collaborate in professional development, in partnership with the local manager of SUS (Unified Public Health System), inducing training and qualification for care to the obese, incorporating the conceptual and organizational frameworks of SUS as recommended by Ordinance No. 425 of March 19, 2013. Thus, contributing to a humanized and comprehensive care to patients with overweight and obesity.

CHAPTER 34

Complex and transdisciplinary analysis of the bolivian maritime enclaustration

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ABSTRACT

Within the policies and strategies to seek a sovereign exit to the sea of Bolivia, from the dialogic perspective is the Historiology that becomes the strategic analysis of history that differs from the Historiography that deals with the historical chronology, for that reason In this article, an analysis from complexity is developed to make known about the policy and strategy that Bolivia should employ in the maritime issue, taking a complex and transdisciplinary perspective, analyzing the multidimensionality of options and therefore it can be said that, "Chile does not it is the only way in which Bolivia could converge to gain access to a port and maritime coasts ". For this reason, for the present analysis, according to (Cruz Barreiro, 2009) Morín explained that: it will be necessary to consider that the human being is at the same time physical, biological, psychological, cultural, social and historical and this complex unit of human nature that it is disintegrated and must be restored in such a way that from where it is, it becomes aware and conscious of its complex identity and its common identity to all other humans. Throughout the last decades, the conditions of

international policy exposed by the state of Bolivia were more aggressive and had an impact at the international level, such is the case of the lawsuit before the Hague to force the Chilean state to negotiate that allow a sovereign exit to the Pacific Ocean. (Morin & Le Moigne, The intelligence of complexity Epistemology and Pragmatics, 2006) referred to the following: "As Pascal said, you have to conceive the circular relationship: you cannot know the parts if you do not know the whole, nor you can know the whole without knowing the parts. The notion of organization becomes capital because, through the reorganization of the parts into a whole, emergent qualities appear and inhibited ones disappear ". Then it will be necessary to reconnect this politics from multiple notions of order, disorder, organization and to recognize the problems of irreducibility and indeducibility of complex relationships existing between the parts and the whole to later unite the notion of unity with that of plurality or diversity and in this way, they come together in probable agreements. Because it does not have a state policy that integrates the different levels of leadership and power factors through a multidisciplinary defense with an integrated approach to the dimensions of power, the approach made by Bolivia was not adequate from what can be said. that, the court's decision was not the expected one, which had an impact on social morality due to the expectations that had been created, therefore, this article makes a complex analysis from a multidimensional perspective, giving way to a way of knowledge capable of apprehending objects in their contexts and at the same time in a set, gathering and organizing dispersed knowledge and in this way showing the indissoluble union between unity and diversity and all that is human

Keywords: Enclosure, policies and strategies, sovereignty, maritime access, Complexity , Transdisciplinarity, Multidimensionalit.

1 INTRODUCTION

Within the history of Bolivia, one of the most bitter pages that it had to live is the loss of its sovereign access to the Pacific Ocean, product of the ambition of the neighboring country of Chile that, through a tripartite war usurped sovereign territories that could not be resolved from the political dimension, which caused the maritime enclosure so fundamental for the economic development of a country. There were several attempts of negotiations that were carried out, the same that, denoted in false promises and failed attempts of negotiations that, in the course of time only brought the regret and discord between both countries which, until today maintain this problem without an approach of solution. For (Morin, 1999) In this analysis, the human being is at the same time physical, biological, psychic, cultural, historical and, being a complex unit, it is necessary to understand the multidimensionality of the points of view of the different countries, since when understanding the complexity of the perspectives, interests and the culture itself take precedence at the moment of assuming determinations that benefit the actors, since each individual, from his position, must become aware and conscious of his complex and common identity that characterize him from the rest. Therefore, in the present analysis, it is necessary to consider the emerging human condition as an essential object for any negotiation.

Consequently, in view of the events that took place, Bolivia filed a lawsuit before the Hague and the ruling was that Chile has no obligation to negotiate with Bolivia a sovereign access to the sea according to the International Court of Justice, therefore, a way should be sought to establish a dialogue on this matter between the two nations to reach a good agreement. On the part of Bolivia, the current president, Mr. Luis Arce Catacora, refers that the lawsuit does not clearly establish in its ruling that all negotiations are closed and that Bolivia would not give up its legitimate aspiration to its sovereign outlet, opening again the possibility of a debate that allows apprehending the objects in their contexts, without leaving aside their complexities and their sets without leaving aside the interests of the various actors.

2 METHODOLOGICAL STRATEGIES

This academic article of critical analysis has been developed in Bolivia based on a review and synthesis of information compiled on the progress of Bolivia's maritime confinement from a multidimensional chronological analysis with a complex and transdisciplinary approach to then address a new vision of possible alternatives that provide prospects for exits to Bolivia's Mediterranean Sea.

3 RESULTS

COMPLEX AND MULTIDIMENSIONAL ANALYSIS OF POSSIBLE WAYS OUT OF OUR MEDITERRANEAN NATURE

Given the current situation, it can be said that Bolivia does not have a clearly defined state policy and only promotes a government policy that develops management actions without future projection, denoting fragmented interests that do not allow to achieve the link between the intervening parties and the

totalities. This gives us to understand why the different historical opportunities for a sovereign access to the ocean did not have a favorable development. It is worth mentioning that, among the possibilities that Bolivia has to get out of the cloister, several hypotheses have been explored and even advanced for Bolivia to recover an outlet to the sea. These possibilities are little known because they were not generally disseminated or, failing that, they did not have the importance in the political and social sphere and neither were considered the multiplicity of perspectives that allow to recognize the unity and human complexity, allowing to gather and organize knowledge and dispersed needs that allow to show the indissoluble union between what some and also the other representatives want. In (apertura, 2011) the Summit of Latin America and the Caribbean (CALC) in 2011, President Evo Morales in his opening speech, called on "brother presidents to create a great integration", pointing out: "Bolivia is a pacifist country that seeks to have relations with all countries of the world that has the will to participate in all integration processes" III Summit of Heads of State and Government of Latin America and the Caribbean. 2011.

As it makes reference to (Longaric Rodriguez, 2014) history records important bilateral diplomatic efforts in 1950, 1961, 1975, 1986; as well as multilateral efforts whose results constitute acquired and inalienable rights, such as the resolutions of the General Assemblies of the OAS in 1979 and 1983. The Chilean Foreign Ministry at various stages of bilateral dialogue, as well as in the multilateral arena, publicly expressed its intention to support an outlet to the sea for Bolivia. Chilean pronouncements, sometimes as an offer and other times as a promise, are expressions that constitute unilateral manifestations with binding effects for the parties in question.

The following is a breakdown of these options:

The port of Ilo in Peru

In 1992, during the government of Paz Zamora, the most ambitious and realistic solution to the confinement of our country was announced, in which the governments of Bolivia and Peru signed a treaty by which Peru ceded to Bolivia the port of Ilo, which represents a coastal strip of five kilometers south of Peruvian territory, the same was ceded for 99 years, almost 27 years later, the dream of the port never took off and the beach never generated tourism, generating an uncertain and unexpected event. Thus, Bolivia Mar, has been abandoned for 26 years due to the scarce progress in state policies, as it says (Morin, 1999) deepening even more the uncertainty of our times and generating a lack of understanding between near and far, from its roots, modalities and effects, focusing on racism, xenophobia and contempt.

Puerto Busch-Paraguay

An even older alternative for Bolivia is an exit to the Atlantic thanks to a treaty signed with Paraguay in 1937 after the war with this country, in which the territories of the Chaco Boreal are granted and a clause indicates the Bolivian right to use the waters of the river for the exit to the Atlantic Ocean where the Bolivian

ships can reach the sea starting from their own docks after crossing the Paraguayan river, flowing into the Ocean. For (Morin, 1999) it is necessary to establish a relationship of mutual control between society and individuals through democracy and to conceive humanity as a planetary community, therefore, it is important to promote the awareness of the land - homeland, allowing it to be translated into the will to realize the earthly citizenship. For this purpose, the Bolivians built Puerto Busch, although its implementation has been slow, it is located on the border with Paraguay, in the department of Santa Cruz. These Bolivian docks are located in a strategic area because Bolivia has to exploit minerals and expand its railway services, so experts say it is necessary to promote the growth of Puerto Busch.

Argentina, Brazil and Uruguay

Through different treaties, Argentina, Brazil and Uruguay granted Bolivia facilities for the exit of its products through their coasts. The Bolivian government has even recognized that these concessions obtained over the last decades have not been used in an optimal way. As he says (Morin, 1999) In the face of a complex scenario, in order to move towards the expected result it will be necessary to consider ethics as a multidimensional factor of reality, being that it must be formed in the minds, starting from the awareness that the human being is at the same time an individual, part of a society, part of a species. From the aforementioned, it can be indicated that these complex scenarios, being surrounded by certainties and uncertainties due to their unpredictability due to a multiplicity of existing underlying factors which emerge from infinite causes that are constantly changing, if they are not analyzed in depth in a way that eliminates reductionism, errors will continue to be constantly made. Therefore, in order to retake the diverse agreements, in a way that allows to reconnect the separated knowledge, it is necessary to promote the capacity of deployment of human intelligence, so that it can demand and, in turn, provide a new reform of understanding.

Chile

The history of the Bolivian landlockedness has great conflicts for Bolivia, Chile and the whole region, and above all, it has a deep psychological, cultural and social significance. Since the beginning of his term of office, President Evo Morales established as a priority, to take steps to achieve the long-awaited exit to the Pacific Ocean and the re-foundation of the state. According to (Vera, 2016) the insistence of the government of Evo Morales since 2006, gave way to an unprecedented international demand that focuses on the idea that the unilateral acts of Chile, in order to put on the table the discussion on sovereignty, forcing Chile to a prompt and good faith negotiation on the matter. For this reason, analyzing Bolivia in the interstate order with its neighbor Chile, means to be located in the institutionalist paradigm of international relations, or under the neo-realist paradigm of international relations. After so many years and after Chile stripped the sovereign ports to the Pacific Ocean, it clearly denotes an economic damage since the trade

flow does not reach the expected level of performance compared to other South American countries since Bolivia is one of the countries that is exporting the least.

ACADEMIC HISTORIOLOGY FOR THE INTEGRATION AND SOLUTION OF THE MARITIME ISSUE. WAYS OF RESOLVING INTERNATIONAL DISPUTES

Along with the obligation, or better said, the commitment to find a peaceful solution to the ocean, in the face of the multiplicity of international differences, there is the principle of free choice of methods of dispute settlement, which is closely linked to the principle of sovereignty of States and their legal equality. (Cornejo, 2009). Thus, in order to face all these vicissitudes, it will be necessary to consider the transdisciplinary approach as a means of rediscovering the importance of the transdisciplinary approach. (Nicolescu, 1996) when it comes to rediscovering and unveiling this concept with lightning speed as a consequence of a necessary agreement and with the challenges of our convulsed world to discover the resurrection of the subject and the beginning of a new stage of our history.

From the above, it can be said that no State is subject to another since every State is sovereign. "Par in parem non habet imperium" It is then that the States are entitled to choose, within the mechanisms of International Law, the one they like or suit them best, as provided by Resolution 2625 of the UN General Assembly when determining that: "the settlement of international disputes shall be based on the sovereign equality of States and shall be in accordance with the principle of free choice of means" (UN, 2010). (UN, 2010) To this end, each state may choose diplomatic or non-jurisdictional mechanisms, such as negotiation, conciliation and international mediation. The accelerated development of the transdisciplinary approach must be considered in the understanding that it is a new movement of ideas and the danger of a multiplicity of deviations, be they the same commercial ones or the search for new means of domination of the other or, as it is said, of pouring nothingness into the world. (Nicolescu, 1996)of pouring nothingness into the void through the adoption of a "bon ton" slogan emptied of all content in order to permanently re-invent itself.

4 CONCLUSIONS

APPROACHING UNCERTAINTIES AND CERTAINTIES

For all the above mentioned in this article, in the maritime issue between Bolivia and Chile it can be said that:

- Bolivia and Chile have a negotiation pending, and must open their communications and dialogue, without haste but without pauses and interruptions, in an effective, sincere and conciliatory spirit, until a mutually satisfactory agreement is reached, This will only happen when Bolivia establishes a State policy that integrates the different levels of leadership and factors of power through a multidisciplinary defense with an integrated approach to the dimensions of power through reflection and action to achieve to

go between, from, through and beyond any ideology and together from the multiplicity of positions, converge in a future project that allows to build, to build and rebuild from making the new and the positive emerge.

- The Bolivian Constitution states that the country will not renounce to recover a maritime outlet "with sovereignty". Therefore, it is necessary to make a complex transdisciplinary study of the current reality and, given the events in the Hague, make policies and strategies to use its White power to persuade the population of northern Chile, which, given the circumstances, lives from trade and relations with Bolivia and therefore has a socio-cultural affinity and adaptation, it is even recalled that on occasion Bolivian flags were raised in protest to Chile's policies in the care of this region. This disjunction of thoughts existing between both countries, leads to a deep paradigm of simplification which, before any conceptual complexity, prescribes the being of implication/distinction/conjunction since it will allow the conception of preventing to conceive the human reality and the relation at the same time of implication and separation between man and nature. According to (Morin, 1999) the paradigm is unconscious, but it irrigates the conscious thought, it controls it and, in this sense, it is also subconscious.

According to (Lacoste, (2016) from a critical perspective, it is perceived that both Bolivia and Chile have approached the conflict with nationalistic approaches, which tend to demonize or minimize the other, with no capacity for dialogue or building consensus alternatives. Thus, a sort of discursive confrontation has been created between both nations, without greater prospects for a political solution.

Regarding other options of exit to the Ocean, after developing the complex analysis, the following can be said:

- In the issue of the exit through port Buch with countries such as Paraguay, Brazil and Argentina, Bolivia would become a pivot between the Atlantic and the Pacific and, in addition, from its status as the second gas power of the continent, could be consolidated as an energy reserve in the region, the discovery of Bolivian gas which has been the origin of new instances of rapprochement between several countries in the region. Nowadays, the exploration of new lithium markets has led international interests to focus on this product. This demystification from the complex and transdisciplinary approach, will allow the establishment of primordial relations considering the discourses and/or theories, organizing their organization, generating the generation or regeneration of ideas that converge in a subject-object benefit, on the one hand, a subject with ideologies and problems of existence and on the other hand, objects subjected to observations, experimentations and manipulations, thus being able to elucidate and blind, reveal and conceal.

- Regarding the other possibilities already mentioned concerning Puerto Ilo and Puerto Buch, governmental efforts must be made to develop State policies that guarantee the pursuit of actions to achieve the development of these and that they become the pole of development for our State. Therefore, all social, economic, political and cultural determinations must converge and synergize to imprison knowledge in a multideterminism of imperatives, norms, prohibitions, rigidities and blockages. It is only by recognizing these realities that we will be able to advance in a dialogue that will allow us to eliminate cognitive and intellectual conformisms. From the point of view of complexity, the logical context can be analyzed in such a way that unity and diversity, order and disorder can be conceived so that, from conflict, something new can be produced.

Consequently, it will be necessary to eliminate this homicidal ideology of the human being to eliminate the reductionism of thinking only of one's own benefit, promoting reflection and awareness of the multiple actors that are constantly changing to converge, as he says, in "establishing a relationship of mutual control between society and individuals or through democracy and to conceive humanity as a planetary community without leaving aside that there is no superior state of reason. (Morin, 1999) in "establishing a relationship of mutual control between society and individuals or through democracy and conceiving humanity as a planetary community without forgetting that there is no superior state of reason that dominates emotion, but rather, an intellect-effect loop; and in a certain way, the capacity for emotion is indispensable for the establishment of rational behavior".

In order to reach agreements that consider the existing uniduality between the underlying elements to solve the maritime issue between Bolivia and Chile, it will be necessary that rationalization prevails, which according to (Morin, 1999) "is believed to be rational because it constitutes a perfect logical system, based on deduction or induction; but it is founded on mutilated or false bases and refuses the discussion of arguments and empirical verification. Rationalization is closed and also open and takes the same sources of rationality, but it constitutes one of the most powerful sources of errors and illusions. True rationality, open by nature, dialogues with a reality that resists it". Therefore, this must be the great challenge not only for both countries but also for humanity.


Finally, as he says (Morin & Le Moigne, *The Intelligence of Complexity Epistemology and Pragmatics*, 2006). If we accept that there is a problem of irreducibility, of indeducibility, of complex relations between the parts and the whole, and if we also conceive a system as a unity composed of different parts, we are obliged to unite the notion of unity with plurality, or at least of diversity. Then we realize that we have to reach a logical complexity, because we have to unite notions that, by common and by logic, repel each other, such as unity and diversity and even chance and diversity, order and disorder have to be combined in order to conceive the genesis of physical organizations, then we are in the obligation to reconcile all those separate notions in the understanding that unfortunately was instilled in us since childhood".

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CHAPTER 35

Twitter social network and its interaction between the educational community and higher education institutions in Ecuador

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ABSTRACT

This research work presents an analysis on the interaction of the educational community to the publications made by the institutions of Higher Education in the social network Twitter, five public universities in the country were analyzed, from which 106 data were collected for both retweets and likes in the social network in the years 2017, 2018 and 2019,

where a summary of descriptive statistics was established and the average percentage growth rate (TCPP) was determined. The research design was established as non-experimental, field and with a longitudinal descriptive level, where it was obtained as a result that the Escuela Superior Politécnica del Litoral predominates the interaction with its community through a TCPP of 71, 76% and 116.63% for retweets and likes respectively.

Keywords: Interaction, Twitter, Higher Education, Average Percentage Growth Rate.

1 INTRODUCTION

Currently, social networks in the educational field have evolved constantly, this is because educational institutions, with more emphasis on universities in the country, see as an alternative to improve their corporate image by making publications of all kinds, in order to generate a significant impact to students, teachers or the general public who are in the interactivity with social networks or in the constant use of technology.

Twitter has one of the ideal characteristics to be used in educational and training processes or in the dissemination of content in a formal manner. Universities in Ecuador use this social network to publish educational content, offer their followers undergraduate and graduate academic offerings, publicize educational management processes, and disseminate important events in internal or external social contexts.

In the research conducted by Gallardo & Lopez (2020), on Twitter as a methodological resource in Higher Education, the interaction of enrolled students (137 students) in the subject of Introduction to Social Pedagogy, it was obtained that in the last 100 tweets of categorized students (teaching line 1 and 2) in teaching line 1 (67 students) was 82 contributions, where there were 17 comments and one retweet, and for teaching line 2 (70 students) was 52 contributions with 6 comments and 37 retweets. [1]

In the educational field, according to the study conducted by Guzmán Duquea & del Moral Pérez (2012), on the use of Twitter in Ibero-American universities, the average number of tweets shared by the institutions with their community was 2031 in December 2011, in addition the average number of tweets per university was 114 and in September of the same year was when the highest number of tweets was 149, it should be noted that the lowest number of tweets was in January with 55.

The interaction of followers with any page of the social network is done through four basic aspects implemented by Twitter, which are comments, retweets, likes and the share function, of which the first three can be counted, as it depends on the number of followers and above all that the user is online or performs a daily review of the publications made of the pages of interest. [3]

2 MATERIALS AND METHODS

Regarding the methodology and context of the research, a quantitative approach was used [5], where a descriptive statistical analysis of the interaction of the educational community to the publications made by five universities in the country on the social network Twitter was performed, using as data, the number of retweets and likes for each institution of Higher Education. The method applied is detailed below:

Five universities in the country, accredited in category A by the Consejo de Aseguramiento de la Calidad de la Educación Superior (CACES) and the ranking of universities established by the SCIMAGO INSTITUTIONS RANKINGS, were randomly selected.

1. The official Twitter page of the universities was accessed and a record was made of retweets and likes of randomly selected publications in 2017, 2018 and 2019.
2. Descriptive statistics were determined using Minitab 18 software.
3. Bubble charts were made according to the number of retweets, likes and percentage relative frequency for each Higher Education institution according to the established years, with the application of Minitab 18 software.

$$f_i = \frac{n_i}{n} \cdot 100\% \quad (1)$$

Where:

f_i is the relative percentage frequency.

n_i is the corresponding value of the category.

n is the sum of the values of all categories.

4. The average percentage growth rate was determined by applying the geometric mean.

$$X_g = \sqrt[n]{\prod_{i=1}^n X_i} - 1 \div 100\% \quad (2)$$

Where:

X_g is the average percentage growth rate.

X_i is the ratio of one year to the previous year.

n is the number of proportions in the analysis.

Note: The analysis of the comments on each publication was not considered, because in most cases there were no opinions from followers or they were very few.

Research design

The research design is non-experimental because the study variable is not controlled or manipulated, i.e., the variable is already established in a real context to be analyzed later. [4]

Type of research

The type of research is field research, this is because the data collection was performed directly where the facts occur considering the study variable and with the help of secondary information sources, this type of research allows a possible revision or modification with respect to the quality of the data obtained. [4]

Research Level

The level of research is longitudinal descriptive due to the fact that the data were collected in the years 2017, 2018 and 2019, i.e. in a time interval.

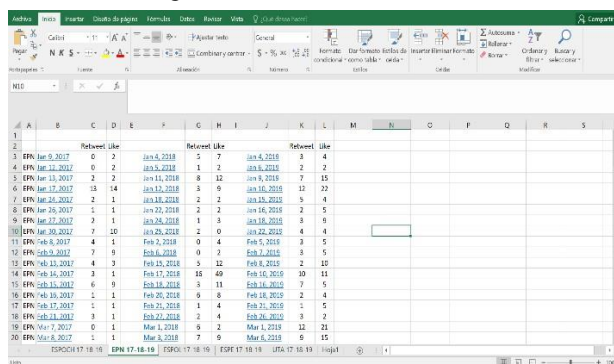
Sample

The Higher Education institutions considered in the research were established under a non-probabilistic purposive sampling, that is, it depends on the researcher's criteria and the interest of selecting a specific sample, in this case the universities analyzed were the Escuela Superior Politécnica de Chimborazo (ESPOCH), Escuela Politécnica Nacional (EPN), Escuela Superior Politécnica del Litoral (ESPOL), Universidad de Fuerzas Armadas (ESPE) and Universidad Técnica de Ambato (UTA), located in Ambato, Escuela Politécnica Nacional (EPN), Escuela Superior Politécnica del Litoral (ESPOL), Universidad de las Fuerzas Armadas (ESPE) and Universidad Técnica de Ambato (UTA), ranked 12, 8, 9, 11 and 4 respectively by the SCIMAGO INSTITUTIONS RANKINGS. [6]

Data collection techniques

The technique used in this research was direct observation, where the publications were analyzed through retweets and likes counted in the tweets originated by the Higher Education institutions selected for the analysis, the review of the publications was random and monthly. The data obtained were placed in an Excel sheet with the exact dates of the selected publications as evidence of the process.

Fig. 1. Record of data collection.



3 RESULTS AND DISCUSSION

Descriptive statistics

Table 1. Descriptive statistics

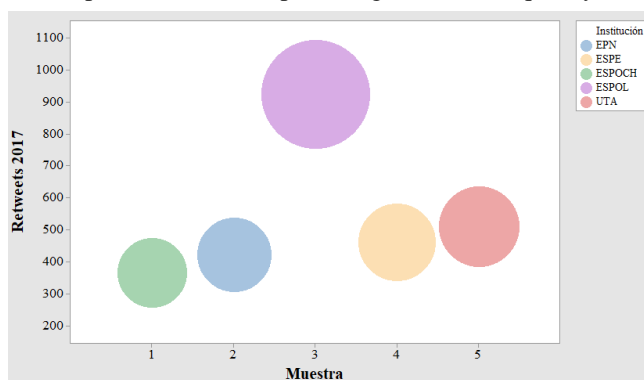
Institution	Followers	Year	n	Sum	Media	Standard Deviation
ESPOCH	13488	2017	Retweet			
			Like	612		
		2018	Retweet	510	5	
			Like	917		
		2019	Retweet	520	5	5
			Like	1345		
EPN	18873	2017	Retweet	420		
			Like	488	5	
		2018	Retweet	337		5
			Like	614		
		2019	Retweet	1067		
			Like	2075		
ENGLISH	61287	2017	Retweet	923		
			Like	938		
		2018	Retweet	1125		
			Like	1886		
		2019	Retweet	2723		
			Like	4402	42	91
ESPE	18585	2017	Retweet	461	5	
			Like	516	5	
		2018	Retweet	285		
			Like	637		
		2019	Retweet			
			Like	1074		
UTA	9347	2017	Retweet	509	5	
			Like	745		
		2018	Retweet	633		
			Like	880		
		2019	Retweet	543		5
			Like	800		

In each established year, 106 tweets (n) were analyzed according to the Higher Education institution, in addition, as the measurement scale was of discrete type (whole numbers), for the arithmetic mean and standard deviation (Std. Dev.) it was rounded to the nearest higher number.

In Table 1, it can be seen that in all cases the number of likes is higher than retweets, in addition, the Higher Education institution that has the highest number of retweets and likes in all years and that surpasses the other institutions is ESPOL.

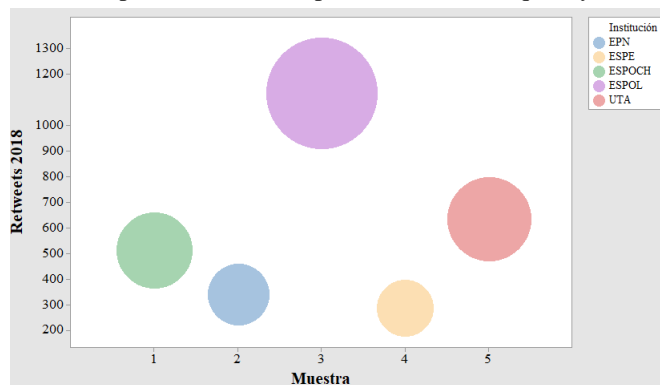
Bubble charts

Fig. 2. Bubble plot, retweets and percentage relative frequency, 2017. [7]



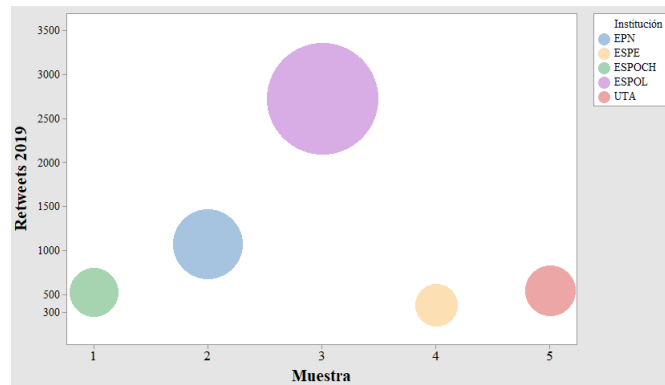
In Figure 2, it can be seen that the number of retweets in 2017 is led by ESPOL (1ro , with 923 retweets), followed by UTA (2do , with 509 retweets), ESPE (3ro , with 461 retweets), EPN (4to , with 420 retweets) and ESPOCH (5to , with 365 retweets).

Fig. 3. Bubble plot, retweets and percent relative frequency, 2018. [7]



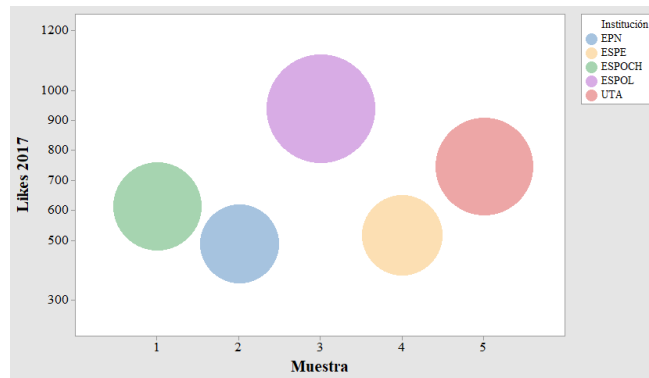
In Figure 3, it can be seen that the number of retweets in 2017 is led by ESPOL (1ro , with 1125 retweets), followed by UTA (2do , with 633 retweets), ESPOCH (3ro , with 510 retweets), EPN (4to , with 337 retweets) and ESPE (5to , with 285 retweets).

Fig. 4. Bubble plot, retweets and percent relative frequency, 2019. [7]



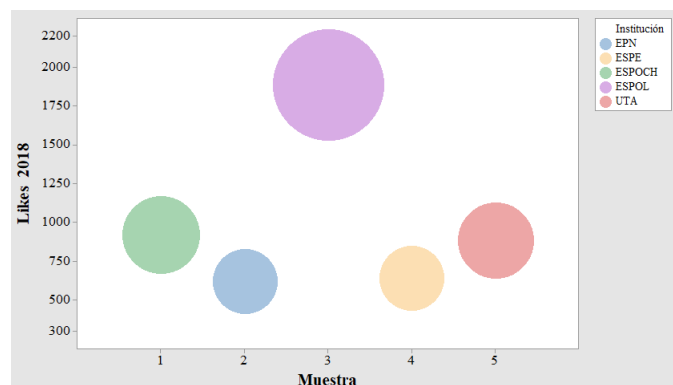
In Figure 4, it can be seen that the number of retweets in 2017 is led by ESPOL (1ro , with 2723 retweets), followed by EPN (2do , with 1067 retweets), UTA (3ro , with 543 retweets), ESPOCH (4to , with 520 retweets) and ESPE (5to , with 375 retweets).

Fig. 5. Bubble plot, likes and percentage relative frequency, 2017. [7]



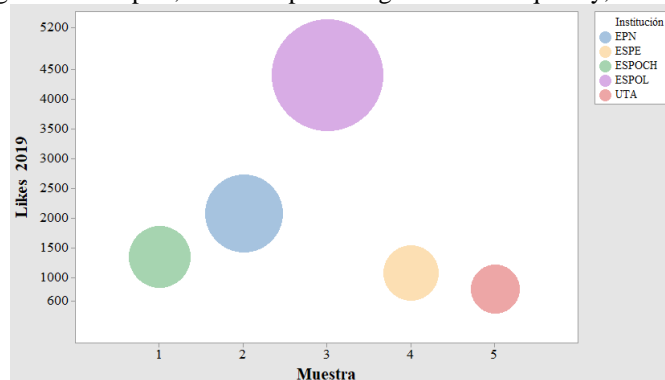
In Figure 5, it can be seen that the number of likes in 2017 is led by ESPOL (1ro , with 938 likes), followed by UTA (2do , with 745 likes), ESPOCH (3ro , with 612 likes), ESPE (4to , with 516 likes) and EPN (5to , with 488 likes).

Fig. 6. Bubble plot, likes and percentage relative frequency, 2018. [7]



In Figure 6, it can be seen that the number of likes in 2017 is led by ESPOL (1ro , with 1886 likes), followed by ESPOCH (2do , with 917 likes), UTA (3ro , with 880 likes), ESPE (4to , with 637 likes) and EPN (5to , with 614 likes).

Fig. 7. Bubble plot, likes and percentage relative frequency, 2019. [7]



In Figure 7, it can be seen that the number of likes in 2017 is led by ESPOL (1ro , with 4402 likes), followed by EPN (2do , with 2075 likes), ESPOCH (3ro , with 1345 likes), ESPE (4to , with 1074 likes) and UTA (5to , with 800 likes).

Average percentage growth rate (APGR)

Table 2. TCPP values

	ESPOCH	EPN	ENGLISH	ESPE	UTA
Retweets	19,36	59,39	71,76	-9,81	3,29
Likes	48,25	106,20	116,63	44,27	3,63

In Table 2, we can observe the growth rate in both retweets and likes in the established time interval (2017, 2018 and 2019) according to the selected Higher Education institution, where it can be noted that ESPOCH has a considerable TCPP, EPN and ESPOL the TCPP exceeds 100% in likes, ESPE has a decrease in retweets (due to the negative sign) and UTA the TCPP is small and there is no significant variation in retweets and likes.

4 FINAL CONSIDERATIONS

The use of the social network Twitter has had a growth in the interaction of the educational community to publications made by public universities in the country, where the ESPOL leads both in retweets and likes, it is presumed that it can infer the number of followers (3, 4 or 5 times higher than other institutions), As well as other factors such as the region where the university is located (ESPOL located on the coast), this leads to this type of research can be deepened, considering internal or external factors, in addition to involving statistical inference to raise and contrast possible hypotheses.



It was determined that the social network Twitter is used with greater emphasis in ESPOL to publish educational content, in order to inform the educational community of the efforts made by the authorities of the institution, it is also important to highlight the management of ICTs by the universities selected in the study, all are improving in a continuous improvement in the educational process and incorporating virtuality in their teaching- learning process.

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CHAPTER 36

Virtual forums as motivational tools to build meaningful learning in times of COVID 19

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ABSTRACT

The development of the virtual forum in remote education in rural areas of the district of Abancay, Apurimac region, during the COVID 19 health emergency has been presented as an opportunity for students to increase not only the cultural and cognitive level, but to mobilize competencies and capabilities characterized by being timely, reflective and self-

regulated. Therefore, the objective is to demonstrate the influence of the use of the virtual forum in the construction of meaningful learning. The research design in the present article corresponds to descriptive research, is simple correlational and transversal. The results show that the virtual forum as a motivational tool is motivating in 53.6%, promotes interaction in 51.8% and promotes self-learning in 42.9%, while significant learning does develop communicative capacities and competences. The conclusions determine that the virtual forum stimulates communicative skills and abilities, strengthens autonomy and self-regulation skills, allows feedback and promotes cooperative work and interaction between students and teachers.

Keywords: virtual forum, motivational tool, meaningful learning.

1 INTRODUCTION

The development of the virtual forum in remote education in the educational institutions "Micaela Bastidas" and "Edgar Valer Pinto" of the jurisdiction to the district of Tamburco of the district of Tamburco, province of Abancay, region of Apurimac, are presented as an alternative to the sanitary emergency of COVID 19 and an opportunity for the student to increase not only the cultural and cognitive level, but the mobilization of competences and communicative capacities. "The aim of the present work is to analyze the influence of virtual forums on the processes and results of collaborative learning, both at individual and group level through interactions in videoconferences." (Coll, 2015), because as a pedagogical tool it allows the development of students' self-regulation skills and as a formative assessment methodology it relatively replaces descriptive and conceptual aspects of a receptive education: (exams, notebooks, Google drive tabs and skill tests, etc.). In this regard, due to the pandemic problem, education takes place in a virtual environment with enormous difficulties that led to school failure during the year 2020, where teachers and students are not prepared in the use of virtual strategies in the learning process. An alternative is to train both teachers and students in the district of Abancay in work strategies with virtual forums to promote interaction and debate with motivating and current social and political topics, because it enhances characteristics of speed and effectiveness in the process of rural distance learning." (Harrison, 2019). On the one hand, as a virtual strategy it develops critical thinking involving aspects: cognitive communicative and socio-affective, because it helps us to understand the interventions and to create opinions during the

debate; on the other hand, it opens a world of possibilities to improve learning that implies freedom of the student to organize and plan their reflective learning activities within the framework of their performance and autonomy. (Pinto, 2019). That is, "with the virtual forum a cognitive conflict is generated, because it energizes skills of: analysis, inference, interpretation, explanation and evaluation characterized by being logical, rational, reflective, timely, argued and self-regulated. Therefore, it requires group cooperation to be able to solve problems of real or simulated situations through analysis and discussion". (Méndez, 2016).

The online forum, in spite of a certain degree of complexity, allows to effectively address the thematic contents of the "I learn at home" program according to the competencies and capacities in the different areas of basic education; therefore, it requires group cooperation to be able to solve them efficiently according to their skills and oral communication styles (Arango, 2004). At present, during remote education, the use of ICT technological resources is of great importance; in this sense, virtual forums have allowed the elaboration of judgments about ideas and the search for intelligent consensus to create an asynchronous multidirectional communication between students and teachers with a deferred feedback in learning activities" (Fabro A. P., 2004). (Fabro A. P., 2017).

In this context, the teacher's task in a virtual environment is not only to send cards through WhatsApp or upload activities through the classroom on the institutional platform, but also to replace the virtual forum, because with the use of various techniques of group participation, it allows users to post their messages at any time, remaining visible for other participants to enter later and read it or answer during the discussion. (Cando Almeida, 2021) It is an "interactive board" which has several options for easy access, allowing to manage various uses of individual or collaborative nature. P. 18-19. With this tool the diversity of techniques for teaching and learning are wide since videos, audios, files, links, images and more are added and annexed. For this route of work the teacher moderator has to design and open the debate motivating the organized groups to plan the learning experiences according to the transversal approaches in the health emergency, but without planning the quality of the debate would be deficient and would not improve the progress of the forum. In that line of ideas the question arises: to what extent do virtual forums as motivational tools influence the construction of meaningful learning in students from rural areas of Abancay in times of COVID 19 pandemic? "Finally, the mastery of participation strategies should be considered as a key factor in collaborative learning assisted by a technological resource that can be a computer, cell phone, laptop, television, platforms, Tablet or other resource." (Onrubia, 2009). For all of the above, the objective is to demonstrate the influence of the use of the virtual forum in the construction of meaningful learning in the students of the 5th rural secondary school of Abancay in the midst of the pandemic. The didactic resources are very important because they allow students to develop skills and abilities, which must be developed according to the basic years and areas of study. They play a very important role because without them learning would be less meaningful and would arouse less interest and motivation. (Espinoza Beltrán, 2017).

2 MATERIALS AND METHODS

The research design in this article corresponds to the descriptive correlational research carried out in rural areas and responds to the questions: How are they, where are they, how much are they and who are they, it points out the particularities and hidden conditions and basic figures of the situation in different realities in a present and past space (Alfaro, 2012). The research is simple correlational and cross-sectional, in this regard refers: "The usefulness and main purpose of correlational studies is to know how a concept or variable can behave with respect to the other variable and, cross-sectional because in the context of the year 2020 its purpose is to describe the variables and analyze their incidence and interrelation at a given time (Hernández, 2010).

Validation and reliability of the instrument

Regarding the reliability of the questionnaires, a pilot test was applied with a questionnaire of multiple questions with 10 items to a sample of 56 students out of a total population of 500 high school students of the educational institutions "Micaela Bastidas" and "Edgar Valer Pinto" of the jurisdiction of the district of Tamburco, with the test was intended to validate the relevance, relevance, clarity and sufficiency of the measurement instruments of the variables: virtual forums as motivational tools for the construction of meaningful learning. According to the results shown in the tables, students have shown great interest in applying virtual forums in the achievement of meaningful learning. The reliability of a measurement instrument is determined by various techniques, which will be briefly discussed after reviewing the concepts of validity and objectivity. Validity, in general terms, refers to the degree to which an instrument actually measures the variable it is intended to measure. For example, a valid instrument for measuring intelligence should measure intelligence and not memory (Hernández Sampieri, 2020).

Virtual learning as a remote activity takes place in a temporary external space; therefore, with the use of these digital tools, learners not only

accumulate information, but will be able to learn efficiently and autonomously in the construction of knowledge (Urquidi, 2020). Let us see some comparisons of results of learning sessions with and without virtual forums: Differences between groups, before and after, in the variable: Virtual forums and significant learning.

Learning sessions without virtual forums

In an academic session without virtual discussion forum with students of the fifth grade of secondary school of the Educational Institution ""Micaela Bastidas" and "Valer Pinto" of Abancay in pandemic time through the institutional platform, it has been demonstrated that the learning process is characterized by being very descriptive, theoretical and conceptual: (expository monologue, extension activities, exams, sending of cards in Google drive, skill tests, theoretical problems, etc.) that does not develop communicative skills and abilities, let alone critical thinking, because there is deficient motivation or

absence of social interaction. Students were only a mere receiver of knowledge, that is why they did not participate, did not pay attention, did not report their evidences to the platform, some felt bored, apathetic, committed indiscipline, others did not connect due to technical difficulties and most of them felt unmotivated in the virtual learning process. The level of interaction with the learning materials is significantly associated with student motivation in these environments (Beltran Baquerizo, 2020).

Learning sessions with virtual discussion forums

In an academic session through a virtual discussion forum, significant differences are observed in a communication environment that favors a collective learning space among its participants based on their interactions and exchanges in debates around a specific topic, which are recorded sequentially. For the development of the forum, the following criteria were established: answering a question, replying to the answer of another peer and counter-replying to the opinion received from a peer, having an open mind to accept other points of view, challenging others to be innovative with critical thinking and evaluating alternatives. The results revealed significant rates of controlled autonomous motivational behavior. This means that students improved their ability to learn with the help of their peers, because their organization is planned: a) The moderator initiates the forum,

b) The forum rules are pointed out, and c) The moderator summarizes the opinions and draws conclusions.

In the midst of the virtual pandemic, it is possible to create discussion forums, videoconferences and virtual classes on topics offered by MINEDU in the "I learn at home" platform. In this contextualized scenario, students are the ones who exercise control of self-regulation and learning, because they generate a cognitive conflict, where the skills of analysis, inference, interpretation, explanation and evaluation of academic activities are dynamized. In addition, it has the purpose of obtaining information on the progress of a student to provide feedback on their weaknesses, including the teacher to improve their teaching strategies.

According to (Osores, 2019, pp. 3-5) he formulates his theory in the epistemological field as a proposal that virtual classes is an opportunity to develop not only competencies, communicative skills or knowledge, but to interact with facts and phenomena different from their social reality through videoconference meetings.

In this context, the mastery of these digital tools becomes very important to achieve effectively during remote education caused by COVID 19. For which it is essential the implementation of educational systems to prepare future students in these times of health crisis, because it demands new knowledge, teamwork initiative to strengthen social skills. (Cueva, 2020).

3 RESULTS AND DISCUSSION

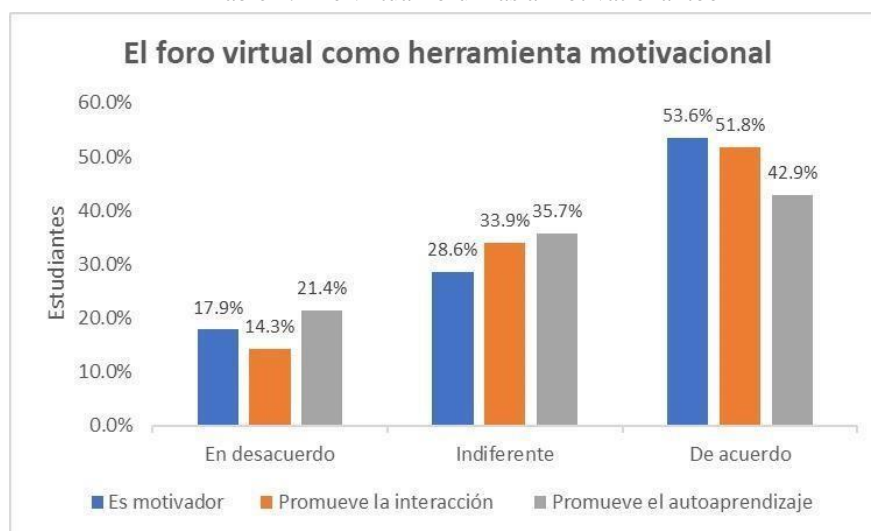
The questionnaire validates the influence of the virtual forum in the learning process, in which results are obtained from a sample of 56 students of the "Micaela Bastidas" and "Edgar Valer Pinto" Educational Institution in the rural area of Abancay.

Sample

The population of the current research is constituted by students of the secondary level of the aforementioned Educational Institution, jurisdiction of the UGEL- Abancay, which groups a population of 426 students. Valderrama (2015). "It is a representative subset of a universe or population, it is representative, because it evidences exactly particularities of the population at the time the sampling technique is used (p. 184).

Operational definition of the variable 1. For the virtual forum as a motivational tool, a multiple-choice questionnaire with 10 items was applied to measure the dimensions of motivation, interaction and self-learning through an evaluation system: (1) Disagree, (2) Indifferent and (3) Strongly agree.

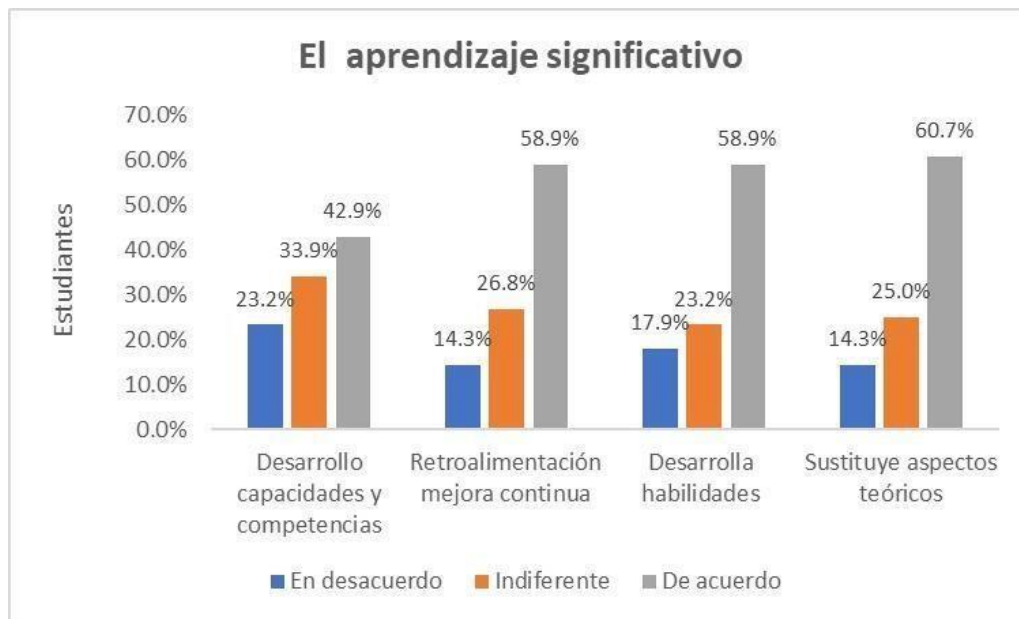
Table 1. The virtual forum as a motivational tool



Source: Own elaboration.

For the virtual forum as a motivational tool, the dimensions have been measured through the multiple-questionnaire, the results of which percentages were: if it is motivating, 53.6% totally agree. In the dimension that allows interaction, 51.8% totally agree; and in the third dimension: Promotes self-learning, 42.9% agree. We can deduce that, according to the results, a higher percentage of students improve their learning with the application of the virtual forum strategy, because it is characterized by the richness and abundance of data. The teacher's mission is to be a facilitator, guide and counselor around the appropriate sources of information, creator of habits and skills for data processing to obtain quality learning (Castro Méndez, 2016). (Castro Méndez, 2016).

Table 2. Meaningful learning.



Source: Own elaboration.

For meaningful learning, the following dimensions were measured: If it develops communicative skills and competencies, 42.9% were found to be in agreement. In the dimension that allows for feedback in learning, 58.9% totally agree. In the dimension, that if it allows the development of analysis and inference skills, 58.9% and in the dimension: it substitutes theoretical and conceptual aspects, 60.7% of students agree with this strategy; therefore, they consider that it is no longer necessary to use descriptive, conceptual and theoretical aspects in learning, because it obeys a receptive and memoristic education. The reason for measuring student satisfaction.

(Alvarez, 2015) argues that student satisfaction is a valuative indicator of educational quality, because the articulation of academic and administrative services denotes efficiency and satisfaction, for which the work must be comprehensive starting from the learning sessions, with the interaction of students and teacher; as well as with the facilities and equipment for the good use of virtual technology that will serve as an indicator of efficient educational management. (p.15-26).

(Gonzales, 2017). Distance education at this juncture of health crisis becomes an alternative access to training in different spaces and at different times; without However, students living in rural areas whose agricultural working conditions and disability decrease their concentration to attend virtual teaching. Consequently, student satisfaction is efficient as long as the improvement of opportunities and pedagogical innovation are promoted (p. 243-260).

They reveal that many students who participated in the forum offered assertive possibilities of opportunity and collaborative interaction in learning, despite the limitations due to distance and the possibility of regulating emotions to deepen their reflections in virtual pedagogical practice". (Martinez M., 2019). Indeed, the motivational aspect of the use of technological resources is a field of scientific research,

because the objective of study has been to analyze whether students in rural areas are motivated to learn different subjects in videoconferences (Morilla García, 2019).

Study dimensions:

Motivation in learning

The virtual forum strategy becomes relevant when the student awakens interest in their own learning, because they constitute a significant contribution in the development of the different curricular areas, in addition it favors collaborative group work, autonomy and critical thinking in the learning process". (Fabro P. , 2017). Motivation in learning positively influences the development of metacognition and critical thinking. This study shows the importance of the role assumed by the teacher in generating a good climate that favors the use of learning strategies and improves the academic performance of students (Navarro Gómez, 2021). That is, if we apply the virtual forum based on real cases, motivation will be relevant and their learning will be more active, autonomous, reflective and critical.

Virtual interaction

The importance of the virtual environment lies in the need to structure cognitive, social and organizational interactions that students perform in order to improve their learning. The purpose of the study is to understand the aspects that must be considered in the interaction for the expected learning to take place and to analyze the students' perceptions in relation to the types of interaction that occur in the collaborative learning process (Hernández Sellés, 2021).

Virtual interaction as a process of uninterrupted hyperconnection favors sociability in the digital environment. The changes that technological innovation has brought about in social interactions affect scenarios, processes and the relationships of the actors. Therefore, if the subject interacts with others, it enables the formation of new virtual social bonding (Zapatero, 2017).

Self-learning

Self-learning promotes curiosity, problem solving, defines a learning pace, seeks information and diverse learning methods. Currently, there is a significant increase in interest in issues related to self-learning associated with the diffusion of new technologies, the rapid expansion of information and the use of a digital competency approach in the construction of meaningful learning. This has given relevance to the ideas of lifelong learning and self-learning in pedagogical theory and practice (Kenesbekova, 2019).

Virtual classrooms as social networks complement face-to-face physical interaction with digital resources at different educational levels. The purpose is to exchange information and didactic material with virtual education projects (Vidal, 2016). Learning is defined as a process of acquiring skills and abilities to assimilate new information with cognitive strategies and action (Copari, 2015).

Virtual feedback

In the face of learning difficulties, the teacher provides reflective or discovery feedback for students to discover and reflect on their own performance. It is a proposal to support the student through a Feedback Platform. This tool works as a forum: the teacher posts the name of the topic and students participate by contributing ideas on the topic (Pereira Sarmiento, 2019.).

Importance of digital competencies

It is important to clarify that the transcendence of digital competencies from the panorama of Educational Technology, as manifested by: Marza and Cruz (2018) are assumed by way of instruments of great utility that allows the mobilization of attitudes, knowledge and processes, but parents are not prepared to accompany and monitor the pedagogical activities to their children, because they do not know the use of virtual environments (Britez, 2019). In this regard, since 2008, UNESCO has established three approaches to digital competencies: a) understanding and integration of technological competencies, b) application of technological knowledge to solve real and concrete problems and, c) production of new knowledge from the already generated. (Lévano Francia, 2019).

Comparative assessment of the experience of students' use of virtual forums

In variable 1: virtual forum as a motivational tool, the dimensions have been measured through the multiple-question questionnaire, whose percentage results were: if it is motivating, 48.6% totally agree. In the dimension that allows interaction, 62.9% totally agree; and in the third dimension: Promotes self-learning, 42.9% agree.

In variable 2: Meaningful learning, the dimensions were measured and the results were: If it develops communicative skills and competencies, 45.71% agree. Feedback improves learning, 65.71% totally agree, and in the dimension: replaces theoretical and conceptual aspects, 54.29% of students agree with this strategy.

A comparison was made with the results of a study at the Arturo Prat University, Faculty of Health Sciences of Chile, and there are coincidences and similarities in the behaviors during the exploration of the virtual forum as an evaluation strategy to develop the self-regulation skills of university students. The sample was composed of 35 students in their first year of three careers in the health area. A quasi-experimental pre- and post-test design was used. The intervention consisted of using the virtual forum multidisciplinary to analyze and solve cases during four months with inter-group forum self-evaluation averages of high and low participation. With respect to the groups' evaluation of the forum, it can be seen that the high participation group exhibited higher averages in all dimensions, which produced significant group differences in all dimensions. Thus, the students in the high participation group consider that the virtual forum stimulated their attitudinal dimension (DA), that is, their attitudes and mental dispositions to investigate and learn, generate their own opinion, demonstrate a critical sense and negotiate ideas. In the

cognitive dimension (CD), students used skills for understand, analyze, reflect, refine, synthesize and argue complex ideas, as well as to elaborate a value judgment on their own and other people's ideas. In the self-regulatory dimension (DAR) they trained critical thinking, awareness of rethinking ideas, seeking clarity of expression and respect for the critical and intelligent opinion of others.(Castro Mendez, 2016).

At the end of the virtual forum, the self-evaluation instrument allowed students to openly and freely express comments on their virtual work experience. Let us look at some of the responses:

- "I had a hard time debating, the forum helps me to create opinion and to respect the points of view of the participants". I had never participated before, it is very entertaining to debate and exchange my points of view with my colleagues.
- The development of the virtual forum creates expectations for the improvement of the pedagogical task, because it addresses a perspective of reflection on the emerging pedagogies of the virtual environment (Pando, 2018).
- In the development of the virtual forum it has been observed that participation levels improve, they feel more motivated to participate collaboratively with timely guidance from the teacher (Martínez I. , 2019).
- The topics should be current political-social and health topics, i.e. motivating, in addition, an exact time should be set to connect and exchange ideas (Gonzales, 2017).
- Ignorance of technological resources hinders connectivity, the learning process, as they will not meet their goals, depends on the pedagogical proposal of continuous training with technological innovations (Dos Santos, 2018).
- During the development of the virtual forum, groups with better learning results tend to maintain or increase the use of socioemotional discursive strategies and use them during the development of online collaborative tasks (Ramirez, 2020).

Self-determination theory. -The development of virtual forums links personality, human motivation and optimal predisposition in a given context. According to studies by psychologists Edward Deci and Richard M. Ryan, they propose the satisfaction of three psychological needs: autonomy, competence and commitment.

Which favors the internalization of motivation. The online forum in a "Remote Learning Project" is a powerful resource and a collaborative communication work with Internet services or virtual learning environments that encourages debate, agreement and consensus of ideas between students and teachers; therefore this pedagogical tool provides a space for academic discussions that promote the development of critical and reflective thinking, because it allows developing self-regulation skills of students and as a formative assessment methodology relatively replaces the descriptive and conceptual processes: (exams, Google drive tabs, skill tests, theoretical problems, etc). In addition, it has the purpose of obtaining information on the progress of a student to give feedback on their weaknesses, even to the same teacher to improve their teaching strategies and learning styles. During the pandemic online face-to-face learning has

been seen as a paradigm shift in secondary education, taking momentum from the "self-determination theorist" framework that generates impact on the remote learning process with the active participation of students.(Shah, 2019).

Self-regulation theory. According to research shows that those students who have this ability tend to have a higher academic performance in the achievement of learning, because it is a process of self-generated thoughts, emotions and actions that are planned and adapted to achieve the attainment of goals and objectives. Therefore, the motivational effect of the use of technological resources is very relevant, because studies show that students are more motivated to learn different subjects with the development of videoconferencing." (Morilla García, 2019). Therefore, it is relevant to talk about the educational technological infrastructure to understand and comprehend the definition of software and the management of digital tools and resources; however, if there is no efficient use of the available technological resources it will hinder the learning process. Consequently, the efficient use of technologies in rural schools depends on the pedagogical proposal, the physical space and continuous training and technological innovations (Dos Santos, 2018).

Virtual didactic material

Virtual didactic materials should be adapted to the different characteristics of the students and to the contexts where the teaching-learning process takes place.

Adaptability allows for tailoring instruction to individual learner needs for applications, systems, and contexts (Torres, 2019).

Adaptability, according to (Sandoval, 2017) is the adjustment of characteristics of the learning environment, in order to achieve a personalized education model adapted to the learning capabilities according to the needs of each student. Educational platforms reinforce learning adaptability:

- Adaptive learning adapts the pace of study of a given subject to the individual needs of each student, with benefits for both students and teachers.
- It favors greater student attention, because the online interrelation with virtual forums motivates the learning process.
- The development of virtual forums should be progressively adapted to the students' learning, because it is necessary to master methodological strategies in the use of digital resources.

4 CONCLUSIONS

The strategies of the virtual forum as a motivational tool generate a cognitive conflict, because the skills of analysis, inference, interpretation, explanation and evaluation of academic activities are stimulated.

The virtual forum as a methodological strategy for learning achievement will be very successful when students in rural areas strengthen their autonomy and self-regulation skills".

Cooperative work with the virtual forum strategy leads us to achieve significant learning through interaction between students with high and low participation; therefore, they require feedback.

In the evaluation system, the virtual forum strategy measures learning achievement and favors the development of cognitive and social skills.



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CHAPTER 37

Affectivity: new relationship paradigms in the hyperconnected world

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ABSTRACT

Introduction: the family evolved and changed its paradigms, transforming itself into measures that accentuate relationships linked to feelings of affection, happiness and family love, valuing relationships anchored in affection. Initially, it highlights the

transformations that have taken place in family concepts and then analyzes the importance of affectivity in family relationships, because the principle of affectivity was instituted to deal with these new standards instituted and supported by the country's legal system. Objectives: to demonstrate some benefits of using technological resources in affective relationships. Methodology: the article adopts the deductive method, a process of information analysis that using logical reasoning and deduction to reach a conclusion about family relationships and affectivity with depth and legal basis, treated by scholars on technological evolution and its implications in family relationships. Considerations: the importance of innovation of familiar concepts in today's world is verified, but that society must be cautious with the relationships built through technological platforms.

Keywords: Family, equality, technolog, Affection.

1 INTRODUCTION

With the promulgation of the 1988 Federal Constitution, the concept of family was expanded, directly influencing the affective relationships between parents, children and affective unions. Notably, new values were introduced in family relationships, based on the principle of human dignity and affection (LÖBO, 2008).

The study seeks to highlight the transformations of family concepts and the construction of affective relationships in today's world, in which society has experienced considerable changes in the field of family law and, more intensely, in the hyperconnected virtual universe, as well as in the use of technological tools to work, study and relate to each other, especially through dating applications.

A pesquisa terá como base o entendimento de diversos doutrinadores renomados no Direito Brasileiro, a exemplo de Maria Berenice Dias, Carlos Roberto Gonçalves e Maria Helena Diniz, since they address in their works the issue of family relationships and affection with depth and legal basis, in addition to other authors who deal with technological developments and their implications in family relationships.

In order to elucidate this article, some benefits of the digital transformation in affective relationships will be presented, highlighting how affection plays an important role in the construction of new family groups, as is the case of the socio-affective filiation.

At the same time, a critical analysis will be made of how affection has been neglected and even trivialized by the ease of access to information technology and dating apps..

2 THE TRANSFORMATIONS OF FAMILY CONCEPTS

The family structure has been undergoing constant changes, many of them resulting from the evolution of society and the desires of its members, in which the traditional model loses space to new conceptions of family organism. On this point, Hironaka elucidates (2004, p. 222):

Men change. Their social groupings change. Institutions change. Legal institutions change. The family changes. Family relationships change, not to be different, but to play new and distinct roles. A eudemonist family is built, in which the sentimental relations between the members of the group are emphasized: the affective functions of the family are valued and it becomes the people's privileged refuge against economic and social pressures.

In view of the understanding of the changes that are currently taking place in this field, it is clear that the recognition of the coexistence of multiple parental bonds, besides being a possible reality, is also feasible and necessary today. Therefore, the Law and its operators are being increasingly urged to expand their knowledge in research and studies to better understand these new family types, seeking harmonious legal solutions, based on the principles of human dignity, solidarity, family coexistence and interest on behalf of children and adolescents, principles that are intrinsically related to affectivity (BARROS, 2013).

In fact, as society has developed, the family has also undergone profound changes over the years, brought about by the evolution of customs, norms and technology. These changes became more evident with the advent of the 1988 Federal Constitution, which implemented profound changes in the concept of the patriarchal family, establishing new paradigms based on fundamental principles and values. Consanguinity, once absolute, was supplanted by the importance of affection in family relations.

In this perspective, the developments in Family Law, introduced by the Federal Constitution, accelerated the relaxation of traditional and conservative norms and brought, among others: the concept of multi-parentality, the recognition of children born out of wedlock, the recognition by stepfather or stepmother and the homoaffective union, the latter recognized by the Supreme Court in ADI 4277 (LENZA, 2012).

Indeed, after rooting the idea of affection as a fundamental principle of the family, affective relationships have come to represent an advance and greater security within family society. In this scenario, the socio-affective parentage has gradually gaining importance and recognition by law and jurisprudence, ensuring that affective parents have the same rights and duties characteristic of the one granted to the family power and, likewise, guaranteeing children equal rights to consanguineous ones (DINIZ, 2012).

It is relevant to mention that affection has been widely safeguarded in family relations, to the point that article 1.593 of the Brazilian Civil Code of 2002 states that there can be no discrimination between types of filiation, because "kinship is natural or civil, as it results from consanguinity or other origin" (BRASIL, 2012). Thus, it is clear that the socio-affective recognition is supported by the principle of immutability of the filiation status, because affection is very important in these family relationships, so that currently it is easy to convalidate in the administrative sphere.

In this sense, Souza (2018) states that in 2017, CNJ's (National Justice Council) Proviment No. 63/2017 was published, facilitating the recognition of socio-affective filiation, as transcribed below:

Art. 10. Voluntary acknowledgment of paternity or socio-affective maternity for persons over 12 years of age will be authorized before civil registry officers for natural persons. (Redaction given by Providence n. 83, of 08.14.19).

§ 1º The voluntary acknowledgment of paternity or maternity will be irrevocable, only being able to be deconstituted through a court of law, in the hypothesis of vice of will, fraud or simulation.

§ 2º Those who are eighteen years of age or older, regardless of marital status, may request recognition of paternity or maternity of a child.

§ 3º The socio-affective paternity or maternity cannot be recognized by the siblings among themselves nor by the ascendants.

§ 4º The intended parent must be at least sixteen years older than the child to be recognized.

Art. 10-A. Socio-affective paternity or maternity must be stable and socially externalized. (Included by Provision 83, of 08.14.19)

§ 1º The registrar must certify the existence of the affective bond of paternity or maternity by means of objective verification through the verification of concrete elements. (Included by Providence n. 83, of 08.14.19)

§ 2º The applicant shall demonstrate the affection by all means allowed by law, as well as by documents such as: school register as the student's guardian or representative; enrollment of the alleged child in a health plan or social security agency; official record of residence in the same household; marital relationship - marriage or stable union - with the biological ascendant; enrollment as the applicant's dependent in associations; photographs in relevant celebrations; notarized statement from witnesses. (Included by Providence n. 83, of 08.14.19)

§ 3º The absence of these documents does not prevent the registration, as long as the impossibility is justified; however, the registrar must certify how he ascertained the socio-affective relationship. ([Included by Providence n. 83, of 08.14.19](#))

Thus, it is important to highlight that affection has been preponderant in several types of relationships and in the specific case of filiation, as long as the person interested in recognition complies with the requirements established in the CNJ's Provision, it is possible to have social-affective recognition administratively.

Undoubtedly, throughout history, the concept of family has undergone numerous transformations, seeking to keep up with the evolution of society. With this, significant changes were implemented resulting from the process of modernization, urbanization, technological advances, evolution of customs and norms, among other factors that contributed to engender the great evolutionary leap of the concept, expanding to encompass new family entities, constituted not only by marriage, especially its great importance to society (DIAS, 2017).

According to the prevailing view, relationships are socially based on affection rather than property interest, contributing to the decrimonialization of Family Law. Considering that the social factual realities are what give rise to law, it appears that affection will soon be present in the Brazilian legal system. However, for some scholars, there is already the principle of affection, containing its support in the 1988 Constitution (OLIVEIRA NETO, MEIRELES, 2014).

It is a fact that the family is still considered the fundamental core of society, because it is the first institution that human beings find shelter, security and stability to interact with their peers, developing the bonds of affection, denoting the importance of the development of kinship ties, the harmonious and lasting coexistence, the rules of social coexistence and equal treatment to all members of the family entity (CALDERON, 2017).

On the other hand, it is important to note that society lives in the so-called post-modernity and this, in turn, has brought significant changes, driven by the revolution of technology and globalization and, necessarily, required the family to be understood under a new perspective. However, precisely in this sense and in response to social desires, the 1988 Federal Constitution radically changed the family paradigm (BITTAR, 2005).

Indeed, it is important to note that Article 1, III, of the 1988 Federal Constitution establishes the principle of the dignity of the human person, positively revolutionizing the entire Civil Law, causing what has been called the depatrimonialization or repersonalization of this branch of Law. In this sense, the rules began to be aimed at people first, so that it brought more protection to the family nucleus, leaving the patrimony in second place (CASTRO, 2006).

As already mentioned, in view of the transformations that have occurred in family relations, a deepening of studies was required from the doctrinaire, aiming to understand the significant changes. Tartuce and Simão (2010), teach masterfully that this organization evidences a "trend of personalization of the Civil Law, alongside its de-patrimonialization, since the person is treated before the property. That is, the family entity begins to be seen as a group linked by affection, where its members help each other, and is no longer given that connotation of production and reproduction unit as in the past.

In the same line of understanding, and in a very didactic way, Lôbo (2014, p.173) adds:

The excessive preoccupation with patrimonial interests that marked traditional family law does not find an echo in today's family, marked by other interests of a personal or human nature, typified by a distinct agglutinating and nuclear element - affection. This nuclear element defines the factual support of the family protected by the constitution, leading to the phenomenon that we call repersonalization.

The family nucleus is the place where the person will be fully realized, where his/her dignity will be preserved, because the link between the family members is no longer the accumulation and maintenance of assets, but rather affection, love and mutual reciprocity.

In fact, there is no doubt that there has been a great evolution with regard to filiation in Brazilian law. Based on the former Civil Code, the concept of family was restricted to the union of a man and a woman as individuals able to contract matrimony through marriage.

However, with the evolution of society in recent times, family paradigms have been rethought, modernized and updated, despite the omission of the Brazilian legal system, which is slow and refractory to change and flexibility at the heart of the concept of family, which adopts a pluralistic model.

3 AFFECTIVITY IN FAMILY RELATIONS

The affection is being considered the fundamental pillar for the constitution of a family, while the Civil Law has been undergoing major changes to suit the new form of family constitution. Indeed, the principle of Affectivity was instituted precisely to address these new patterns, since affection adheres new paradigms for family relationships (PEREIRA, 2014).

It is important to note that the principle of Affectivity is implicitly inserted in several provisions in the Brazilian legal system, and has been paving a new family model, as occurs with the plurality of genitors, whether biological or affective. And, despite not being expressed in the Federal Constitution, affection is currently considered the main foundation of family relations, and can be interpreted as the valuation of Human Dignity which is, in turn, the principle mater (PEREIRA, 2006).

However, with the evolution of society and the changes that have occurred, the family scenario has undergone considerable changes and families have been constituted in various ways, always supported by affection, which has been considered, in many cases, as a determining factor in family relations, such as socio-affectionate parentage, in terms of Provision No. 63 of the CNJ, a situation that consists of true multi-parenting.

In this sense, Madaleno (2000, p. 17) states that:

[...] the Constitution changes the object of legal protection and stops extolling, as it had always done in the name of domestic peace, only the conjugal family and starts to give protection to any of the constitutionally accredited family entities, regardless of the formality or informality of their origin and even when constituted by only one of the parents, and any community should be preserved only as an instrument to protect the dignity of the human person.

And, in the same sense, shares Lôbo (2014) that affection is also included in the precepts of dignity, non-intervention of the State in families, so that the citizen has complete freedom to form the type of family entity that best meets their needs and desires. This means that, analyzing precisely article 226 of the Federal Constitution, it is verified that it does not bring the specific type of family to be protected, since the legal effects of protection are for any type of family construction.

However, it is important to note that all changes in this area have caused a significant change in Brazilian Civil Law, although for many authors working on this issue, the "constitutionalization of Civil Law" would be operationalized, especially because the family is not only the biological one, but mainly the one constituted by ties of affection, affection, care and love, and that such relationship is gradually built through the days of living together within the family.

In this sense, Lôbo (2014. p 175) understands that there is a repersonalization of the Law at the moment the State starts to protect the person instead of the patrimony:

The challenge that jurists and the law face is the ability to see the human person in all its ontological dimension and not as a simple and abstract subject of a legal relationship. The human person must be placed as the center of the legal destinations, valuing being and not having, that is, being the measure of property, which starts to have a complementary function.

This means that the individual value of each should be observed before any consideration, valuing the affection between people, because it is clear that, with the evolution of society, the family has been losing the character of patrimonial institution, especially with the industrial revolution and the renewal of the labor market, while marriage is no longer the best way to acquire property.

However, nowadays, family models, regardless of the disparity in their formation, play the roles that society assigns to the family, guided by the principles established in the Constitution, such as the dignity of the person, freedom, and equality. This gives more respect to the affection between the members of the family entity and allows each one to pursue their individual goals, without the obligation of fulfilling a specific function as a result of the place they occupy within the family.

In this scenario, although there is currently no state intervention in the choices of individuals, it is up to the State to provide the means to ensure the fundamental conditions for healthy family development, because the traditional family has evolved, and the significant changes have made it more democratic and inclusive.

In this sense, Dias and Gramstrup (2016, p. 56) ponder that,

According to the prevailing doctrine, the view of affection seeks to eliminate any doubt about the possibility of forming family groups that escape the traditional models. This more human and realistic view, which sees in affection the family-forming element, eliminates prejudice and segregation, bringing to the surface the respect that must be had with the new forms of family. In practice, we have the application of the equality principle, as well as respect for difference.

Thus, it is important to note that the principle of affection is supported in the Federal Constitution, so that the scholars from then on began to adjust their understandings on the issue of affection and its contribution in family relationships, since it does not depend on their origin, whether consanguineous or not.

Lôbo (2014, p. 103) when discussing the subject, noted that:

The principle of affection is intertwined with the principles of family cohabitation and equality among spouses, partners and children, which emphasize the cultural and not exclusively biological nature of the family. The evolution of the family "expresses the passage from the natural fact of consanguinity to the cultural fact of affinity.

Therefore, one can affirm that the gradual transformations that society is experiencing, with varied family constructions, are based on affection, although there are indications that many relationships start from a superficial contact through digital platforms, consequently because technology has contributed to affective relationships.

4 TECHNOLOGY AS A TOOL IN FAMILY RELATIONSHIPS TODAY

Technological advancement has been driven in recent decades loaded with the most varied alternatives, both in relation to new forms of communication and information sharing, as well as the numerous benefits provided to society, especially with regard to family relationships, which have been strengthened by affection (ALVES, 2011).

However, it is important to understand the relevance of digital transformation for today's society, since society is living the Fourth Industrial Revolution (SCHWAB, 2016).

In fact, it is from intelligent policies that a technological management is achieved, guaranteeing the provision of services and solutions that promote the notorious social welfare, in view of which, much is discussed about the influence of technology in contemporary relationships.

Therefore, inevitably, in some way, people will be impacted by technology, whether for economic, political, work, artistic, passionate or religious reasons, because these elements have always influenced human relationships. With the constant technological evolution and the several forms of social interaction, the dependence on electronic equipment is more and more urgent, whether as a work tool, for affective interaction, or for other purposes, which has led many people to technological addiction (DUMAZEDIER, 1994).

Hodiernly it is common to use digital platforms to seek a relationship, whether casual or even for a lifetime. These interactions are established by the screens of the devices that broadcast the image of the interested party to the virtual world. It is the recognition and dependence on technology being widely

used as a channel to bring people together. In this sense, a research published in 2018¹ points out that Brazilians are among the users who most connect on social network applications.

In fact, technology has favored great transformations, especially in the last few years, with the Covid 19 pandemic that has ravaged the world. The paradox is that digital technology, which at the same time expands social interaction and the way of relating, encourages loneliness and distancing, since controversial and problematic issues, such as intolerance and foolish discussions are potentiated in digital media. For this reason, technology, which shortens distances, also separates and isolates.

On the other hand, many professions have been created and others reinvented, as well as the emotional relationships that have evolved over the past few years, in such a way that many dating apps have been created and are being used by thousands of people as a way to get closer and, many times, even consolidate relationships that until then were not part of the population's daily life.

It is evident that, with the development of information technology and the facilities made available in applications for contacts and virtual relationships, the lives of people who use these platforms have become more exposed and privacy more vulnerable. In the same proportion, anxiety, mistrust, and tolerance have grown, leading to a decrease in dialogue and understanding between people.

Although, in fact, affective relationships in the digital age have been driven by the development and popularization of apps, and has contributed greatly to the acceleration of affective relationships in today's world, because technology has already been a tool of many transformations in the development of society, whether in the economy, in work relationships and now in affective relationships (MULLER, 2018).

However, despite the advantages of all the technological advancement involving considerable changes in society, it is important to note that, in family relationships, some characteristics have drawn attention, since the ease in building emotional bonds through technological resources has influenced in such a way that unions have become more superficial, due to less tolerance for conflict, less patience and more immediacy.

This is because technologies provide knowledge and facilities never before experienced, but, equally, it is driving people apart. Although it is attractive and charming, at the same time it is shortening this class of responses, and the logical consequence is the estrangement of people, since it has caused a true social isolation.

It is important to mention that today's society moves with technology, and for this reason the ways of relating go through transformations, because we live in a hyperconnected world. In this way, Bauman (2004) teaches that society is living in the post-modern world, in which love relationships are

¹ Source: Research commissioned in 2018 by Match Group, a company that develops niche apps (e.g. for evangelicals and single parents).

in a slight transition, becoming looser, freer, and more transitory. A world in which people are effectively seeking an ever greater and more pressing need for personal satisfaction. Is it the trivialization of affection in relationships? Or its valorization to allow all people to be happy in their relationships?

In fact, the development of society and the diffusion of the media, the way they are, end up influencing and dictating some rules of relationships, perhaps giving an importance beyond or below the principle of affection, which should be the basis of any relationship, because with just one click it is possible to exclude or insert a person in your group of relationships.

However, with the advent of new information technologies, new ways of relating have been created, but many of them are based on private interests. In this sense, Bauman (2004) emphasizes that the romantic definition of love as "until death do us part" is in disuse, because relationships are increasingly superficial, in which people have sought immediate pleasure instead of a long-lasting relationship.

For Bauman (2004), the emergence of virtual proximity makes human connections simultaneously more frequent, more intense, and more ephemeral. Love connections become too brief and banal to be condensed into bonds. Note that these connections are protected by the possibility of extrapolating and engaging partners beyond the time and action of the typed and read message, which is the opposite of what human relationships practice.

Furthermore, relationships practiced in the virtual environment require less time and effort to be established, and consequently to be broken. There is neither the barrier of distance nor of time to be an obstacle to get in touch.

However, being in contact with someone is not an obstacle to remaining apart. The spasms of virtual closeness end, ideally, with no leftovers or permanent sediment, as a relationship can be ended just by pushing a button. The most important realization of virtual closeness seems to be the separation between communication and relationship.

As already reported, technology has contributed to affective contacts being established very quickly and without much effort, and likewise they can be broken off easily. This is because the post-modern man is marked by individuality, for he has had more care and appreciation for himself than for his neighbor.

5 FINAL CONSIDERATIONS

Given the situation analyzed and presented in this article, it was found that the concept of family has been transformed as social changes occur, and especially the technological ones, causing scholars to position themselves more effectively.

Article 1, III, of the 1988 Federal Constitution established the dignity of the human person and the family is no longer considered a patrimony, because it brought affection to legal protection and currently the family groups are constituted by the bonds of affection, because everything is directly related to affection between people.

It is important to note that, with the changes that have come from the transformations in society, a new type of family emerges, such as multi-parenting, which has made possible the coexistence of the same family nucleus, the coexistence of affective and biological fathers and mothers, and likewise siblings who may be consanguineous or affective.

On the other hand, it is worth mentioning that technology has favored many people to get closer and start an affective relationship through technological platforms, a logical consequence of the reality in which society is living, in which most people are somehow immersed in this digital universe.

However, despite the ephemeral nature of today's affective relationships, it cannot be denied that technology has contributed to the building of many families. Thus, it is imperative to conclude how important and healthy the coexistence of several types of relationships is, especially in today's world and in the acceptance of the most diverse family models, which have human dignity and affection as their pillars.

Finally, it is verified that the transformations in the family concepts have been carefully analyzed and protected by the operators of the law, but society must be cautious with the relationships built by means of technological platforms, so that the values and protection of the several types of affective relationships that have been arduously conquered are not trivialized, because technology must enable the advance of family concepts, as well as their protection and not the opposite.

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CHAPTER 38

The role of the dentist in the diagnosis of mucoepidermoid carcinomas of the parotid glands

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ABSTRACT

Mucoepidermoid carcinoma is the most common malignant salivary gland tumor in the oral cavity and affects mainly the parotid gland. Regarding its epidemiology, the incidence of MSC is higher in females and the mean age of patients is 45 years with

a peak between the 4th and 6th decades of life. The clinical behavior of MSC is highly variable, ranging from indolent tumor growth to highly aggressive metastatic spread. However, the prognosis will depend considerably on the clinical stage of the lesion, its anatomical location, the histopathological grade and the treatment adopted. Given this, the objective of this study was to discuss the importance of the role of the dentist in the early diagnosis of mucoepidermoid carcinoma in the parotid gland and the result in the prognosis. As for the methodology used, it consists of a narrative literature review, through a search in Google Academic, Scielo, BVS, PUBMED. The diagnostic method is done through palpation, but as there are several differential diagnoses, it is essential that an incisional biopsy is performed for histopathological analysis. It was found that the participation of dentists brought several benefits related to the prognosis of patients with mucoepidermoid carcinoma, due to the possibility of metastasis or the simple fact that it is a malignant tumor and compromises the parotid gland, the dentist's role in diagnosing clinical signs early is essential for a favorable prognosis.

Keywords: Mucoepidermoid carcinoma, Parotid gland, Dentist.

1 INTRODUCTION

At neoplasms in glands salivary constitute a group rare in tumors, corresponding The about 3 The 5% of all head and neck tumors (Gonçalo, et al., 2020). This low incidence may be related to ethnic and geographic. fence in 80% in all at neoplasms in gland salivary (NGS) are benign, being at evil most rare (Costa, et al., 2020).

The main benign histological types are: pleomorphic adenoma, Warthin's tumor, myoepithelioma, cell adenoma basal and oncocytoma. In between you types evil you main are: carcinoma adenoid cystic, mucoepidermoid, ex-adenoma carcinoma, acinic cell carcinoma, myoepithelial carcinoma, adenocarcinoma, basal cell carcinoma (Melo, et al., 2017).

O carcinoma mucoepidermoid (CME) hits fence in 2.8% The 15% From cancers salivary, being, therefore, O type more common in that place. (Kansou, et al., 2021). O CME It is O tumor most common

in gland parotid, attacking most you female individuals. The mean age of patients with NGSs is 45 years with a peak between the 4th and 6th decades of life (de Vasconcelos, et al., 2020).

Histologically, they are classified into low-grade tumors (cystic lesions, rich in mucous cells, well-circumscribed), intermediate-grade (generally more solid and less circumscribed), and high-grade tumors (nuclear anaplasia, necrosis, increased mitotic index, and bone invasion). , perineural and lymphovascular) (El-Naggar, et al., 2017).

The etiopathogenesis of carcinoma in some cases may be associated with genetic factors or exposure to radiation and/or habit. in smoke. O tumor epithelial if originates gives reservation in cells of duct excretory, O which O behavior biological varies from low to high level. However, all levels are capable of metastasis (Gomes, et al., 2015).

According to Vergara (2021), the 10-year overall survival rates for low-, intermediate and high-grade MSCs correspond to 90%, 70% and 25%, respectively, but low-grade mucoepidermoid carcinoma has a low risk of regional metastasis. and remotely, therefore, its treatment corresponds to oncological surgical resection, with a safety margin, without the need for adjuvant therapies such as radiotherapy or chemotherapy, with a good prognosis and without relapses, in 90% to 98% of patients with isolated resection surgery.

Diagnosis is based on clinical analysis and complementary tests, the main ones being magnetic resonance imaging and fine needle aspiration, often guided by ultrasound. Computed tomography does not have a prominent place in the evaluation of these parotid tumors. (Bonfils, et al., 2017).

Its clinical presentation is variable, it is usually seen as a painless mass with or without facial deformity, with an association of painful symptoms, paresthesia, dysphagia, trismus or adenopathies. However, it can also present asymptotically (Lévano, et al., 2021).

The primary treatment of malignant tumors of the parotid gland is usually surgical. The extent of surgery depends on the histopathological type. With the correct preoperative diagnosis, a better assessment of the possible extent of surgery he can help O surgeon at the planning preoperative and at the counseling to patient, already what O emptying neck and facial nerve sacrifice may be necessary in the case of a malignant tumor. Although imaging techniques provide much information for The evaluation From tumors gives gland parotid, O exam histopathological or cytological he must to be used for correct surgical planning (Altin, et al., 2019).

Thus, the present study aims to discuss the importance of the dental surgeon in the early and safe diagnosis of parotid mucoepidermoid carcinoma, demonstrating the importance of a previous diagnosis and its implications for the prognosis.

2 METHODOLOGY

The present study is a narrative literature review. According to Santos (2021), this methodology does not use explicit and systematic criteria for the search and critical analysis of the literature. The search for studies need not exhaust the sources of information. No apply strategies in search sophisticated and exhaustive. THE selection From studies and The interpretation of information may be subject to the authors' subjectivity. Addressing, in a qualitative way, the role of the dentist in the diagnosis precocious of patient carrier of carcinoma mucoepidermoid in region in gland parotid. In wake up with Galvão (2017), research with qualitative methods provides detailed descriptions of complex phenomena, including their contextual aspects.

O lifting bibliographic he was accomplished through gives base in Dice of: Google academic, SciELO, VHL and PUBMED, locating scientific articles in the time interval from 2015 to 2022 that contributed to the elaboration of this study.

By having as criteria in inclusion: reviews in literature, reviews systematic and reports in case what approach The analysis of the early diagnosis of mucoepidermoid carcinoma in the parotid gland by the dental surgeon.

While the exclusion criteria were: book chapters, monographs, course conclusion works, conference proceedings, and articles that did not reconcile with the topic addressed were discarded. In addition, publications in Portuguese, English and Spanish were searched.

Searches were first carried out through the keywords in the databases, then the reading was performed. From titles what evidence O paper of surgeon- dentist at the diagnosis of Carcinoma mucoepidermoid. Per The end, 35 articles were adopted from the reading of the full text to approach this job.

The search was performed with the following descriptors: [Mucoepidermoid Carcinoma]; [Parotid Gland]; [Dental surgeon];

3 RESULTS AND DISCUSSION

Between the years 2015 and 2022, 248 articles on the topic were identified, which were selected by the year of publication, title and usefulness of the content for the objective. After that, 33 articles were adopted that met the inclusion criteria, addressing the topic of diagnosis of mucoepidermoid carcinoma in the parotid gland.

The scientific literature addressed in this review found the importance of the role of the dentist in the favorable prognosis of patients with MSC when performing an early diagnosis. Of the 33 articles chosen, 22 analyze the behavior of mucoepidermoid carcinoma and its diagnostic methods, 4 report the pattern of head and neck tumors, focusing us what attack at glands salivary, 5 present O pattern epidemiological of CME and 3 discourse about cancer treatment mucoepidermoid.

According to Barradas (2018), mucoepidermoid carcinoma usually presents as an asymptomatic increase in volume, and can be clinically confused with a mucocele when in the minor salivary glands, and the presence of the lesion is usually perceived with a year or less of evolution.

According to Costa (2020), the clinical history of salivary gland tumors is commonly constituted by the description of painless and slow-growing masses. Regarding the clinical picture, parotid mucoepidermoid carcinoma has one presentation clinic based in a increase in volume, 34% From patients also presented pain, paralysis and trismus, and the main complaint was the presence of a painless nodule or facial bulging in 86.1%, followed by a nodule with local pain in 5.8%, ulceration in 1.7% and facial paralysis in 0.6%.

Freitas (2020), observed what O main symptom reported by the patients It is The presence in lesion nodular only in 100% of cases, O what corroborates with O what if he thinks at literature. THE presence in pain he was criticism in 16.7% From patients, and some studies relate this symptom in general to the presence of malignancy, as Altin (2019) also stated that in the most severe cases it is common to present more intense symptoms, such as pain, facial paralysis and ulceration of the skin. skin.

In addition, Morais (2019) argues that palpation by the dental surgeon is of paramount importance, as it is an excellent clinical parameter for the topographic location of the lesions, and even for their classification, in terms of malignancy. In agreement, Gurgel (2020) reports that the presence of nodular lesion was the most observed symptom in MSC, meaning that the detection for the palpation It is also a resource assistant effective. According Sousa (2019), O adenoma pleomorphic (AP) It is The The most common salivary gland neoplasm is a benign tumor, with the parotid gland as the most affected site. Clinically, a painless, fixed, slow-growing and firm swelling is observed on palpation. In agreement, Reis Fernandes (2019) also says what O adenoma pleomorphic It is The neoplasm benign most common gives gland parotid, representing about 60 to 70%, and with a higher incidence from the 4th to the 6th decade of life. Therefore, this lesion becomes one of the main diagnoses differentials for O carcinoma mucoepidermoid, per to possess O same place in involvement predominantly, in addition to similar signs and symptoms. Thus, the conduct in cases of clinical uncertainty is to perform a biopsy, which depending on the location of the tumor will be incisional or excisional.

Furthermore, Lima (2015) states that when we consider the spectrum of salivary gland neoplasms, we realize that they represent a diagnostic challenge for clinicians, surgeons and pathologists, demanding, in most cases, the execution of more invasive complementary procedures, such as fine needle aspiration (FNA) and incisional biopsy, in order to allow a detailed histological examination of its structure, in order to reach a diagnosis accurate.

Coelho de La Cruz (2020) reiterates other possibilities of differential diagnosis of MSC such as necrotizing sialometaplasia of the palate, mucocele, inverted papilloma or cystadenoma, cystadenocarcinoma, primary or metastatic squamous cell carcinoma and low-grade pleomorphic adenocarcinoma.

According to Barradas (2018), histopathologically, the MSC is composed of a mixture of mucus-producing cells, squamous cells (epidermoids), and also intermediate cells. Mucous cells are variably shaped but contain abundant foamy cytoplasm that stains positively with mucin stains, and epidermoid cells are characterized by resembling squamous cells, usually demonstrating polygonal shape, intercellular bridges, and, rarely, keratinization.

In concord, Rodrigues (2016) also says what O CME It is histopathologically compound in cells producers of mucus and cells epidermoids or scaly IT IS considered in low grade in malignancy When it presents atypia cell minimum with high concentration in cells mucous membranes and in high grade When it presents pleomorphisms and activities at mucosa, in addition in larger proportion of squamous cells that grow rapidly and accompany pain symptoms. The intermediate grade is composed of the three cell types and constitutes the most common histopathological type. All variables can develop metastases, which can infiltrate neighboring tissues, regional lymph nodes and even distant organs, such as the brain, bones and lungs.

According to Dutra (2017), the imaging findings of these tumors vary depending on the histological grade. On computed tomography (CT) low-grade (I) tumors present as a well-defined mass, with a cystic predominant, and a component solid any less expressive, with calcifications associated. Fur contrary, high-grade tumors (III) present as solid masses, with early contrast uptake, with irregular contours and infiltration of adjacent structures. Intermediate grade (II) tumors exhibit a pattern intermediate.

According to Altin (2019), fine needle aspiration puncture (FNA) is the test indicated for the cytopathological diagnosis, which has the function of differentiating between benign and malignant neoplasms, since cytology alone usually does not determine the definitive histological diagnosis. Salama (2015), in his studies on the salivary glands, reports that FNA accuracy of 97.4% was found for parotid tumors.

According to Pinheiro (2021), neoplasms of the major glands are staged according to the tumor classification. lymph node metastasis (TNM), While what at in GS minors are staged in wake up with The your localization. You studies in Image (CT, MRI) obtained before diagnosis can provide important information for staging. Clinical staging is determined from clinical information prior to initiating any treatment, based on physical examination, imaging studies and analyses. anatomopathological.

In agreement with Pinheiro (2021) and adding details about the staging, Amin (2017) states that the pathological staging provides more data than the clinical one, obtained after surgical excision of the tumor, with anatomopathological analysis of the neoplasm and lymph nodes. removed, which may differ (or not) from the clinical stage. The results of the TNM classification are combined to determine the stage of the cancer, divided into stages ranging from 0 and from I to IV.

After clinical analysis and complementary exams (FNA, USG, CT), Sheila Maria (2020) states that if the nature of the nodule is not elucidated, the next step is to perform a superficial parotidectomy with identification and preservation. of nerve facial, followed in exam in freezing, Where The lesion nodular It

is removed without The exposure gives your capsule, being indicated in lesions smaller than 4 cm, mobile and located in the superficial lobe of the gland. in cases of deep lobe involvement, total parotidectomy should be indicated, Choi, (2018) reports on the importance of surgical resection and says that it is still the method of choice in the treatment of malignant salivary gland neoplasms. For parotid lesions, the intervention indicated is parotidectomy with conservation of the nerve. facial.

According to Xavier (2020), the identification of precursor lesions of oral cancer in early stages allows for a more effective treatment, with less aggressiveness and, consequently, a longer survival. In view of this, Guedes, et. al. (2021) highlights The importance in a diagnosis precocious fur dentist for to guarantee O treatment adequate, prognosis favorable and better quality of life for the patients.

In wake up with Oliveira (2020), at the time of diagnosis, Many patients are Classified in stages advanced due to to fact gives illness to be generally asymptomatic us stages initials, O what takes The demand late per attendance and, this often compromises the prognosis. Therefore, the dentist is the key player in the detection of tumors in the initial phase, a crucial stage in the treatment of patients. Furthermore, in line with this, Fonseca (2020) states that the dental surgeon plays a role in the care of cancer patients, significantly helping to minimize the sequelae caused by the disease and treatments.

Wedge and gurgel (2020), agree that The main technique in diagnosis pointed It is through of maneuvers in inspection and palpation, Where per quite of these already if get up The suspect in neoplasm, confirming under O exam histopathological, in what in that.

In this question, it is noted the importance of understanding the most frequent locations, how and what are changes in the surface of the oral cavity, demonstrating, again, the importance that the dental surgeon needs to have sufficient knowledge to detect these changes.

Therefore, the dentist has the role of raising the suspicion of the diagnosis, by observing the characteristic behavior of Mucoepidermoid Carcinoma in the parotid gland through palpation, observation of signs and description of symptoms by the patient. In case of suspicion of the present pathology, the professional should request complementary imaging exams and accomplish biopsy incisional for prove The suspect, promoting so, a diagnosis precocious, but safe, in addition in perform the correct referral to the head and neck surgeon to follow up on the treatment.

4 CONCLUSION

In view of the analysis performed, the dentist has a fundamental role in the diagnosis of mucoepidermoid carcinomas of the parotid gland, because despite being considered a rare tumor, it is the most incident in this gland.

Thus, as it is considered rare, it is natural that professionals do not generally include it as a diagnostic suspicion, however, as it is a neoplasm and has the possibility of suffering metastases, the importance of early diagnosis and correct management of this pathology is emphasized to ensure adequate treatment and a favorable prognosis.

Therefore, the dentist is a key player in the diagnosis of tumors in the oral cavity in its initial phase, in addition in to be paramount your acting as a professional what accompanies in form multidisciplinary O patient during O your treatment. In addition from that, during The search he was notorious The gap what exists at literature about O paper of dental surgeon at the diagnosis of neoplasms evil. Of that form, it is done required what works futures address it is theme, bringing Dice statisticians in how many patients evolve for a painting in metastasis same being accompanied per dentists who did not initially diagnose the tumor.

Such research will serve mainly to alert professionals trained in dentistry to make them aware of responsibility in accomplish a diagnosis need in carcinoma in gland parotid, comprising what It is holder sufficient knowledge to perform such a feat, as it can prevent your patient from having an evolving neoplastic clinical picture without adequate treatment.

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CHAPTER 39

The importance of institutional support in the implementation of protocols and care flows in primary health care in municipalities in the state of amapa: experience report

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ABSTRACT

The Assistance Protocols and Flows in the work routine are important to face problems in assistance and in the management of services. These instruments are guided by clinical and organizational guidelines and are based and validated by studies and scientific evidence, in addition to incorporating new technologies into services. In this aspect, aiming at the organization of the Health Care Networks in the State of Amapá, specifically at this moment the Maternal and Child Care Network, the Care Network for People with Chronic Non-Communicable Diseases and the Urgency and Emergency Network, it was observed during the accomplishment of a Situational Diagnosis the need to implement Protocols and Assistance Flows, as well as the accomplishment of in-service training for the health professionals of the cities of Laranjal do Jari, Vitória do Jari, Oiapoque, Cutias do Araguari and Amapá, thus aiming qualification in the assistance provided to users of the Unified Health System and the strengthening of the referred networks in the State. The research is descriptive with a qualitative approach of the Experience Report type. The period of carrying out the activities in the municipalities took place during the year 2021, from March to December and the beginning of the year 2022 from March to April. It is important to highlight that the state institutional support process was established with the development of actions and activities through the use of active methodologies, delivery of guiding documents, presentation of proposals for Assistance Flows and Protocols and realistic in-service training, aiming at optimizing and qualification in clinical and care management, in addition to improving health indicators and strengthening Health Care Networks.

Keywords: Institutional support, protocols, flows, Trainings, Health Care Networks.

1 INTRODUCTION

According to Andrade et al. (2014) Institutional Support (AI) proposes, from a new perspective, changes that seek the effectiveness of health practices and the production of groups and health teams in a more solidary way and with co-responsibilities. In this way, it is configured as a way to encourage

participatory management, which is an important instrument for promoting changes in health management and practices, which results in effective and motivating care for work teams. It is important to highlight that the institution and supporters monitor the process of change in organizations, articulating technologies and proposing strategies and searching for ways to operate for the management team.

The Ministry of Health (2010 a) defines as institutional support functions: 1) to encourage the creation of collective spaces, through arrangements or devices that facilitate interaction between subjects; 2) recognize the relations of power, affection and the circulation of knowledge, enabling the viability of projects agreed upon by institutional and social actors; 3) to mediate together with the group the construction of common objectives and the agreement of commitments and contracts; 4) bring to the work of coordination, planning and supervision the qualification processes of institutional actions; 5) to allow groups to exercise criticism and for health professionals to be able to act based on new references, contributing to improve the quality of management in the SUS. Thus, institutional support is configured as a device that expands the capacity for reflection, understanding and analysis of groups, which could thus qualify their own intervention, their ability to produce more and better health with others.

With regard to Health Care Networks (RAS), Mendes (2009) and UFMA (2016) emphasize that they are organized by health care points, which are places where health services are offered and must be strategically distributed. in the territories. In the RAS, the priority door for health care is the Primary Health Care (PHC), which must be able to resolve most of the population's problems, being, therefore, the organizer of care.

of the RAS operational structure are : communication center (Primary Health Care); attention points (secondary and tertiary); support systems (diagnostic and therapeutic, pharmaceutical assistance, telecare and health information); logistical systems (electronic health records, clinical records, systems of regulated access to care and health transport systems); and governance system (of the health care network) (MENDES, 2009; UFMA, 2016).

It is worth mentioning that the guidelines for the organization of Health Care Networks within the scope of the Unified Health System (SUS) were established by the Ministry of Health through Ordinance No. 4,279/10. The networks established in the Ordinance are divided into: Rede Cegonha, established through Ordinance No. 1,459/11 and currently called Maternal and Child Care Network (RAMI) established by Ordinance GM/MS No. 715/2022; Urgency and Emergency Network (RUE), established by Ordinance GM/MS No. 1,600/2011; Psychosocial Care Network (RAPS), established by Ordinance GM/MS No. 3088/2011, for people with suffering or mental disorder and with needs arising from the use of crack, alcohol and other drugs; Care Network for People with Disabilities (Living Without Limits), established by Ordinance GM/MS nº 793/2012; and Health Care Network for People with Chronic Diseases , by Ordinance GM/MS No. 483/2014 (BRASIL, 2010b; BRASIL, 2011a; BRASIL, 2022; BRASIL 2011b; BRASIL, 2011c; BRASIL, 2012a; BRASIL, 2014a) .

Regarding the use of Assistance Protocols and Flows in the work routine, Werneck, Faria and Campos (2009) mention that these instruments are important to face problems in care and service management. They emphasize that these instruments are guided by guidelines of a clinical and organizational nature and are based and validated by studies and scientific evidence, in addition to incorporating new technologies in the services.

In this regard, aiming at the organization of RAS in the State of Amapá, specifically at this moment the Maternal and Child Care Network (RAMI), the Care Network for People with Chronic Non-Communicable Diseases (RDCNT) and the Urgency and Emergency Network (RUE) , it was observed during the accomplishment of a Situational Diagnosis the need to implement Protocols and Assistance Flows, as well as to carry out in-service training for health professionals in the municipalities of Laranjal do Jari, Vitória do Jari, Oiapoque, Cutias do Araguari and Amapá, thus aiming at qualification in the assistance provided to SUS users and the strengthening of the referred Networks in the State.

2 GENERAL OBJECTIVE

Implement Protocols and Assistance Flows of the Networks of Attention to Maternal and Child Health, Non-Communicable Chronic Diseases and Urgency and Emergency in the municipalities of Laranjal do Jari, Vitória do Jari, Oiapoque, Cutias do Araguari and Amapá.

3 METHODOLOGY

The research is descriptive with a qualitative approach of the Experience Report type, which according to Córdula and Nascimento (2018) is considered as a written expression of experiences, capable of contributing to the production of knowledge on the most varied themes.

First, the technical team of the State Department of Health – SESA, through the articulators of the Health Care Networks (RAS) and the management of Primary Health Care, carried out the Planning of the activities to be carried out in the municipalities of the State of Amapá. Subsequently, the team displacement processes and travel and activities schedule were set up.

A situational diagnosis of the RAS was carried out in the municipalities, which identified the main weaknesses and priority problems, which enabled strategic planning with actions directed towards service needs (PANTOJA; CARMO, 2021).

The logistics were organized by SESA and the Municipal Health Departments of the municipalities articulated the space and the convening of primary care professionals for the presentation of proposals and training. It is noteworthy that the displacement of the technical team took place by land and river as necessary to the municipalities.

The period of carrying out the activities in the municipalities took place during the year 2021, from March to December and the beginning of the year 2022 from March to April.

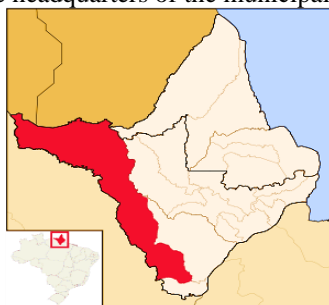
It is important to highlight that the process of state institutional support was established with the development of actions and activities through the use of active methodologies, delivery of guiding documents, presentation of proposals for Assistance Flows and Protocols and realistic in-service training, aiming at optimizing and qualification in clinical and care management, in addition to improving health indicators and strengthening RAS.

4 CHARACTERIZATION AND DEFINITION OF PRIORITIES OF THE MUNICIPALITIES OF LARANJAL DO JARI, VITÓRIA DO JARI, OIAPOQUE, AUTIAS DO ARAGUARI AND AMAPÁ

The municipality of **Laranjal do Jari** is the third most populous in the state of Amapá and has an estimated population of 52,302 inhabitants in 2021 (IBGE, 2021). The IDHM is 0.665, GDP per capita is 18,252.70 BRL. The infant mortality rate in 2019 was 23.2 deaths per thousand live births. The climate is tropical with an average temperature of 27.2 °C. There is significant rainfall in most months of the year. The annual average rainfall is 2244 mm.

The headquarters of Laranjal do Jari is made up of the following neighborhoods: Agreste, Mirilândia , Nova Esperança, São Pedro, Santarém, Sarney, Malvinas, Cajari , Centro, Samaúma , Castanheira, Nazaré Mineiro, Buritizal, Prosperidade, Sagrado Coração de Jesus.

Figure 1 – Map of the headquarters of the municipality of Laranjal do Jari.



Source: Pantoja and Carmo (2021)/ SESA - AP.

The Health Establishments of Laranjal do Jari that are included in the National Registry of Health Establishments (CNES) add up to a total of 26, with emphasis on those belonging to the public administration: 01 Hospital, 01 Emergency Care Unit Size I, 03 Health Posts , 10 UBSs, 01 SAMU Base (inoperative), 01 CAPS I (Hug me), 01 Specialized Center for Municipal Rehabilitation, 01 Clinical Analysis Laboratory, 01 Municipal Cold Network Center and 01 Municipal Imaging Center Maria Alice.

The municipality has 659 health professionals registered in the CNES. It has 20 Family Health Strategy Teams (FHSs) that work in Basic Health Units and territories covered, with 18 FHSs working in the urban area of the city and 02 teams working in the rural zone. In general, the ESFs have a total of 107 Community Health Agents (ACS), in addition to 14 Oral Health teams.

In this regard, it has 100% ESF coverage and 100% Primary Care coverage (e-GESTOR, 2021).

Vitória do Jari , in turn, is a municipality in the extreme south of the state of Amapá. 180 km away from the capital Macapá. It has an area of 2,508,979 km². Access is by land and river. It has an estimated population in 2021 of 16,572 inhabitants. The IDHM is 0.619, GDP per capita is 12,137.17 BRL. The infant mortality rate in 2019 was 10.27 deaths per thousand live births. The climate is rainy tropical. The maximum temperature is 34° and the minimum is around 20° centigrade. The municipality comprises the Vitória do Jari headquarters, the districts of Jarilândia , São João do Cajari and Marajó.

Figure 2 – Map of Vitória do Jari Municipality Headquarters.



Source: Pantoja and Carmo (2021)/ SESA - AP.

The Health Establishments of Vitória do Jari that are included in the National Register of Health Establishments (CNES) add up to a total of 12, with emphasis on those belonging to the public administration: 01 Mixed Unit (State Management), 02 Health Posts, 06 UBSs, 01 Psychosocial Care Center (CAPS I). There is no reference Hospital, Emergency Care Unit, Clinical Analysis Laboratory, Health Academy and Specialized Rehabilitation Center in the municipality.

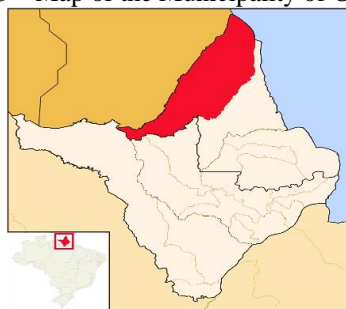
The municipality has 205 health professionals registered in the CNES. It presents as organizational health arrangements: 07 Family Health Strategy Teams that work in Basic Health Units and territories covered. In general, the ESFs have a total of 43 Community Health Agents (ACS), in addition to 06 oral health teams. It is worth emphasizing that the municipality also has 02 Riverside Teams registered, 01 team linked to UBS Aterro do Muriacá and 01 team linked to UBS de Jarilândia .

In this aspect, it has 100% ESF coverage and 100% Primary Care coverage (E-GESTOR, 2021).

The municipality of **Oiapoque** is the only city in Amapá that has an international border – it borders French Guiana, the French Overseas Department in South America. It has an estimated population in 2021 of 28,534 inhabitants. The IDHM is 0.658, GDP per capita is 16,003.40 BRL. The infant mortality rate in 2019 was 6.71 deaths per thousand live births.

The headquarters of Oiapoque is made up of the following neighborhoods: Beira Rua, Centro, Fazendinha, Infraero, Nova Esperança, Nova União, Oiapoquinho , Paraíso, Planalto, Russo, Teles, FM, SESC, Universidade, Vila Vitória, Vitória do Oiapoque. As districts: Clevelândia do Norte recognized area of military detachment of the army and Vila Velha. The following communities are still part of its territory: Ponte do Caciporé , Rio Cassiporé , Vila Brasil, Taperebá and other smaller (indigenous) villages such as: Aldeia do Manga, Santa Isabel, Espírito Santo, Açaizal, Urucaura , Incruzo , Flexa , Kumenê , Kumarumã

Figure 3 – Map of the Municipality of Oiapoque.



Source: Pantoja and Carmo (2021)/ SESA - AP.

The Health Establishments of Oiapoque that are listed in the National Registry of Health Establishments (CNES) add up to a total of 33, with emphasis on those belonging to the public administration: 01 Hospital, 05 Health Posts, 05 UBSs, 01 SAMU Base (inoperative), 01 CAPS I (Espaço Caridar), 01 Frontier Laboratory of Oiapoque (LAFRON) maintained by LACEN, 12 Indigenous Health Centers, 01 Home Health Unit for the Indian (Casai Oiapoque) and 01 Dental Care .

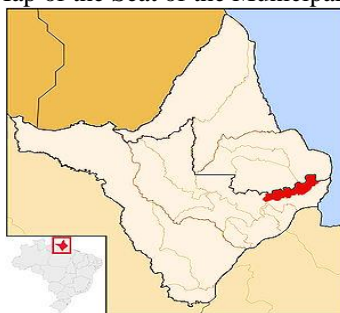
The municipality has 351 health professionals registered in the CNES. It has 06 Family Health Strategy Teams that work in the Basic Health Units and territories covered. In general, the ESFs have a total of 35 Community Health Agents (ACS), in addition to 05 oral health teams.

In this aspect, it has coverage by the ESF of 75.91% and coverage by Primary Care of 88.67% (e-GESTOR, 2021).

With regard to the municipality of **Cutias do Araguari** , it has an area of 2,179,114 km² with a distance of 163 km from the capital Macapá. It has an estimated population of 6,217 inhabitants in 2021 (IBGE, 2021). The IDHM is 0.628, GDP per capita is 12,993.99 BRL. The infant mortality rate in 2019 was 33.33 deaths per thousand live births. The predominant climate is tropical rain, with a short dry period and an average annual temperature never lower than 18 degrees Celsius. The rainfall reaches 2,800 mm of annual rainfall and the relative humidity is around 80%.

The municipality has 19 locations: Cutias (headquarters), Alegria do Araguari, Alta Floresta, Bom Amigo, Bom Destino, Bom Jesus do Araguari, I believe in God of Araguari, Deus Por Nós, Guanabara do Araguari, Gurupora , Jacitara, Liberdade do Araguari , Livramento, Marachimbé , Natal do Araguari, Nova Esperança, Pracuúba do Araguari, Sacred Heart of Jesus, Sacred Heart of Mary, Samaúma , São Paulo do Araguari, São Raimundo and São Sebastião do Pacuí .

Figure 4 – Map of the Seat of the Municipality of Cutias.



Source: Pantoja and Carmo (2021)/ SESA - AP.

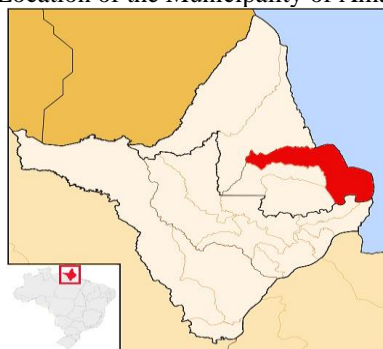
The Health Establishments of Agoutis that are included in the National Registry of Health Establishments (CNES) add up to a total of 10, with emphasis on those belonging to the public administration: 0 Mixed Health Unit, 04 Health Posts, 03 UBSs 01 Health Academy . There is no reference Hospital, Emergency Care Unit, clinical analysis laboratory, CAPS and CER in the city.

The municipality has 127 health professionals registered in the CNES. It presents as organizational health arrangements: 02 Family Health Strategy Teams that work in Basic Health Units and territories covered. In general, the ESFs have a total of 18 Community Health Agents (ACS), in addition to 02 oral health teams.

In this aspect, it has 100% ESF coverage and 100% Primary Care coverage (E-GESTOR, 2021).

Finally, the municipality of **Amapá** is located in the north of the state, 312 kilometers away from the capital. Access is by land, through the BR-156, as well as by sea and air. It has an area of 9,203.50 km². It borders the municipalities of Calçoene (north and west), Pracuúba (south) and Atlantic Ocean (east). It has an estimated population in 2021 of 9,265 inhabitants. The IDHM is 0.642, GDP per capita is 15,202.70 R\$. The infant mortality rate in 2019 was 11.83 deaths per thousand live births. The predominant climate is hot and humid. The maximum temperature is 34 °C and the minimum is 20 °C.

Figure 5 – Location of the Municipality of Amapá.



Source: Pantoja and Carmo (2021)/ SESA - AP.

The municipality of Amapá has the following communities: Amapá (headquarters), Santo Antônio, Vista Alegre, Raimundo, Volcão do Norte, Amapá Grande, Calafate, Piquiá , Cruzeiro, Cachoeira Grande, Sucuriju , Celso, Ilha Grande, Air Base, Paratu and Araguaiçaua .

The Health Establishments of Amapá included in the National Registry of Health Establishments (CNES) add up to a total of 15, with emphasis on those belonging to the public administration: 01 Mixed Unit (State Management), 01 Polyclinic, 06 Health Posts, 02 UBSs, 01 Health Academy Pole and 01 Diagnostic and Therapy Support Service Unit. There is no reference Hospital, Emergency Care Unit, CAPS and CER in the municipality.

There are 234 health professionals registered in the CNES. It presents as organizational health arrangements: 03 Family Health Strategy Teams that work in Basic Health Units and territories covered, with 02 ESF' developing their activities in the urban area of the city (Headquarters) and 01 ESF working in the rural area. In general, the ESF's have a total of 22 Community Health Agents (ACS) and 03 oral health teams.

In this aspect, it has coverage by the ESF of 37.87% and coverage by Primary Care of 37.87% (E-GESTOR, 2021).

Regarding the priorities observed in these 05 (five) municipalities, through meetings with Primary Care professionals, it was found that service needs and priority demands were: reorganization of services and work processes, definition of flows and counter-flows , connectivity of UBS's , modernization of assistance with the implementation of electronic medical records, construction of assistance protocols, training regarding the care of users with chronic non-communicable diseases, pregnant women, children and in urgency and emergency situations.

5 PROPOSALS FOR IMPLEMENTING TECHNICAL INSTRUMENTS IN THE CARE ROUTINE

According to the survey of priorities in the five municipalities, critical nodes and common demands related to the work process of PHC professionals were found, as well as the need to review these processes through new techno-assistance settings in health . In this sense, the RAS team and PHC Management selected Protocols and Care Flows that addressed these demands.

It is important to point out that the instruments presented as proposals are validated by the Ministry of Health and entities such as the Pan American Health Organization, the Brazilian Society of Cardiology, the Brazilian Society of Diabetes, the *American Diabetes Association*, the World Health Organization and States and Municipalities with experiences and successful programs, so adaptations were suggested according to the local reality.

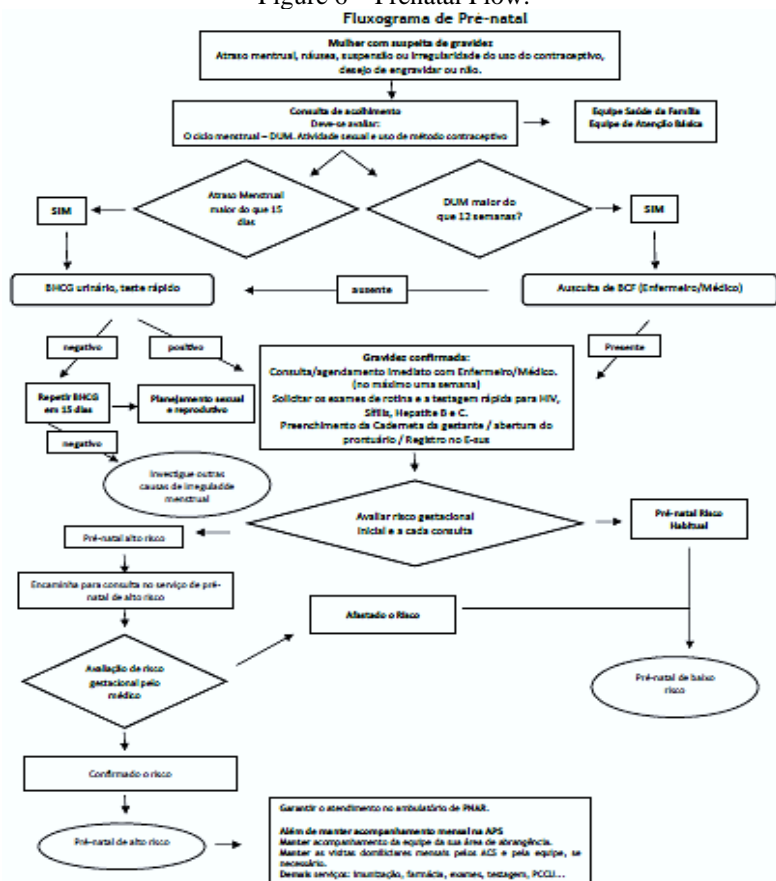
For training, health professionals and the management team of the municipalities received the printed and media instruments for implementation in the care routine. In addition, the SESA team used audio, video and computer equipment as extra resources for content fixation and the use of active methodologies such as gamification (use of the Kahoot[®] Q&A platform), problem tree and concept map .

The professionals who participated in the meetings are part of the PHC multiprofessional team, thus including doctors, nurses, nursing technicians, community health agents, physiotherapists, psychologists,

nutritionists, dentists, directors of Basic Health Units , Program Coordinators and health surveillance agents.

Thus, the Mother and Child Care Network presented the following proposals: the Prenatal Flow (BRASIL, 2012); Child Care Flow (BRASIL, 2009; BRASIL, 2014b; BRASIL, 2015); Primary Care Gestational Risk Classification Form (PIAUI, 2019); Protocols aimed at the Health of Children (Nursing Consultation for Childcare (COLOMBO, 2012) and Consultation Calendar (BRASIL, 2014b)).

Figure 6 – Prenatal Flow.



Source: Adapted from Brazil (2012).

Figure 7 – Gestational Risk Classification Sheet.

CLASSIFICAÇÃO DE RISCO DA GESTANTE NA ATENÇÃO BÁSICA

I - ORIGEM DA PACIENTE:
 UNIDADE DE SAÚDE: _____
 MUNICÍPIO: _____
 DATA DO ATENDIMENTO: ____/____/____

II - IDENTIFICAÇÃO:
 NOME: _____
 CARTÃO DO SUS: _____ Nº DA ESF: _____
 COR: BRANCA () PRETA () PARDIA () AMARELA () INDÍGENA ()
 ESTADO CIVIL: CASADA () UNIÃO ESTÁVEL () SOLTEIRA () DIVORCIADA () OUTRO ()
 ENDEREÇO: _____
 FONE: () _____ DATA DE NASCIMENTO: ____/____/____ IDADE: _____

III - ASSINALE COM CÍRCULO O NÚMERO CORRESPONDENTE A RESPOSTA:

1. IDADE:	PONTUAÇÃO	8. ANTECEDENTES OBSTÉTRICOS	PONTUAÇÃO
< 15 anos	2	Abortos espontâneos < 3	5
de 15 a 19 anos	1	Abortos espontâneos 3 ou mais	10
de 20 a 34 anos	0	1 Natimorto/prematuro/óbito perinatal	5
≥ 35 anos	1	Mais de 1 filho prematuro / natimorto	10
		Cesária 3 ou mais	5
		Pré-eclâmpsia leve	5
		Pré-eclâmpsia grave	10
		Eclâmpsia	10
		Placenta prévia	5
		Descolamento Prematuro da Placenta	10
		Incompetência Ínter Cervical	10
		Restrição de Crescimento Intrauterino	5
		Malformação fetal	5
		Último parto < 12 meses	2
		Intervalo Interparto < 5 anos	5
		Trombose Venosa Profunda/Embolia	10
		Estérilidade/Infertilidade	5

2. RENDA FAMILIAR per capita:	PONTUAÇÃO	9. PATOLOGIAS NA GESTAÇÃO ATUAL	PONTUAÇÃO
Até 1/3 salário	1	1. OBSTÉTRICAS E GINECOLÓGICAS	
2/3 salário	0	Doença Hipertensiva da Gestação	10
		Diabetes Gestacional	10
		Câncer Maligno	10
		Citologia Cervical Anormal (NIC II-III)	10
		Nódulos à palpação mamária	10
		Placenta prévia	10
		Ischemização	10
		Malformações Fetais/ Arritmia fetal	10
		Restrição de Crescimento Intrauterino	10
		Poliâmnio/Oligotamnio	10
		Gêmeos múltiplos	10
		Incompetência Ínter Cervical	10
		Ameaça de Aborto	5
		Anomalia do trato Geniturinário	5

3. Aceitação da GRAVIDEZ	PONTUAÇÃO	4. ESCOLARIDADE - alfabetizada	PONTUAÇÃO
Aceita	0	Sim	0
Não Aceita	1	Não	1

5. HÁBITOS	PONTUAÇÃO
Tabagista	2
Etílico	5
Drogas (cocaína, crack, outras)	10

6. FATOR RH	PONTUAÇÃO
Negativo	4
Positivo	0

7. AVALIAÇÃO NUTRICIONAL	PONTUAÇÃO
Baixo peso (IMC < 18,5 kg/m ²) e/ou ganho de peso inadequado e/ou anemia	2
Peso adequado (IMC 18,5 – 24,9 kg/m ²)	0
Sobrepeso (IMC 25 – 29,9 kg/m ²)	2
Obesidade (IMC > 30 kg/m ²)	5

II. MÉDICAS E CIRÚRGICAS	PONTUAÇÃO
Hipertensão Arterial Crônica	10
Diabetes Mellitus/Endocrinopatias	10
Cardiopatias	10
Pneumonia Grave	10
Doenças Autoimunes (Colagenose, lúpus)	10
Doença Renal Grave	10
Epilepsia/Doença Neurológica	10
Doenças Hematológicas	10
Infecção Urinária de Repetição	10
Infecções Graves	10
AIDS/HIV	10
Hepatite B	10
Tuberculose/Hanseníase	10
Toxoplasmose	10
Alterações Genéticas Maternas	10
Doenças Psiquiátricas	5

CLASSIFICAÇÃO DE RISCO	TOTAL DE PONTOS
Vermelho Alto Risco	≥ 10
Amarelo Médio Risco	De 5 a 9
Verde Baixo Risco	≤ 4
TOTAL	

IMPORTANTE

Fatores socioeconômicos não são critérios isoladamente para encaminhamento ao PNAR¹. Mas, garantem o atendimento diferenciado na Atenção Básica.

ALTO RISCO: somatório de 10 ou mais pontos, encaminhar ao PNAR.

MÉDIO RISCO: somatório de 5 a 9 pontos, atendimento com calendário de consulta diferenciado no PNRH².

BAIXO RISCO: somatório de até 4 pontos, atendimento com calendário de consulta preconizado no PNRH.

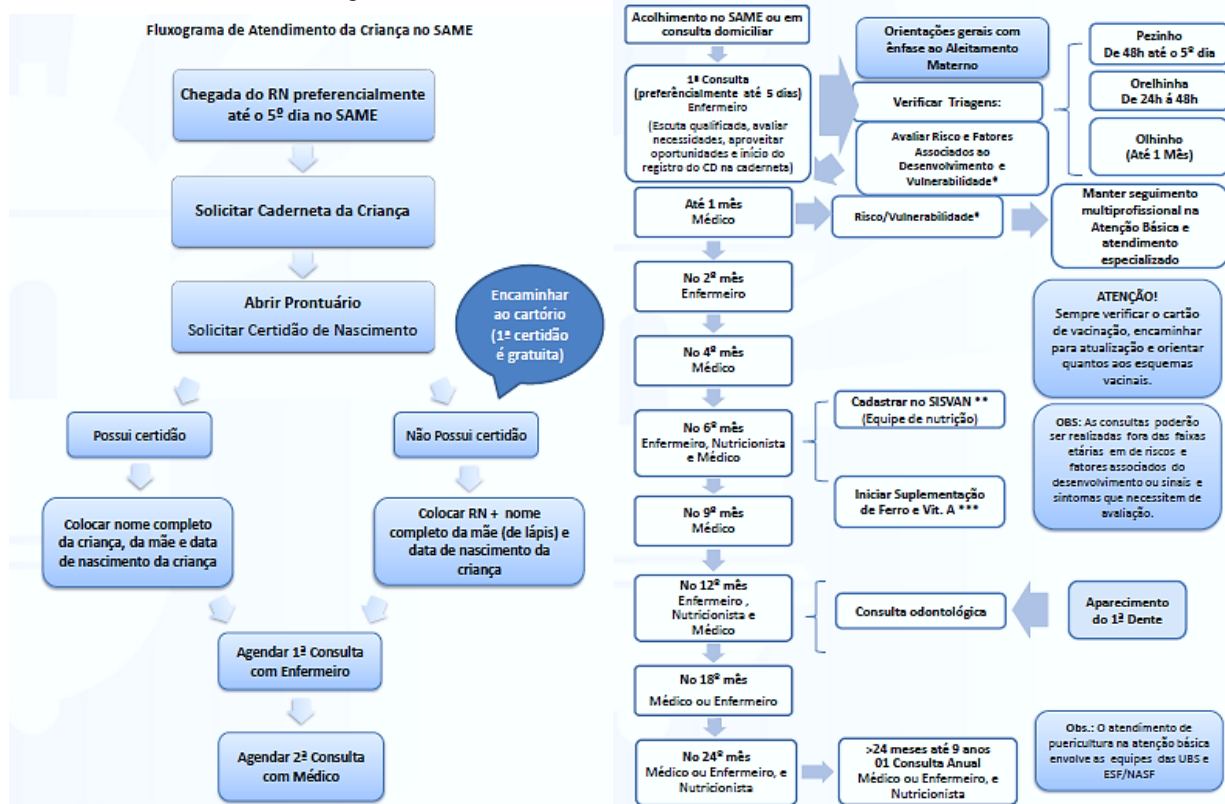
O atendimento no PNRH deve intercalar consultas médicas e de enfermagem.

1. PNAR - Pré-natal de Alto Risco; 2. PNRH - Pré-natal de Risco Habitual

Profissional Responsável
(Assinatura e Carimbo)

Source: Adapted from Piauí (2019).

Figure 8 – Child Care Flow and Consultation Schedule.



Source: Adapted from Brazil (2009), Brazil (2014b) and Brazil (2015).

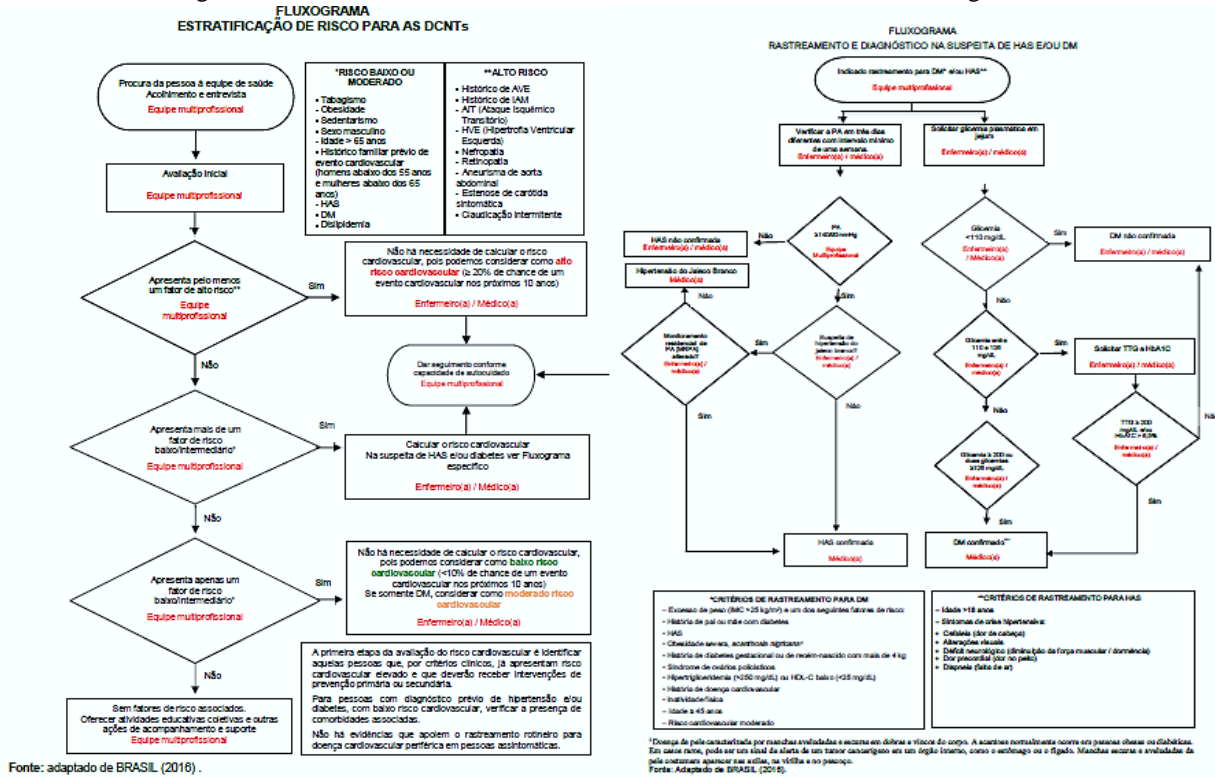
Figure 9 – Childcare Form.

FICHA DE PUEVICULTURA (CONSULTA DE ENFERMAGEM)				
IDENTIFICAÇÃO				
NOME: _____		DATA DE NASC.: ____/____/____		IDADE: _____
NOME DA MÃE: _____		TELEFONE: _____		
ENDEREÇO: _____		SEXY: _____ DATA DO ATENDIMENTO: ____/____/____		
DADOS SOCIOECONÔMICOS E SANITÁRIOS				
DOMICÍLIO	TERRENO	LIXO	FOSSA	ÁGUA
<input type="checkbox"/> MADEIRA <input checked="" type="checkbox"/> ALVENARIA <input checked="" type="checkbox"/> MISTA	<input checked="" type="checkbox"/> ÁREA DE PESSAGUA <input type="checkbox"/> TERRA FIRME <input type="checkbox"/> OUTRO	<input checked="" type="checkbox"/> COLETA PÚBLICA <input type="checkbox"/> INCINERAÇÃO <input type="checkbox"/> OUTRO	<input checked="" type="checkbox"/> NEGRA <input checked="" type="checkbox"/> SECA <input type="checkbox"/> OUTRO	<input checked="" type="checkbox"/> ENCHIMENTO (CAUSA) <input checked="" type="checkbox"/> POÇO ARTESIANO <input type="checkbox"/> POÇO ABANDONADO
ANTECEDENTES FAMILIARES				
<input type="checkbox"/> HAS <input type="checkbox"/> DM <input type="checkbox"/> DOENÇAS CONGÊNITAS	<input type="checkbox"/> CARDIOPATIA <input type="checkbox"/> NEFROPATIA <input type="checkbox"/> CÂNCER	<input type="checkbox"/> TUBERCULOSE <input type="checkbox"/> HANSENÍASE <input type="checkbox"/> DOENÇAS NEUROPSÍQUICAS		
DADOS DO NASCIMENTO				
TIPO DE PARTO		IG: _____	TEMPO DE INTERNAÇÃO: _____	
<input checked="" type="checkbox"/> NORMAL <input checked="" type="checkbox"/> CESÁREO <input type="checkbox"/> HOSPITAL:	<input checked="" type="checkbox"/> FÓRCEPS <input checked="" type="checkbox"/> HUMANIZADO	<input checked="" type="checkbox"/> ÚNICO <input type="checkbox"/> GÊMELAR	<input type="checkbox"/> SEM <input checked="" type="checkbox"/> PRÉ-TERMO <input type="checkbox"/> TERMO <input type="checkbox"/> PÓS-TERMO	<input type="checkbox"/> ESPONTÂNEO <input type="checkbox"/> EPISIOTOMIA
<input checked="" type="checkbox"/> CURETAGEM <input type="checkbox"/> LACERAÇÃO				
PESO: _____ kg ESTATURA: _____ cm PC: _____ cm PE: _____ cm PB: _____ cm APGAR: 1º: _____ 5º: _____				
VACINAÇÃO: <input checked="" type="checkbox"/> BCG <input type="checkbox"/> HEPATITE B <input type="checkbox"/> USO DE MEDICAÇÃO: <input type="checkbox"/> SIM <input checked="" type="checkbox"/> NÃO QUAL: _____				
INTERCORRÊNCIAS				
PARTO: _____		<input checked="" type="checkbox"/> NÃO		
PRÉ-NATAL: _____		<input type="checkbox"/> NÃO		
AMAMENTAÇÃO: <input type="checkbox"/> SIM <input type="checkbox"/> NÃO, MOTIVO: _____				
DOENÇA CONGÊNITA: <input type="checkbox"/> SIM <input checked="" type="checkbox"/> NÃO				
ANAMNESE (CONSULTA ATUAL)				
QUEIXAS: _____				
VACINAÇÃO: <input type="checkbox"/> ATUALIZADA <input type="checkbox"/> ATRASADA, QUAIS/MOTIVO: _____				
ALIMENTAÇÃO: <input checked="" type="checkbox"/> AME <input type="checkbox"/> ALEITAMENTO MATERNO PRÉDOMINANTE <input type="checkbox"/> ALEITAMENTO MATERNO COMPLEMENTADO <input type="checkbox"/> ALIMENTAÇÃO POR FÓRMULA INFANTIL <input type="checkbox"/> ALIMENTAÇÃO COMUM MOTIVO: _____				
USO DE MEDICAÇÃO: <input type="checkbox"/> SIM <input checked="" type="checkbox"/> NÃO QUAL: _____				
TRIAGENS REALIZADAS/ALTERAÇÕES: _____				
<input type="checkbox"/> PEZINHO <input type="checkbox"/> ORELHINHA <input type="checkbox"/> OULHINHO				
PESO ATUAL: _____ kg GANHO/PERDA: _____ Kg ESTATURA: _____ cm PC: _____ cm PE: _____ cm PB: _____ cm				
IMC: _____ ESTADO NUTRICIONAL: _____				
CRESCIMENTO: _____				
DESENVOLVIMENTO: _____				
EXAME FÍSICO				
SINAIS VITAIS: T: _____ °C FC: _____ bat/m R: _____ cm/min PA: _____ mmHg				
PELE E MUÇOSAS: <input type="checkbox"/> NORMOCORADIAS <input type="checkbox"/> HIPOCORADIAS <input type="checkbox"/> ICTERICIA <input type="checkbox"/> OUTROS _____				
CRÂNIO: <input type="checkbox"/> SIMÉTRICO <input type="checkbox"/> ASSIMÉTRICO <input type="checkbox"/> PRESENÇA DE BOSSA _____				
FONTANELA: BREGMÁTICA: <input type="checkbox"/> ABERTA <input type="checkbox"/> FECHADA LANDEIDE: <input type="checkbox"/> ABERTA <input type="checkbox"/> FECHADA _____				
LINFONÓDOS: <input type="checkbox"/> PRESENTES, LOCAL: _____ <input type="checkbox"/> NÃO				
PUPILAS FOTORREAGENTES: <input checked="" type="checkbox"/> SIM <input type="checkbox"/> NÃO SECREÇÃO CONJUNTIVA: <input type="checkbox"/> SIM, ASPECTO: _____ <input type="checkbox"/> NÃO				
ESCLERÓTICA ICTÉRICA: <input type="checkbox"/> DIREITA <input type="checkbox"/> ESQUERDA <input type="checkbox"/> BILATERAL <input type="checkbox"/> SEM ALTERAÇÃO				
PAVILHÃO ALARICULAR: <input type="checkbox"/> SECO E LIMPO <input type="checkbox"/> SECREÇÃO <input type="checkbox"/> COOR FERIDO <input type="checkbox"/> IMPLANTAÇÃO: <input type="checkbox"/> NORMAL <input type="checkbox"/> BAIXA				
NARIZ: <input type="checkbox"/> SECREÇÃO, ASPECTO/COLORAÇÃO _____ <input type="checkbox"/> SECO E LIMPO				
CAVIDADE ORAL COM MONTIAGE: <input type="checkbox"/> SIM <input type="checkbox"/> NÃO FREIO CURTO: <input type="checkbox"/> SIM <input type="checkbox"/> NÃO				
TÓRAX: <input checked="" type="checkbox"/> SIMÉTRICO <input type="checkbox"/> ASSIMÉTRICO				
AUSCULTA CARDÍACA: <input type="checkbox"/> NORMAL <input type="checkbox"/> ALTERAÇÃO _____				
AUSCULTA PULMONAR: <input type="checkbox"/> NORMAL <input type="checkbox"/> ALTERAÇÃO _____				
APALPAÇÃO ABDOMINAL: <input type="checkbox"/> NORMAL <input type="checkbox"/> DISTENDIDO <input type="checkbox"/> ESCAVADO				
MUDDOS HIPOGÁSTRICOS: <input type="checkbox"/> PRESENTE/NORMAL <input type="checkbox"/> EXACERBAÇÕES <input type="checkbox"/> AUSENTES				
COTO UMBILICAL: <input type="checkbox"/> SECO E LIMPO <input type="checkbox"/> SINAIS DE INFLAMAÇÃO/INFECÇÃO				
ÓRGÃO GENITAL: <input checked="" type="checkbox"/> NORMAL <input type="checkbox"/> ALTERAÇÃO _____ PERMEABILIDADE ANAL: <input type="checkbox"/> SIM <input type="checkbox"/> NÃO				
DIURESE: <input type="checkbox"/> NORMAL <input type="checkbox"/> ALTERAÇÃO _____ EVACUAÇÃO: <input type="checkbox"/> NORMAL <input type="checkbox"/> ALTERAÇÃO _____				
REFLEXOS VISÍVEIS				
<input checked="" type="checkbox"/> PREENÇÃO PLANTAR	<input checked="" type="checkbox"/> MARCHA	<input checked="" type="checkbox"/> ROTAOÇÃO DA CABEÇA	<input checked="" type="checkbox"/> GALANT	
<input checked="" type="checkbox"/> PREENÇÃO PALMAR	<input checked="" type="checkbox"/> TÔNICO CERVICAL	<input type="checkbox"/> SUOÇÃO E BUSCA	<input checked="" type="checkbox"/> FUGA	
<input checked="" type="checkbox"/> PROCUA	<input checked="" type="checkbox"/> BABINSK	<input checked="" type="checkbox"/> MOHO		
ORIENTAÇÕES				
<input checked="" type="checkbox"/> TESTE DO PEZINHO	<input checked="" type="checkbox"/> VACINAS	<input checked="" type="checkbox"/> ALEITAMENTO MATERNO	<input checked="" type="checkbox"/> CUIDADOS COM COTO UMBILICAL	
<input checked="" type="checkbox"/> TESTE DA ORELHINHA	<input checked="" type="checkbox"/> VESTUÁRIO	<input checked="" type="checkbox"/> IMPORTÂNCIA DO PROGRAMA	<input checked="" type="checkbox"/> PREVENÇÃO DE ACIDENTES	
<input checked="" type="checkbox"/> TESTE DO OULHINHO	<input checked="" type="checkbox"/> HIGIENE	<input checked="" type="checkbox"/> REGISTRO DE NASCIMENTO	<input checked="" type="checkbox"/> VÍNCULO PAI-MÃE-BEBÊ	
PRESCRIÇÕES				
<input type="checkbox"/> ANTIÉRMICO <input type="checkbox"/> VITAMINA C <input type="checkbox"/> OUTRAS _____				
ENCAMINHAMENTOS				
<input checked="" type="checkbox"/> PEDIATRA <input type="checkbox"/> NUTRICIONISTA <input type="checkbox"/> SALA DE VACINA <input type="checkbox"/> ODONTÓLOGO <input type="checkbox"/> ASSIST. SOCIAL <input type="checkbox"/> OUTRO _____				
FAZORES DE RISCO E				
ALTERAÇÕES DE RISCO				
<input checked="" type="checkbox"/> ANAMNESE DA PRÉ-NATAL INDEVIDUA		<input checked="" type="checkbox"/> IDADE PEQUENA		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO, PARTO DO MASC NUNCA		<input checked="" type="checkbox"/> IDADE ESTÁTICA		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE TERMO		<input checked="" type="checkbox"/> IDADE DO PARTO		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE 2.5KG		<input checked="" type="checkbox"/> IDADE DO NASCIMENTO		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DO PRÉ-TERMO NUNCA		<input checked="" type="checkbox"/> IDADE DE AMAMENTAÇÃO		
<input checked="" type="checkbox"/> DOENÇAS GRAVES COMO TUBERCULOSE, HANSENÍASE, VÍSCERAIS E CONEXAS		<input checked="" type="checkbox"/> INFERIÊNCIA FISIOLÓGICA		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE FÓRMULA		<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE FÓRMULA		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DA HEMAGIÃO DA DISTAÇÃO MENTAL DA FAMÍLIA		<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DA DISTAÇÃO		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE DISTAÇÃO PARA SAÚDE		<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DA DISTAÇÃO		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE JARDIM		<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DA DISTAÇÃO		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE DISTAÇÃO DE DISTAÇÃO		<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DA DISTAÇÃO		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE DISTAÇÃO DE DISTAÇÃO		<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DA DISTAÇÃO		
<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DE DISTAÇÃO DE DISTAÇÃO		<input checked="" type="checkbox"/> FOMENTO NA DISTAÇÃO DA DISTAÇÃO		
PROFISSIONAL RESPONSÁVEL				
INDICAÇÃO CONSELHO				

Source: Adapted from Columbus (2012).

The Care Network for People with Non-Communicable Chronic Diseases presented as implementation proposals: the Flow for NCDs (BRASIL, 2016); Flow for Systemic Arterial Hypertension (BRASIL, 2013; BRASIL, 2016); Flow for Diabetes Mellitus (BRAZIL, 2016); Consultation Guide for CNCD (BRAZIL, 2016); HEARTS Technical Support Package (WHO; PAHO, 2018) containing the HAS Clinical Pathway; Instrument for Cardiovascular Risk Assessment (Framingham Scale) (BRASIL, 2013; BRASIL, 2016); presentation of Applications validated by the Brazilian Society of Cardiology (CardioRisco Framingham 2020[@] and Calculator ER 2020[@]); and Instrument for Assessing Diabetic Feet (ADA, 2015).

Figure 10 – Risk Stratification Flow for CNCD and HAS and DM Tracking Flow.



Source: Adapted from Brazil (2016).

Figure 11 – Assessment Instrument for Diabetic Feet and Applications for Cardiovascular Risk.

Como avaliar os pés dos pacientes diabéticos?
 Teste do toque nos dedos dos pés, ou Ipswich Touch Test



Aplicativos da SBC
 para plataformas Apple e Android

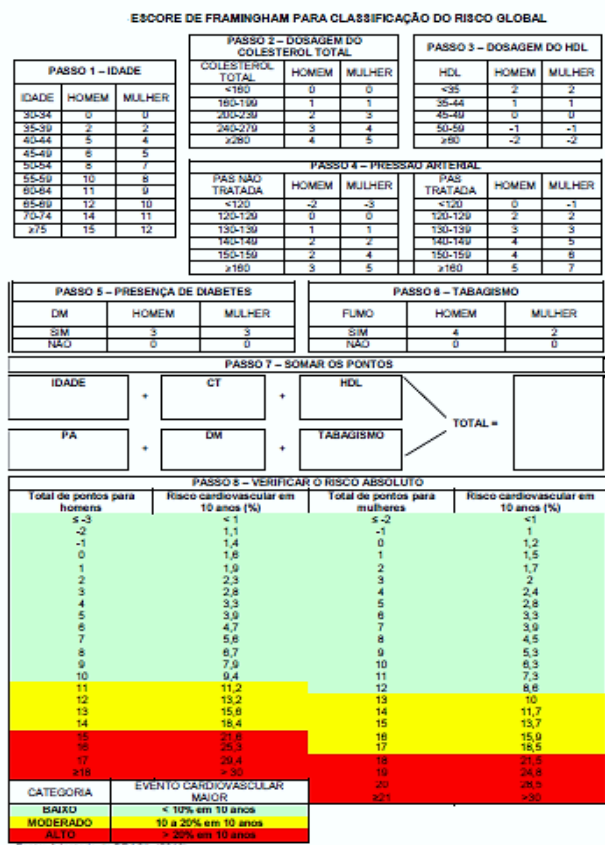
CardioRisco Framingham 2020
 Sociedade Brasileira de Cardiologia

Calculadora ER 2020
 Sociedade Brasileira de Cardiologia

Se o paciente sentir cinco ou seis dos seis toques realizados, sua sensibilidade é normal e não há risco aumentado para problemas nos pés causados por alterações da sensibilidade. Reavaliações anuais devem ser programadas para todos os portadores de diabetes com sensibilidade normal nos pés.
 Se o paciente não sentir dois ou mais dos seis toques é muito provável que sua sensibilidade esteja reduzida, o que pode significar risco aumentado para ulcerações.

Source: Adapted from ADA (2015) and SBC (2020).

Figure 12 – Framingham Scale for Calculating Cardiovascular Risk and Technical Support Instruments from HEARTS – Clinical Pathway of Systemic Arterial Hypertension.



Caminho Clínico da Hipertensão

A MEDICÇÃO PRECISA DA PRESSÃO ARTERIAL
 MEDIR A PRESSÃO ARTERIAL EM TODOS OS ADULTOS E EM TODAS AS VISITAS

1 Não converse
 2 Apoio e braço ao nível do coração
 3 Colocar o braçete no braço
 4 Usar o tamanho do braçete apropriado
 5 Apoio do punho
 6 Apoio do pé

Sempre que possível utilizar dispositivos eletrônicos validados para o PA.

B RISCO CARDIOVASCULAR
 CONHEÇA O SEU RISCO DE DOENÇA CARDIOVASCULAR E TOME MEDIDAS-LO

USAR O HEARTS APP PARA AVALIAR O SEU RISCO CARDIOVASCULAR

Código de digitalização para acessar a calculadora de risco cardiovascular:

Este aplicativo está disponível para download no Google Play.

C PROTOCOLO DE TRATAMENTO
 INICIAR O TRATAMENTO MEDICAMENTOSO APÓS A CONFIRMAÇÃO DA HIPERTENSÃO

Pressão arterial ≥140/90 mmHg em todos os HIPERTENSOS
 Pressão arterial ≥130 mmHg em HIPERTENSOS DE ALTO RISCO
 (Diabetes, doença renal crônica, doença cardíaca, pré-eclâmpsia)

1 Evitar o consumo de álcool

2 Índice de massa corporal entre 16,5 e 24,9

3 Evitar alimentos ricos em sódio

1 MES

2 Paciente fora do alvo após repetição da medição:

1 MES

3 Paciente fora do alvo após repetição da medição:

1 MES

4 Paciente fora do alvo após repetição da medição:

1 MES

Paciente fora do alvo:
Consultar o próximo nível de cuidados

1 Fazer 30 minutos de atividade física diariamente

2 Manter uma dieta saudável

3 Não fumar

Pacientes controlados	Acompanhamento mínimo a cada 3 MESES	Acompanhamento mínimo a cada 2 MESES	Fornecer medicamentos para 3 MESES	Influenza	Vacinação Pneumococos	COVID
Todos os hipertensos	✓		✓	✓	✓	✓
Hipertensos de ALTO RISCO		✓	✓	✓	✓	✓

Source: Adapted Brazil (2016) and WHO and PAHO (2018).

The Urgency and Emergency Network carried out 'in locu' in-service training for: respiratory management in children and adults using a mask-valve set (ambu), supraglottic devices, endotracheal tubes; realistic simulations of cardiopulmonary resuscitation maneuvers, use of equipment (Automated External Defibrillator (AED) and Electrocardiogram); pollution protection measures; handling accidents with venomous animals; handling in situations of choking, bleeding; traumatological emergencies; clinical emergencies and pediatric and neonatal emergencies. For the training, dolls of different sizes, equipment and materials from the local assistance units were used and the professionals also participated in the moments of simulation of the procedures as volunteers.

Figure 13 – Materials and equipment used in urgency and emergency training.



Source: RAS/SESA-AP logbook (2021).

The proposals for protocols and flows presented to the PHC in Laranjal do Jari, Vitória do Jari, Oiapoque, Cutias do Araguari and Amapá provided support both for service managers as a guideline for the implementation of public health policies and for health professionals so that develop the work with more autonomy and resolution in the different ministerial programs and life cycles.

In this aspect, the moments of permanent education planned and conducted by the state RAS according to the weaknesses provided by the Situational Diagnosis, promoted dialogue between professionals and their respective management teams, seeking to build strategies and use innovative practices in care to the user.

Proof of this is the inclusion of applications via ' *smartphone* ' in consultations for the evaluation and monitoring of chronically ill patients, which optimizes the time of care and guides professional conduct based on scientific evidence. The *CardioRisco Framingham 2020 application* [®] and *Calculator ER 2020* [®] , for example, in addition to allowing the calculation of cardiovascular risk, provide information on the platform regarding physical activity, medication and return time for a new evaluation.

The results of the work developed can still reflect positively on the improvement of health indicators, on the degree of user satisfaction, on the quality of care, on the quality of reception and risk classification, on the reduction of waiting time during consultations, on the reduction of referrals to referral services unnecessarily, in reducing the worsening of the conditions, in the reduction of mortality rates and sequelae, in the organization and strengthening of the RAS, in the greater adherence, retention and connection of the user to the services, in the degree of commitment of professionals, in stimulating the

discussions of cases considered complex in the territory through the use of the Singular Therapeutic Project, among others.

The use of care flows as graphic tools of the work process, such as those presented by RAMI and RDCNT, demonstrate the steps to be followed by the professional and user, that is, the sequence and interaction of activities, in addition to creating standard norms for the execution of the processes. It is noteworthy that, when they are implemented, the flows allow professionals to also identify the flaws and weaknesses in the process, seeking to resolve them.

The training by RUE sought to fill possible deficiencies and gaps in the training of professionals on the subject. During the survey of problems in the municipalities, the need for qualification and training for care in urgent and emergency situations was unanimous. Health professionals, even working in PHC, must be prepared to recognize the signs of severity and physiological instability of the patient, aiming at the stability and early intervention of the condition. Due to the geographical distance of some municipalities to the capital Macapá, which concentrates the most complex services, professionals must understand aspects of prevention of risk factors and situations in communities and, if necessary, proceed with the safe transport of the patient. In addition, the professional must know how to use equipment that assists in ventilatory management, monitoring and defibrillation when necessary, preventing the worsening of the condition and death.

6 FINAL CONSIDERATIONS

One of the main actions developed and perhaps the most significant of Institutional Support was to make PHC and its actors see themselves as coordinators and organizers of the Health Care and Care Networks, since all the wear and tear in relation to the various work fronts and the various problems of the territory often lead actors to “put out fire”, restricting the moments of planning, evaluation and monitoring of actions.

Following this assumption, the process of state institutional support was established with the development of actions and activities through the use of active methodologies, health applications used by smartphones, delivery of guiding documents, presentation of Proposals for Flows and Assistance Protocols and training realistic in service, aiming at the optimization and qualification in the management of the clinic and care, in addition to the improvement of health indicators and strengthening of Health Care Networks in Amapá.

In this context, it was possible to promote the reorganization of work processes and establish discussion and connection between the professionals of the multidisciplinary team and the management team, resulting in improvements in communication and more lightness in actions, which began to be shared as an actor understood that their doing is linked to the doing of the other, finding similarities and empathy, and with that the user is once again the main target of actions and care.

It is imperative to highlight the local difficulties with a view to a territory full of peculiarities as they are Amazonian municipalities, one of them borders a European territory, which is the case of Oiapoque, and another with the State of Pará, which is the case of Laranjal do Jari. In view of this, it was of fundamental importance to carry out the Situational Diagnosis of the five municipalities, which made it possible to highlight the main weaknesses faced and on top of that interventions were drawn up with a focus on improving these weaknesses.

Finally, it is timely and opportune to report this successful experience as a moment of sharing ideals and strategies based on scientific evidence, directing services and actions in a “surgical” way due to the urgency required at the moment. In addition to promoting transversality between the actors involved.

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CHAPTER 40

The cacao monoculture and the atlantic forest biome in the municipality of Gandu, baixo sul baiano

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ABSTRACT

The present research aims to study the analysis of the presence of the cocoa crop in the municipality of Gandu, in Bahia's Southern Lowlands, and its interaction with the permanence and use of the dense ombrophile forest, which dominates the Atlantic Forest biome. As a methodology, theoretical and empirical surveys were carried out on phytophysiological diversity, land use and some

species of the Atlantic Forest biome, in addition to cocoa cultivation, according to the conceptions of several authors from different areas of science. Interviews and questionnaires were carried out on the relationship between cocoa production and the forest, field visits to cocoa farms, photographs of the forest, of cocoa cultivation in the municipality and also the identification of species with higher incidence in the landscape, collection of information in a letter topographic and thematic maps of the environment and use of satellite images provided by Google. The results obtained show that most interviewees say that there has been degradation in the vegetation cover of the biome in the last decades, the vast majority of the surveyed public affirms the influence of the witches' broom pest with environmental degradation, they also claim to have worked in cocoa plantations and having contact with genetically modified seedlings, the overwhelming majority claim that the preservation of the forest is associated with the cultivation of cocoa, and that without it, the devastation of the forest was greater for the implantation of other crops such as livestock, bananas and subsistence crops during the broom season -of-witch. The fieldwork, together with the satellite images, show that the forest is quite altered, consisting of several stages of ecological succession, called capoira, capoira and capoeirão and more or less preserved fragments of the native ombrophilous forest in mountainous areas. Exotic shading (cacao-cabruca) is still widely used and considered a sustainable practice. It is concluded that the relationship between cocoa culture and dense rainforest is a common practice and has increased after the partial elimination of witches' broom and genetically modified cocoa seedlings.

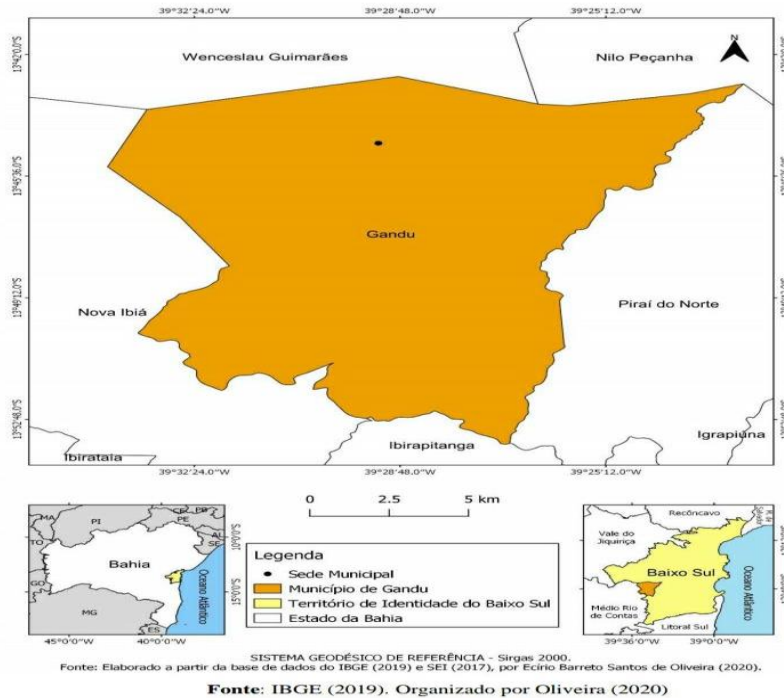
Keywords: Agroforestry, Cocoa production, Atlantic Forest, Phytophysiology, Gandu.

1 INTRODUCTION

The municipality of Gandu is located in the mesoregion of Southern Bahia. Its headquarters are at the 13th coordinate. 74°S and 39°47'W (Figure 1). Its development is directly linked to the cocoa culture (*Theo bromia cacao* L.) in southern Bahia. In 1903, Colonel Barachísio Lisboa was in the present region

observing its geographic, phytogeographic and climatic aspects. It was found to be a humid tropical climate with a rainfall regime without a dry season and dense and leafy rainforests. At the time, the municipality of Gandu was part of the municipality of Santarém.

Figure 1 - Municipality of Gandu - BA



Source: Map made in the Map program View .

In 1907, the first incursions were made by farmers José Amado Costa, Gregório Monteiro da Costa and owners of the first farms that started the construction of the first regional urban centers. The city of Gandu was founded in 1958 and its urban development was due to the cocoa culture due to the potential that the Atlantic Forest has for the production of this culture.

In the study of the Atlantic Forest biome, there are several studies carried out by several researchers and government agencies. One of these surveys, carried out by INPE (Instituto Nacional Pesquisa Espacial) in 2019, shows that the State of Bahia led the ranking of deforestation in the ombrophilous forest with a decrease of 12,228 hectares. It is a serious fact because the Atlantic Forest biome only has 7% of the original vegetation cover left, according to some data from researchers. It can be seen that since the colonization process in Brazil, particularly in the southern region of Bahia, there has been a great degradation of forests and elimination of the biodiversity found initially. Among other factors that involve the creation of regional urban centers, there is the degradation derived from plant extractivism, such as Pau-Brasil, and monocultures such as sugarcane, however the cocoa monoculture has a peculiar aspect. among the others, it needs the shading of larger trees for the management and quality of the cocoa bean , and with that, the economic progression creating a favorable space for such agricultural production.

From the observance of the local phytogeographic aspects, great biodiversity and beauty of the remnants of the original plant cover can be seen. It is noted that the main factor for urban development was based mainly on cocoa agricultural production.

In this perspective, this research comprises the investigation of elements and relationships that permeate the Baixo Sul micro-region of Bahia, specifically, in the municipality of Gandu, among these, characteristics of the local phytophysiology and its influence on the microclimate within the domain of the Atlantic Forest biome and its connection with the cocoa monoculture system in deforestation and preservation of forest biodiversity. Considerations were also made about the historical process of cocoa culture, the colonization of the region and the exploitation of the Atlantic Forest for economic purposes with impacts on the forest, in addition to the regional dissemination of witches' broom (*Crinipellis pernicioso*) from 1989. A case study was also shown on the implantation of the cocoa monoculture, " cacao-cabruca system " and its relationship with local phytophysiological attributes, the relationship of the production of fine beans (select cocoa) with the preservation of the Atlantic Forest, through of the " cabruca method " in that municipality.

The degradation of the Atlantic Forest biome in the municipality of Gandu and its relationship with cocoa production, presents, compared to other areas, a higher rate of environmental preservation given to the agroforestry system " cacao-cabruca ", which consists of the selective cutting of trees for the shading of the cacao crop (understory) within the forest. However, in the 1990s, the disease known regionally as witches' broom (*Crinipellis pernicioso*) brought a time of economic recession, causing the price of almonds to drop a lot. Several producers turned their crops into sawmills or implemented extensive livestock farming, logging activities marked by fires, a time of sustainable setback within the Atlantic Forest biome.

The development of large urban centers and other economic practices in the national territory is noticeable through spatial changes, among them, consequently, the degradation of ecologically diverse environments such as the Atlantic Forest, a historical process spatially registered in the colonization and development of extractive and agricultural practices. The cocoa plantation, despite being conceptualized as a monoculture practice, preserves the Atlantic Forest biome. This culture, as already mentioned, was devastated by the plague of the witches' broom, so named by the producers for the devastation generated mainly in the economy and for the way that it spread throughout the south of Bahia, causing many of the rural workers to degrade crops (fires and deforestation) accelerating the deforestation of the original forest cover.

About this event, Rocha Lourdes, 2008, describes:

Since 1986, this region has been suffering the impacts of a long-term price crisis due to a global overproduction of cocoa. To make matters worse, in 1989, the spread of the fungus *Crinipellis pernicioso*, which causes witches' broom, began to spread. As a result, the crisis deepened, cocoa producers went into debt, plantations were abandoned, and rural and urban unemployment increased. Many municipalities lost population in the 1990s, as was the case of Camacan, among others (Rocha, L, 2008, p.50).

Regarding the human/environment interaction, it can be seen that the practice of cocoa cultivation is based on the principles of partial preservation of natural resources (medium and large fragments of forests of tens of km²) that the Atlantic Forest biome has in the region. This fact contributes to its economic development and also to the permanence of areas with a high level of biodiversity, thus contributing to the functioning of the forest ecosystem. The revitalization of the production and productive value of the almond from the work of the Executive Committee of the Cacaueira Crop Plan (CEPLAC) contributed to the preservation of the forest, highlighting the “ecological method of cabruca ” that partially respects the original forest in the current analysis.

Currently, with a new national and global scenario, CEPLAC is redirecting its mission in order to face the new challenges. The current priority is the recovery of the regional economy, with an emphasis on combating witches' broom, a disease that is decimating cocoa plantations, leaving a legion of more than two hundred thousand unemployed and causing irreparable damage to nature. (Rocha, L, 2008, p.58).

2 METHODOLOGY

To carry out the research, the following methodological procedures were adopted: studies and theoretical surveys and field work on phytophysiognomic diversity , land use and some species of the Atlantic Forest biome, in addition to the cocoa crop. Regarding the cocoa culture, interviews were carried out and questionnaires were applied to the producers of the culture and their relationship with the forest. The initial data collection was carried out through a bibliographic research such as books, articles, theses, dissertations, etc. All this material used was of a varied theme, such as cocoa production in the Bahia South Lowlands, Atlantic Forest biome, phytophysiognomies, flora, historical process of occupation of the region, formation of the municipality of Gandu, the interaction of cocoa production with deforestation and preservation of the native biome, in addition to a survey of the physical environment based on topographical maps and environmental themes, such as climate, geology, topography, geomorphology, soils, potential for use of renewable natural resources and plant cover.

As guiding axes, questions were used to identify the interviewee (gender, age and schooling), questions for the characterization of the degraded biome and residents' impressions about changes in the plant landscape, a case study on the relationship between cocoa production and the implementation of " cocoa-cabruca systems ” and “total clearing system” introduced by the Executive Committee of the Cocoa Crop Plan (CEPLAC), and economic practice of the cocoa crop.

After these observations, a face-to-face monitoring of cocoa farms in the municipality of Gandu was carried out, as a characterization of species with the highest incidence of landscapes with herbaceous vegetation and forest edges through the Planet application . This is based on a worldwide catalog of species identified in the field by a wide range of botanical researchers and other scholars in the area. The application immediately presents the most likely species, but it is necessary to have a prior knowledge of taxonomy, ecology and biogeography of the species that is intended to be identified in the landscapes that comprise

the Atlantic Forest biome. Topographic maps and thematic maps from the RADAMBRASIL Project (1981) (scale 1:100,000 and 1,000,000) were used in the study of the topography, together with images provided by satellite images provided by Google.

Different types of areas in the municipality or land use were considered, such as pastures, capoeirinha (vegetation up to 3 meters), capoeira (vegetation up to 5 meters high), capoeirão (vegetation around 15-20 m) and forest areas. dense ombrophilous with species of remaining trees of the primary forest up to 50 meters (emergent trees), in addition to trees that make up the forest canopy (up to 30 meters). (ANDERSON, et al . al - 1979; VELOSO, FILHO & LIMA, 1992; NOBREGA, MA – 1993). Also areas with cocoa plantations that make up the forest understory in consortium with other cultures (banana, rubber tree), areas with a greater degree of degradation due to local economic practices such as cattle raising.

The classes were not delimited in the satellite images, only texture and shape patterns were observed in the images, then checked in the field with the help of a GPS and an application called “ My Elevation ”. This consists of locating the place with the geographic coordinates and nearby areas with tens of km² and altitude of the place. The altitude of the field of view of the images is 2.3 km high, and the images are from the year 2019.

Interviews and questionnaires were carried out with 100 residents in different parts of the municipality of Gandu, including local farmers, small producers, owners of cocoa shops and agricultural technicians from the Executive Committee of the Cocoa Crop Plan (CEPLAC), questionnaires were distributed in order to understand cocoa production and interaction with the forest. The action of the revitalization plan (combating witches' broom, generation of cloned cocoa seedlings and grafting) of the crops was also verified, which contributes to the permanence and not total degradation of the native forest.

Regarding the flora table, it was presented in two, one shows the native arboreal flora in the Atlantic Forest biome, and the other, pioneer species found in pastures and forest edges. The tables show the family, the scientific name of the species and a common name best known in the region, in addition to the way of life according to VELOSO, FILHO & LIMA (1992). Scientific names are according to the organization *World Flora Online (WFO - 2021)* .

3 RESULTS AND DISCUSSIONS

An important result observed in the field work was the degradation of the forest, deforested areas with cities, villages and pastures. Environmental degradation is characterized by the loss of the environmental potential of a given area or even a geographic unit such as a biome, so the capacity and natural recovery time are overcome by the impacts caused by man. The field work showed that in the area of the municipality of Gandu the vegetation is secondary and degraded mainly in flat and gently undulating topography. In the strongly undulating and mountainous areas, on the summits and steep slopes, the vegetation is more preserved. The fact that steep areas are less degraded is due to the difficulty of occupying

these areas, either because of the steep slope or because of the shallow soils making agriculture difficult. (NOBREGA, MA & VILAS BOAS, AM , 2020).

Degradation in the municipality of Gandu was initiated by the colonizers, exploitation of natural resources for human occupation, deforestation for the implementation of agricultural practices, cattle raising and fires permeate the history of the region. The use of wood from trees for the implementation of sawmills or even its use for firewood in the process of preparing cocoa beans for trade, loss of quality and quantity of water due to the continuous use of fertilizers by agricultural producers in general. Contamination of water, loss of volume of rivers due to deforestation, consequently the silting of rivers and the decrease of the water table and aquifers.

For the Ministry of Environment – MMA (2016), the main environmental problem is deforestation (67%). The other main environmental concerns are: water pollution (47%); air pollution (36%); increase in solid waste generation (28%); water waste (10%); ozone layer (9%); and climate change (6%); among other aspects mentioned less frequently. (Pereira, 2017, p.3).

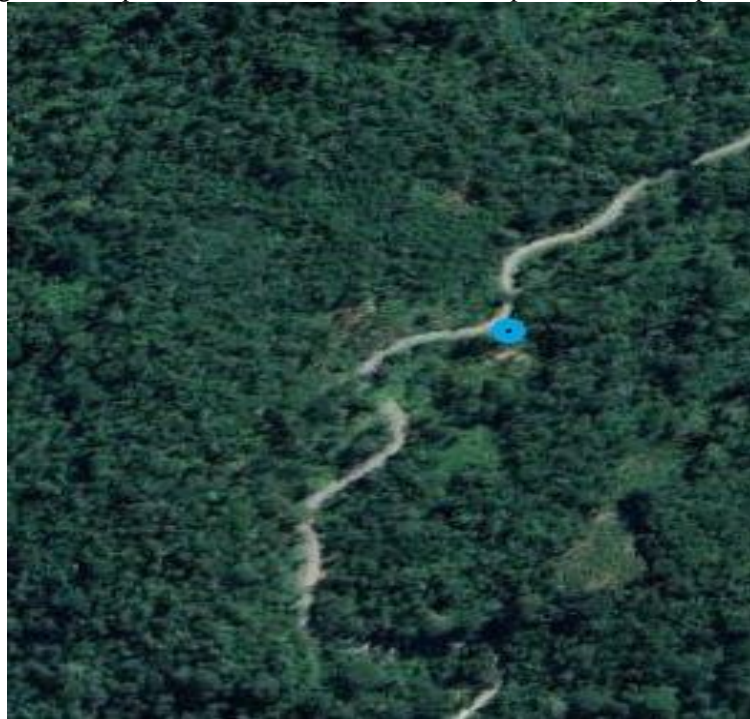
This whole process contributed to the de-characterization of the biome in terms of phytophysionomies and areas occupied by them, making the Gandu region very fragmented, in addition to the loss of local biodiversity, the habitat of several species of fauna and flora, mainly endemic ones. (Figures 2 and 3). The removal of vegetation cover also contributes to the increase in temperature, since there is a loss of moisture released by evapotranspiration. It was also observed the silting of the Gandu and Alma river beds that cut through the municipality and adjacent areas.

Figure 2 - Degraded area with pastures, capoeirinha and capoeira.



Source: Google Earth Pro (2021).

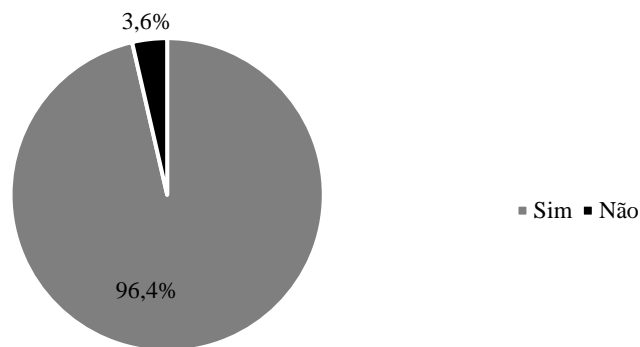
Figure 3 – Capoeira and remnants of dense ombrophilous forest (capoeirão).



Source: Google Earth Pro (2021).

Regarding the questionnaires carried out with the residents about their perception of the changes in the landscape comprised by the Atlantic Forest biome, the following results were obtained:

Graph 1- Changes in the landscape in recent years/decades.



Source: Field survey, 2021.

Currently, the Atlantic Forest biome covers only 12.4% of its original extension (INPE, 2019) resulting from a succession of environmental impacts since the colonizer's contact with the landscape potential found. In this scenario, the current environmental profile is a mosaic of fragmented areas of forest that in some places form ecological corridors, pastures, villages, subsistence crops and cocoa. It is necessary to increase the number of forest environments that resist human activity. The fragments vary greatly in size, some of tens of km², others of a few hectares. The smaller the fragment, the greater the edge effect, observed in the presence of species collected such as certain lianas, epiphytes and pioneer species (Table 1).

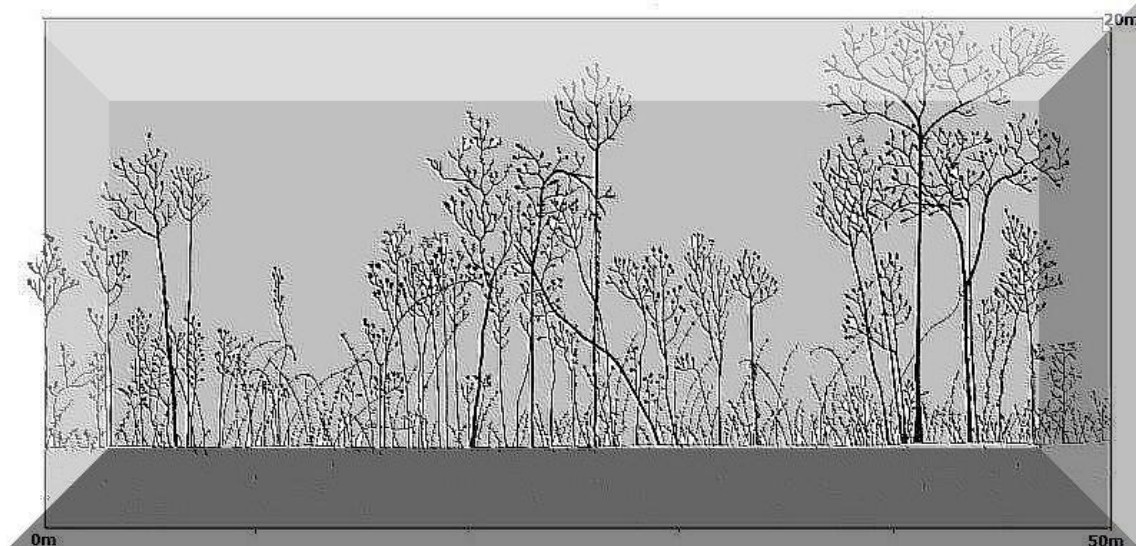
Table 1 - Pioneer and epiphytic species

FAMILY	SPECIES	VULGAR NOME	HABITAT
Bromeliaceae	<i>Nidularium billbergiodes</i> (Shult and Shult.F)	Bromeliads	Herbaceous carpet
Verbenaceae	<i>Lantana triphobia</i> (L)	Fruit of cricket	Aerial epiphytes
Poaceae	<i>Bothiochloa ischaemun</i> (L.) Why	bluestem attachment	Herbaceous carpet
Cyperaceae	<i>Cyperus esculentis</i> (L)	juncinta	Herbaceous carpet
Violaceae	<i>Rape worships</i> (L.)	violet	Herbaceous carpet
Leguminoseae	<i>Mimosa pudica</i> (L.)	dormideira	Herbaceous carpet
Apiaceae	<i>Heracleum sphondylium</i> (L.)	Canabras	Herbaceous carpet
Poacea	<i>Digitaria sanguinalis</i> (L.) Scop .	Capim mattress	herbaceous carpet
piperaceae	<i>piper hispidum</i> sw –	jaborandi	Forest edge (Liana).

Source: Fieldwork, Planet and World Flora Online (WFO) – 2021.

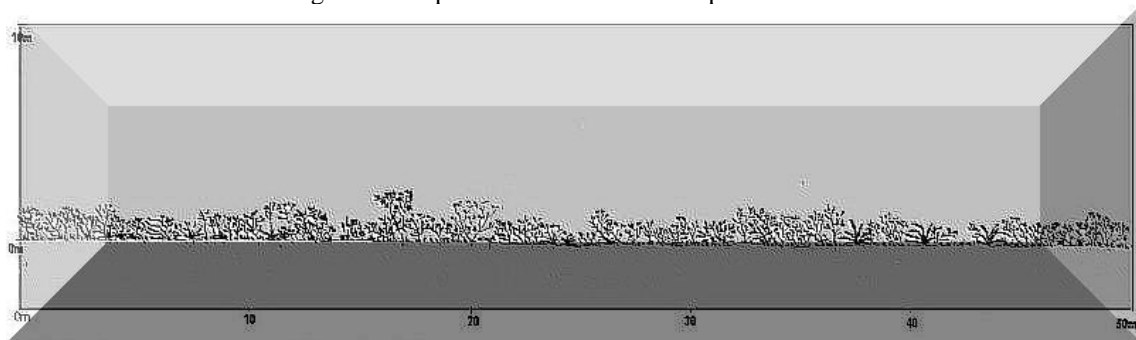
These fragments are quite altered in their physiognomy as can be seen in Figure 5, where it is possible to see some life forms such as chamaephytes, nanophanerophytes, but mainly microphanerophytes. In some places the vegetation is in its initial phase of regeneration called capoeirinha by the locals, that is, they are pioneer species of the Atlantic Forest and also cosmopolitan species. These are mainly nanophanerophytes and chamaephytes (Figure 6). Law nº 11.428 defends the preservation of the Atlantic Forest, corroborating the need to implement conservation units U.C's, for the preservation of native species and also to serve to maintain the functions of the ecosystem, although partially.

Figure 4 – Canopy of dense ombrophylous forest.



Source: NOBREGA, 2003.

Figure 5 – Capoeirinha of dense ombrophilous forest.



Source: NOBREGA, 2003.

There are no precise data on the total diversity of plants in the Atlantic Forest, however, considering only the group of angiosperms, it is believed that Brazil has between 55,000 and 60,000 species, that is, 22% to 24% of the total that esteem to exist in the world. Of this total, the projections are that the Atlantic Forest has about 20,000 species, that is, between 33% and 36% of those existing in the country. Some of these species can be seen in Table 2.

Despite all the efforts made to conserve biodiversity, Grandi et al. (2014) warn that it must be understood that biodiversity goes beyond the fragmented view of each of the structural axes (species, genetics and ecological), as it is not a simple catalog of genes, species or environments, but the result of the dynamic interaction between these three hierarchical levels. Analyzing the concept more deeply, it is noted that this dynamic highlights the genetic fluctuations between species along with variations in the environment in which they live, that is, it explains, in a way, the evolutionary processes related to the diversification of species and ecosystems. (Pereira, 2017, p.4).

Table 2 – Some Atlantic Forest tree species found in Gandu.

FAMILY	SPECIES	COMMON NAME	LIFESTYLE
Lecythidaceae	<i>Cariniana legal</i> (Mart .) Kuntze	Jequitibá	macrophanerophyte
Moraceae	<i>Ficus Insipid</i> (Willd)	Gameleira	Mesophanerophyte
Fabaceae	<i>Erytrina verna</i> (Vell)	Allethrin	Mesophanerophyte
Bignonecea	<i>Tabebuia chrysotricha</i> (Mart . Ex A.DC.)	Duck	Mesophanerophyte
Rutaceae	<i>Balfourodendron riedelianum</i>	Guatambú	Macrophanerophyte
Anacardiaceae	<i>Myracrodruon urundeuva</i> German	Aroeira Preta	Mesophanerophyte
Fabaceae	<i>Bauhinia forficata</i> Link	Pata-de-Vaca	Microphanerophyte
Fabaceae	<i>Caesalpinia Echinacea</i> Lam .	Pau-Brasil	Mesophanerophytes
Meliaceae	<i>Cedrela fissile</i> Vell	Cedar-rose	Macrophanerophyta
Fabaceae	<i>Caesalpinia ferrea</i> C. Mart	Pau-iron	Mesophanerophytes
Fabaceae	<i>Peltophorum doubt</i> (Sprang .) Taub .	Canafistula	microphanerophyte
Bignoniaceae	<i>Rosewood micrantha call</i> –	cabobo	microphanerophyte
malvaceae	<i>Luehea divaricate</i> Mart .	Little horse whip	Mesophanerophyte
Myrtaceae	<i>psidium cattleianum</i> Mart & Zucc .	Araçá-rosa	microphanerophyte
Boraginaceae	<i>Hearts proud</i> Cham .	Baba-de-boi	Microphanerophytes
Boraginaceae	<i>Hearts ecalyculata</i> Vell _	Beard-of-the-bug	Microphanerophytes
Lauraceae	<i>Ocotea velutina</i> (Nees) Rohwer	Canelão	Microphanerophytes
Lauraceae	<i>ocotea puberula</i> (Rich .) Nees ;	aloe cinnamon	microphanerophyte
Arecaceae	<i>Euterpe edulis</i> Mart .	palmito-jussara	Mesophanerophyte

Source: Fieldwork and World Flora Online (WFO) - 2021

The relationship between cocoa plantations and dense ombrophilous forests is more than an agricultural practice, it is a crop or agroforestry system. The first system implemented was the “ cacao-cabruca ” or exotic shading system, which contributed to a better evolution of cocoa plants, soil conservation, in addition to the meso and microclimatic elements, favoring greater humidity in the region due to the great evapotranspiration that occurred in the rainforests. dense degraded vegetation, found in the municipality of Gandu (Figure 7). The circulation of humid air masses coming from the Atlantic Ocean is the main factor for the abundant rainfall in the area, around 1,700 mm/year, essential for production, since cocoa is endemic to the Amazon biome.

The main determinant of the distribution of plant formations in the Atlantic Forest domain is certainly the macro-climate (tropical and humid), influenced by the relief, by the proximity of the sea, by the predominant pattern of circulation of coastal air masses from east to west and by the ocean currents of the South Atlantic, which move predominantly counterclockwise, that is, from the equator to the south along the Brazilian coast, redistributing heat. Therefore, the latitudinal variation in temperature is subtle, but relevant when added to interiorization or altitude. Thus, in the southern portion, starting from the State of Paraná, temperatures drop a lot in the interior plateaus and favor the mixed ombrophilous forest, with a predominance of pine - do - paran , while the Atlantic Forest is compressed even more in the narrow coastal strip towards to Rio Grande do Sul. (Frank et al , 2005, p 49).

Figure 6 – Cocoa plantation in the midst of degraded dense ombrophilous forest.



Source: Field survey, 2021.

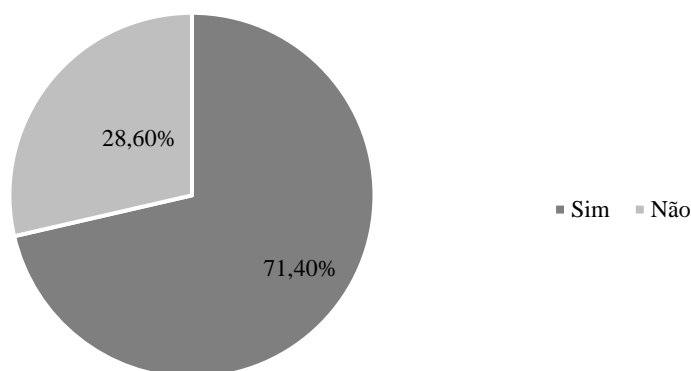
Empirical knowledge about cocoa production in the municipality of Gandu and region, above all, knowledge about the relationship between the forest and cocoa farming is not so widespread. Despite the “

cabruca-cabruca system ” being a less aggressive practice for the biome, the issue of environmental preservation in the region is little addressed, this is a problem in the short and long term. Many producers, despite using native tree shading, fight ecological regeneration by cutting down trees. It is also necessary to take into account the fires for the creation of pastures, a situation intensified with the spread of the witches' broom plague from 1989 onwards, causing a crisis not only economic but also environmental, since it was necessary to resort to other sources of income, such as livestock.

Since 1986, this region has been suffering the impacts of a long-term price crisis due to a global overproduction of cocoa. To make the situation worse, in 1989 the spread of the fungus *Crinipellis pernicioso* , which causes witches' broom, began to spread. As a result, the crisis deepened, cocoa producers went into debt, plantations were abandoned, and rural and urban unemployment increased. Many municipalities lost population in the 1990s, as was the case of Camacan , among others (Rocha, L, 2008, p. 50).

Regarding the guideline that seeks to assess the interviewees' knowledge about the relationship between cocoa production and the Atlantic Forest, 71.4% of them report not understanding this process, while 28.6% understand the agroforestry interaction, as shown in Figure 7. .

Figure 7 - Relationship between cocoa production and the Atlantic Forest.

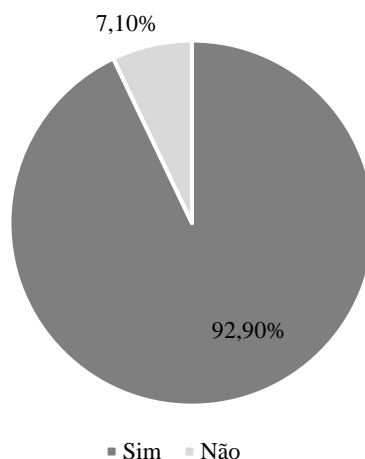


Source: Field Survey, 2021.

Despite the implementation of agroforestry systems such as “ cabruca cocoa ” being less aggressive to the biome, the occurrence of devastation of crops due to the witches’ broom fungus contributed to the deforestation of native areas for the use of other crops such as livestock, the use of wood, bananas and subsistence crops. On many occasions the wood is used to make fences, rafters and slats for the structure of houses or even its use for firewood in cocoa roasting and implementation of sawmills. The preservation of already fragmented areas of the Atlantic Forest biome is of paramount importance for their permanence, in addition to the conservation of biodiversity, habitats for endemic species of fauna and flora.

The witches' broom plague devastated the entire cocoa region, contributing to the destruction of crops, the decline of the regional/local economy and mainly to the deforestation of forest areas. On this topic, 92.9% of the public affirms the pest's influence on environmental degradation. (Figure 8)

Figure 8 - Relation between deforestation and witches' broom.



Source: Field Survey, 2021.

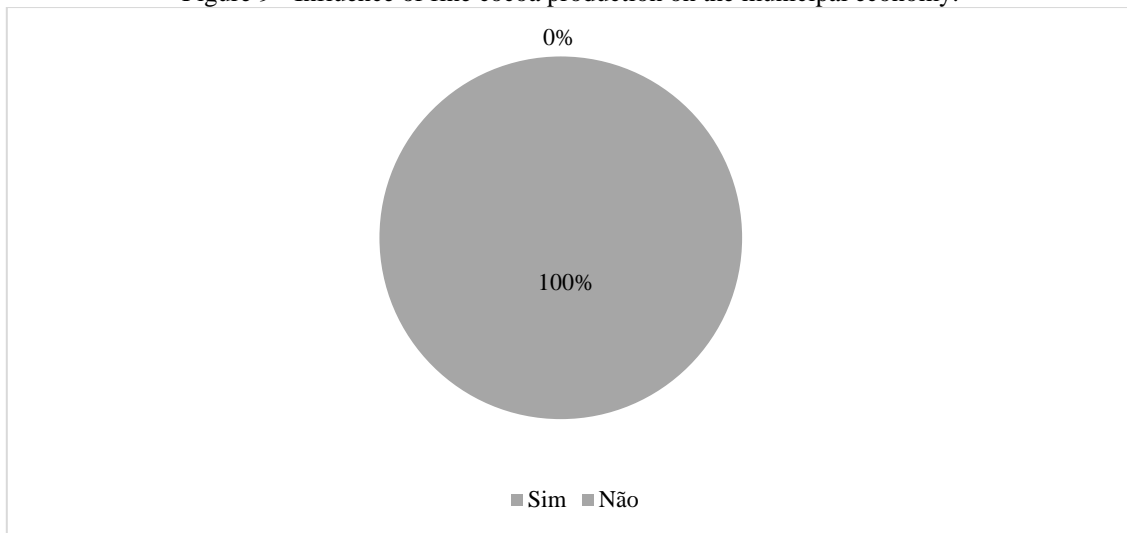
Since the implementation of CEPLAC in the revitalization of cocoa plantations in 1957, there has always been a concern to ensure that the beans reach the final consumer with a competitive quality standard in the international market, as it is known as "fine cocoa", which is part of the plan of the Executive Committee of the Cocoa Crop Plan for the economic reintegration of the cocoa region from the 1990s.

Currently, with a new national and global scenario, CEPLAC is redirecting its mission in order to face the new challenges. The current priority is the recovery of the regional economy, with an emphasis on combating witches' broom, a disease that is decimating cocoa plantations, leaving a legion of more than two hundred thousand unemployed and causing irreparable damage to nature. (Rocha, L, 2008, pg 58).

The "fine cocoa" has extreme value, being highlighted by Rocha (2008) a price that varies from 75% to 100% higher than the price of the common cocoa bean, this is a very important data for the regional economy, because cocoa is still it is the main agricultural product of many municipalities, such as Gandu.

The relevance of the relationship between fine cocoa and the revitalization of crops (production) was expressed by 100% of respondents. (Figure 9)

Figure 9 - Influence of fine cocoa production on the municipal economy.

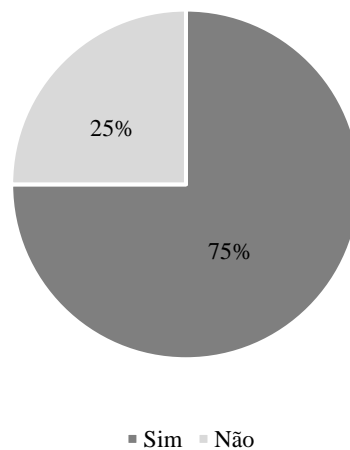


Source: Field Survey, 2021.

The survey carried out in the field reveals that 64.3% of respondents work or have had some contact with cocoa production, this data points to the reality of people who provide the interface of cocoa farming with the Atlantic Forest biome, the practice of production under the exotic shading says a lot about the conservation of the dense rainforest that dominates the region. The search for agroforestry systems is an alternative for the valorization and regional economic diversification as well as the preservation of already degraded areas with a high rate of biodiversity.

The relationship between the agroforestry systems used in the municipality plays an important role in the partial conservation of the biome, as it uses the structure of the dense ombrophilous forest for the implantation of cocoa in the understory of the forest. In this survey, it was reported that 75% of respondents recognize the importance of partial preservation of the forest using cocoa cultivation, while 25% do not understand this relationship. (Figure 10)

Figure 10 - Relationship between cocoa production and preservation of the Atlantic Forest biome.



Source: Field Survey, 2021.

The interface of cocoa farming with the Atlantic Forest biome, the practice of production under exotic shading says a lot about the conservation of the dense rainforest that dominates the region. In this scenario, the search for a balance between production and conservation can be achieved through the implementation of agroforestry systems. These provide soil recovery for agricultural and livestock development, socioeconomic and sociocultural production and environmental preservation, thus the management of agroforestry should also trigger the economic strengthening of local/regional farmers as well as the expansion of production and diversification of agricultural products in association with the preservation of biodiversity in the domain of the native biome promoting sustainability. This production system can positively contribute to the revitalization of crops and preservation of the genetic bank that is under threat, making it as similar as possible to the local ecosystem in structure, composition and functionality (Aquino, 2015).

Some residents report the agroforestry relationship between cocoa production and the forest, addressing the influence of the pest with environmental degradation in the deforestation process, the modernization of production with the development of genetically modified seedlings that results in the evolution of a product that is more resistant to pests and with the greatest potential for participation in the competitive market, fine cocoa. The revitalization of crops can contribute to an economic restructuring of the municipality of Gandu, but also foster the issue of preservation or less intensive practice in the aforementioned biome. Despite the great fragmentation of the biome in the municipality of Gandu, there are still forest reserves and biodiversity that are associated with exotic shading (cacao-cabruca) that is still widely used, causing part of the native forest to be preserved. The degree of preservation can be optimized with the adoption of an agroforestry system that conserves the soil, is more resistant to pests through forest diversification and conservation of dense rainforests.

4 FINAL CONSIDERATIONS

It can be concluded that the Atlantic Forest biome in the municipality of Gandu is very altered and degraded as a result of a series of anthropic impacts, among them, it is worth mentioning deforestation due to the expansion of agricultural practices, pastures for livestock, and use of wood from large native trees for various purposes. Other problems were found in reports by former residents, such as loss of water quality and quantity due to the continuous use by agricultural producers, loss of river volume due to deforestation and the decrease in the water table.

These facts contribute to the de-characterization of the Atlantic Forest biome since the beginning of the exploration of the landscape potential and natural resources by the colonizers that caused environmental impacts and are still happening. The spatial structure of the forest found is a set of fragmented areas of different sizes. These areas form important points to maintain basic ecosystem functions and maintain forest biodiversity, conserving fauna and flora gene banks. These fragments are considered as Atlantic Forest biodiversity hotspots by some researchers, despite the forest being degraded and fragmented.

Relating the issue of cocoa production with the issue of environmental preservation of the Atlantic Forest biome, agroforestry systems (SA F's) act in the interaction between agricultural/livestock development, local socioeconomic development and environmental conservation. Despite the presence of the “ cacao-cabruca agricultural system ” in the municipality acting less aggressively, many producers remove native trees from the forest canopy and also emerging trees, saying that ecological competition can be harmful to production. Because of this, another non-exotic shading system was adopted , such as the shading by the consortium with the banana tree, which exposes the cocoa trees to a stronger degree of solar radiation, to which the cocoa does not present so much resistance, as evidenced in the research of field held.


Exuberant landscapes were seen that provided a reflection of how complex and extraordinary nature is in the region. The biodiversity and landscape potential found tells the story of geological eras, but also carries the story of a people who have a very strong relationship with the land in terms of cocoa culture. The interaction between man and the environment, within this analysis, must be mediated by agroforestry systems that provide both the conservation of native ecosystems and the optimization of cocoa production in Gandu. From the bibliographic and empirical studies, it is concluded that agroforestry systems are the best solution for the economy and less aggressive to the rainforest ecosystem.

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CHAPTER 41

Experimental Disciplines: Challenges Faced by Teachers and Students of the Licenciature Course at the Federal Institute of Education, Science and Technology of Piauí

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ABSTRACT

Chemistry is the science that studies the transformations that involve matter and energy, based on experimental practices of the concepts that are addressed in the classroom. With the COVID-19

pandemic, education took new directions towards technologies, due to the need to continue with classes even in extreme periods, educational didactics involving the use of technologies had to be adapted both to the educator and the student, making them both adhere to remote teaching. In the classes referring to the experimental chemistry practices, the chemical experiments were carried out through remote classes, which caused an effect of astonishment on the teachers and students, who had to adapt these activities to the imposed and necessary contents of the curriculum of the chemistry course. to the virtual world, so numerous challenges arose during this process. Therefore, this article will address, through the verification of data analysis of a questionnaire aimed at teachers and students, the main challenges faced in practical chemistry classes during this period of pandemic, making a comparison with practical classroom classes, concluding that there were advantages and disadvantages in this process.

Keywords: Experimental discipline of chemistry, remote classes, covid-19, challenges- teacher/student.

1 INTRODUCTION

On December 31, 2019, the World Health Organization (WHO) was alerted to several cases of pneumonia in Wuhan City, Hubei Province, People's Republic of China. It was a new strain (type) of Coronavirus that had not been identified before in humans. People around the world were forced to isolate themselves in their homes in search of protection against the Coronavirus, thus starting a global pandemic. With social isolation, teaching units were closed, and the process of distance education began in public and private schools. At the Federal Institute of Piauí- Campus Picos, the distance education process had a great impact on teaching-learning; in the higher education course of Chemistry, for example, some of the disciplines in which this impact was felt by both professors and students was especially in the experimental disciplines of chemistry, with a great process of changes and adaptations on their part.

One of the adaptations experienced by teachers and students was related to the use of electronic devices such as the cell phone or notebook as the main means of interaction to watch the classes and the complementary videos available on the youtube platform, which contained in them some experiments on

the subjects passed on during the classes. classes and also the realization of practices elaborated at home with simple materials. This was one of the main methods used by teachers to alleviate the lack of face-to-face classes. However, not all students had access to the use of these devices, and not even teachers and students were so familiar with the technologies, resulting in a great challenge for everyone.

According to the author, also Fernandes, (2021. apud CARVALHO. 2022 P.14) in this way, an even greater degree of difficulty in the teaching and learning process was attributed to the pandemic, mainly due to obstacles related to the access and use of technologies , as well as adapting to a new teaching scenario. This adhesion was seen as the only alternative for the continuity of teaching, so that even more time was not lost in the skill in relation to learning.

Since then, the percentage of student performance in these remote chemistry laboratory experimental classes, in which teachers observed changes in school performance, compared to face-to-face classes, this performance was unsatisfactory. There was also a certain difficulty for the students in relation to having direct contact with the teaching professors of the experimental classes in the chemistry laboratory, such as clearing up doubts about elaborating experiments at home that were previously carried out as a team in the laboratory with the guidance of the responsible professor, the communication was limited by the lack of device, internet and knowledge of the use of these technologies.

Thus, the main objective of this study is to identify the main challenges faced in the teaching-learning process of experimental subjects in a chemistry laboratory, by students and teachers in the Degree in Chemistry at IFPI Campus Picos, before and during the pandemic. As well as verifying what factors can stimulate students' interest in experimental subjects during the pandemic and what is the learning performance in relation to experimental subjects, during the pandemic.

2 METHOD

At first, a bibliographic research was applied to collect data and a better theoretical basis than According to Macedo (1994 apud Sousa, Oliveira, Alves 2021, p.67) “it is the first step in any type of scientific research, for the purpose of reviewing the existing literature and not redounding the subject of study or experimentation.”

For the analysis of the research, two types of approach were applied, one being qualitative and the other quantitative, emphasizing the remote teaching-learning process of the experimental subjects in the laboratory of Chemistry, having as target audience the professors and students of the Instituto Federal do Piauí-IFPI, Picos campus, active in this teaching area.

Data collection took place from two online questionnaires, one for the 4 teachers of the experimental chemistry discipline, anonymously being identified, from number 1 to 4, questionnaire was prepared in Google Form, composed of 7 questions and was sent via WhatsApp and the one of the students participated 40 students of the Chemistry course through Google Forms is available on the WhatsApp platform, containing 8 questions. Students were identified from 1 to 40, preserving their anonymity. The questions

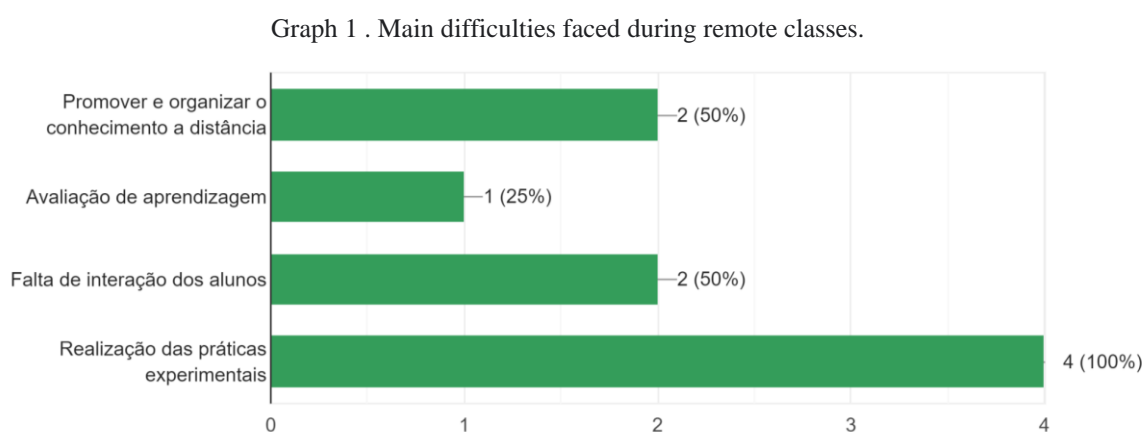
were objective and open, answered according to the individual experiences of the interviewees in relation to the remote experimental teaching of chemistry, the technologies used during this process, knowledge acquired and their perspectives for teaching. The results obtained were posted in graphs and tables to be discussed

3 RESULTS AND DISCUSSION

To verify the main challenges faced in the teaching-learning process of experimental subjects by students and teachers in the Degree in Chemistry, in the midst of the pandemic, two questionnaires were carried out (found in the appendix of this work). One for teachers and one for students. Therefore, in this part of the work, we will approach the data obtained in the application of this questionnaire intended for teachers and soon after, the data obtained in the students' questionnaire.

3.1 DATA OBTAINED IN THE TEACHERS QUESTIONNAIRE

The questionnaire seeks to understand the main difficulties faced during remote classes, the process of adapting these classes and learning from it, compared to face-to-face classes. Look at graph 1:



Source: Survey data, 2022.

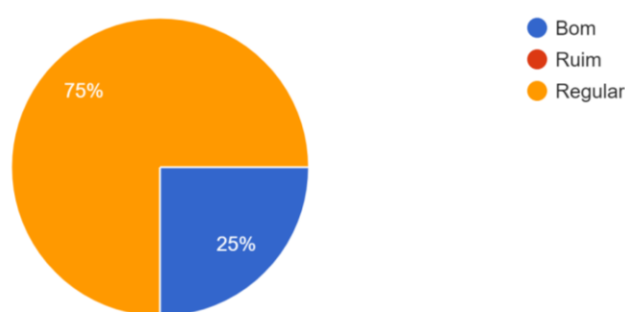
In Graph 1, we can identify that teachers had difficulty in developing more accessible practices for students, this result was to be expected, as the laboratory discipline works on the basis of practical classes with the help of the teacher inside the laboratory with all the materials needed to carry out the experiments.

Experimental activities carried out in the laboratory or in the classroom are relevant when characterized by their investigative role and their pedagogical role in helping the student to understand phenomena. (SCHNETZLER and MARTINS 2018 apud Ferreira, SOUTO , SILVA, RAULINO E SANTOS, 2019, P. 1)

In graph 2, we identified that the adaptation process in these remote classes was 75%. In these remote classes, the teachers noticed that the students missed the interaction with them, that is, a classroom discussion in which everyone puts their opinion. Another issue with the same result as before was the

discussion of organizing these online classes so that students could understand the content, which more than half also answered that it was not so organized, despite the teachers making an effort to plan the classes. In Graph 2, we identified that the adaptation process in these remote classes was 75%, they managed to adapt to the technology in a certain way since the students have a mastery with digital devices, being able to familiarize themselves with the new resources, but on the other hand 25% thought the whole process of change in their daily routines was bad, which is normal, because not everyone can follow these classes, as they are sometimes very tiring, being on the computer or cell phone screen watching it.

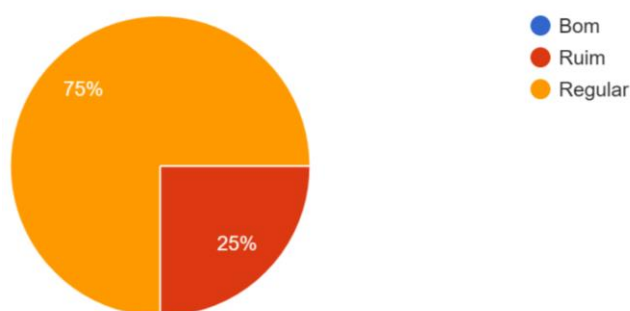
Graph 2. The process of adapting remote experimental classes.



Source: Survey data, 2022.

In graph 3, we have the comparison of remote classes with face-to-face classes, which reaches 75% again, if we observe the great majority found regular education, but it did not reach 100%, because in face-to-face classes the degree of learning is extremely high, it is in In a classroom we share knowledge, and those 25% of people who did not agree with remote learning is an answer to continue with face-to-face and online classes just in case of another worldwide problem that could replace it.

Graph 3: Student learning during remote classes compared to face-to-face classes.

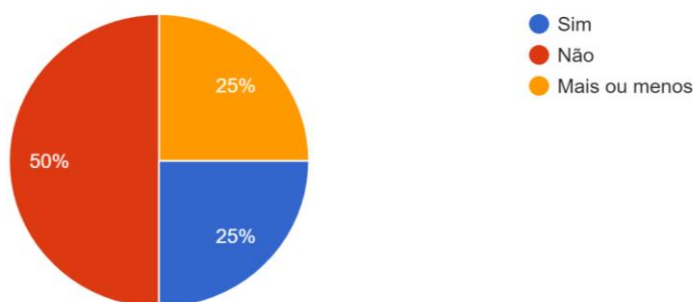


Source: Survey data, 2022.

In graph 4, the representation of the image shows the expected results of the students in relation to learning reached 50%, they answered that they did not learn as much and the other half of 25% concluded that they were not successful, that is, there is a gap in this remote learning that is says innovative and is not bringing as many benefits.

Integrating a new instrument [digital technology] in the classroom implies pedagogical changes, changes from the point of view of the teaching vision, which must be studied and considered by teachers. (BITTAR, 2010 apud COSTA E PRADO, 2010 p. 220).

Graph 4 : Expected results in the subjects of Experimental Chemistry were achieved in the pandemic.



Source: Survey data, 2022.

In all the results on learning, we soon imagine what were the methods cited by teachers to be able to bring some knowledge to their students? So we had some answers that prove that the methods were the most technological possible to be developed in a short time, in that chaotic moment that was all this pandemic and they sent their respective answers that are just below:

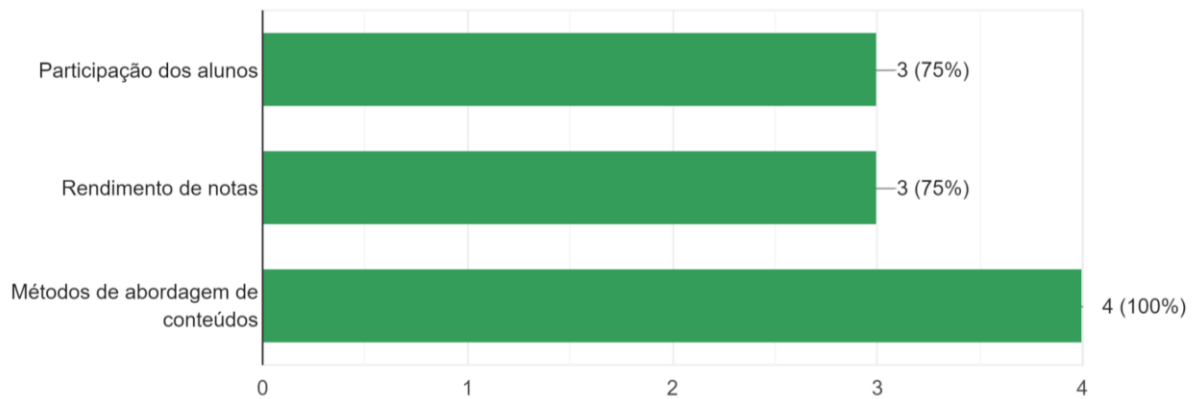
Table 1: Methods developed by Teachers to teach their remote classes

TEACHERS	ANSWERS
1	Lab practice videos
two	To carry out the experiments according to the course syllabus, the practices were adapted so that the students could perform them at home.
3	Practical classes with alternative materials and videos from virtual platforms or youtube.
4	Youtube videos with practices developed in the laboratory.

Source: Survey data, 2022.

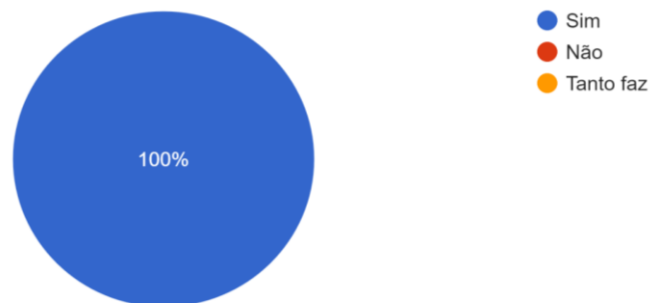
In Graph 5, the percentage difference between face-to-face and remote classes is revealed, and we obtained the following conclusion: of such. According to GIRAFFA (2012, p.17) “Currently, the method of teaching and learning requires an increase in research and communication techniques, since technology has made the classroom communicate more and become closer. the information. Emphasizing, still, that it is necessary for the professor to be careful with the sources of research and in how to prepare his classes so that both, students and professors, do not just stop at something superficial.”

Graph 5 : The difference noted between in-person and remote classes.



Source: Survey data, 2022.

Graph 6: Return of face-to-face classes.

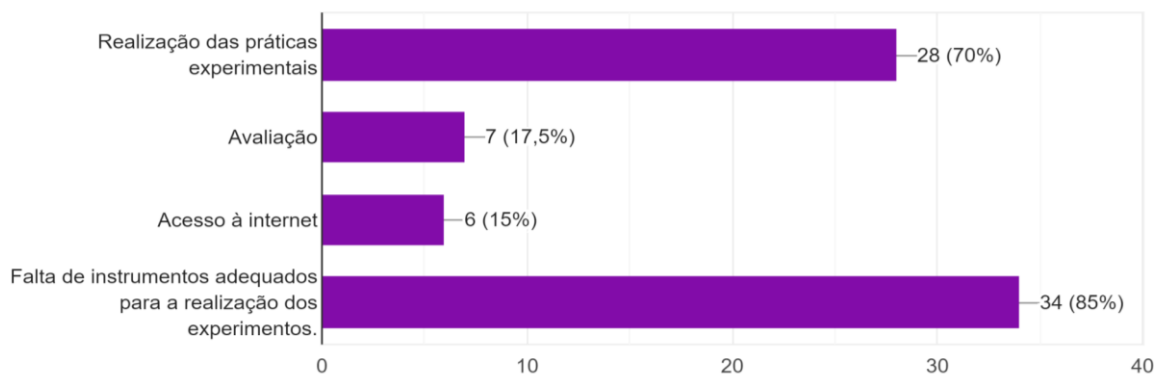


Source: Survey data, 2022.

3.2 DATA OBTAINED IN THE STUDENT QUESTIONNAIRE

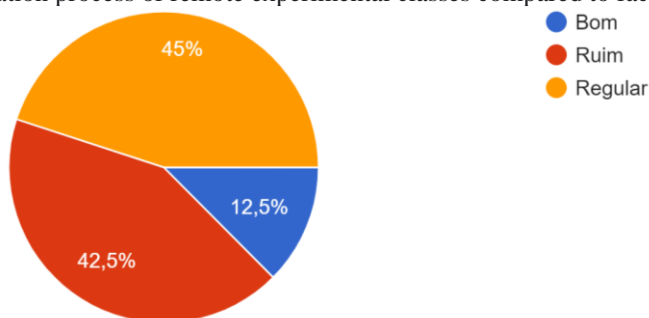
In the questionnaire applied to students being identified as: 1 to 40, preserving their anonymity. Starting the answer to the first question we can analyze in image 7, about 85% answered that they did not have adequate equipment to carry out the experiments carried out at home, the only way the students had was to adapt domestic equipment to perform the same, sometimes they had to pick up with a neighbor, buy. The student had to redouble himself to be able to carry out the practices at home, thus having a lot of difficulty, each student had his doubts and questions about the experiments. In carrying out the practice, many had to repeat the experiment because they did not reach the expected result. Therefore, there are several gaps when it comes to carrying out an experiment and having to adapt it is necessary for the student to redouble his attention and see what are the best possibilities to reach a result close to the laboratory with the appropriate equipment. About 75% say they had some difficulty in carrying out these adapted practices, the persistent difficulty when doing something in another environment that will be adapted and without adequate materials. Graph 7 shows the following detailed results:

Graph 7: Main Difficulties Faced by Students during Remote Classes



Source: Survey data, 2022.

Graph 8: Adaptation process of remote experimental classes compared to face-to-face classes



Source: Survey data, 2022.

When we talk about the process of adapting these classes, we identified that almost everyone had some difficulty, if we analyze graph 8 we will see that about 45 % found it regular, little by little they were adapting to this new learning style, but there is another percentage of 42.5% did not like to leave the usual teaching to enter a totally unknown world without proper preparation. In this way, we can take into account that there was difficulty in adapting.

In an emergency and with little time for planning and discussion (which would take months in a normal situation, teachers and school managers, public and private, from basic to higher education, had to adapt in real time (in real time) the curriculum, activities , contents and classes as a whole, which were designed for a personal and face-to-face experience (even if semi-present), and transform them into a fully experimental Emergency Remote Teaching. . It was the fastest digital transformation that is known in an entire sector and at the same time (ENSINO..., 2020, n. apud COSTA E NASCIMENTO, 2020 P. 2).

Regarding the tools and methods used by the most successful teachers, see the following student responses in the table below:

CHART 2: Main tools used by teachers according to students.

STUDENTS	ANSWERS
1	Videos of experiments on youtube, for the creation of the report.
two	Videos with the experiments already done.

3	The practice of the experiment at home.
4	Use everyday materials to make experiments possible.
5	It was the experiments where I had everything at home and they were simple.
7	To tell the truth, I was not successful in almost any, why I don't know, because I followed all the steps described by the teacher .
8	Theoretical classes, using the Google Classroom and Google Meet tool.
9	Experiment with tools you have at home.
10	Videos with the experiments already done.
11	Encourage the realization of practices at home, bring the results in the form of a report and seminar.
12	Encourage the realization of practices at home, bring the results in the form of a report and seminar
13	The script created by the teacher, in my opinion, was successful because it was charged with four different forms of activities, which made it absorb as much content as possible.
14	The use of videos with demonstration of experiments and from there make the reports.
15	The adaptation of experiments to the students' daily lives, thus bringing the option of using things from our home and learning chemistry.
16	I found it useful to observe a professional doing it in a video, as well as to do it with homemade materials, although doing the experiments in the laboratory is more fruitful.
17	There were no methods on the part of the Professor who have exodus.

Source: Survey data, 2022.

Analyzing all these answers, we noticed that most students answered that one of the main tools used was youtube with experiment videos that could be done at home. There was clearly the observation of these videos where the teacher could propose to the students to repeat the same experiment at home with the same materials, prepare a practice report or even the presentation of a seminar on that practice, it depends a lot on the teacher he had these possibilities to try to reach satisfactory learning results, and other responses from students were meetings through meet and others were that these classes were not successful.

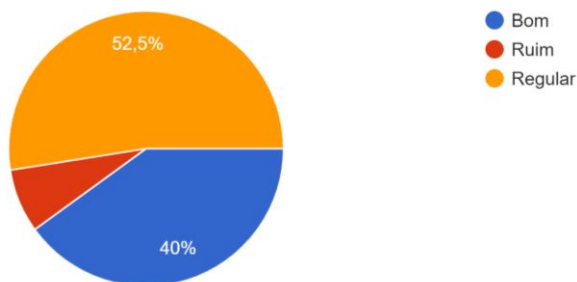
In this sense, experiments can enrich teaching planning and practice and thus create points of articulation with themes and concepts present in curricular guidelines (SANTOS; NAGASHIMA, 2017 apud FERREIRA , SOUTO, SILVA, RAULINO E SANTOS, 2019 P.4).

If you stop to think about it, the little knowledge that was obtained during this pandemic was enough to take advantage of, just imagine that without the technology we have today, we wouldn't have done anything. According to the Author Almeida (2007 . apud GARCIA. 2013 P.32)), the use of technologies in the educational process provides new teaching and learning environments different from traditional environments, and the real contributions of technologies to education arise as they are used as mediators

for the construction of knowledge. With the advancement of technology that has been taking science along, more lives can be saved and education can not stop completely until everything is stabilized, which took 2 years and we still suffer all that happened, but not all was lost, it remains only to continue.

Let's see in graph 9, another demonstration that the methods used by the methodology developed by the teachers contributes to some parts of teaching, such as using the cell phone to watch classes posted in the classroom or youtube videos, absorbing some parts of the content and thus taking the classes to the face-to-face return.

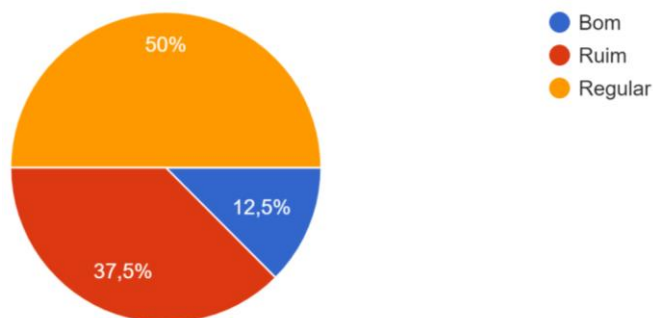
Graph 9: Methods used by teachers to pass on the subject.



Source: Survey data, 2022.

Teachers were regular, reaching 52.5%, this shows that the methods were the most appropriate at that time when there were not so many alternatives, complete methods were not possible, according to the students, 40% did not reach the desired goal.

Graph 10: The learning performance during the remote experimental classes being compared with the face-to-face ones.

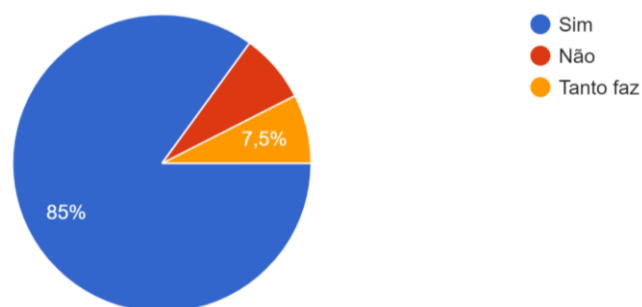


Source: Survey data, 2022.

Regarding the learning performance, it was considerable, about 50% answered that it was regular and another part 37.6% was bad, they got almost nothing and only 12.5% thought it was good, so the majority thought it was regular, perhaps due to the ease of access to the internet at available time.

The main function of education does not change because we live in a pandemic. Student learning is still the focus of classes and the teacher has a fundamental role in this process. Despite being a huge challenge, the teacher has at hand a path of possibilities to lead the appropriation of knowledge and the development of the proposed actions, strengthening the bonds between family and school, key pieces for the success of remote teaching. (MARCON E VALLE 2020 apud COSTA E NASCIMENTO, 2020 P.3)

Graph 11: Return of face-to-face classes



Source: Survey data, 2022.

In graph 11, we notice that about 85% of the students answered that they did want to return to face-to-face classes and only 7.5% did not want to return. So we can prove that face-to-face classes have more resources to work with and several forms of methodology that we can use within a classroom to pass on content, thus undoubtedly better and profitable than the same.

The students' answers about the biggest difficulties faced by the students when carrying out the practices in their homes with improvised materials that served as substitutes for the appropriate ones. Most of them answered the lack of adequate material, this allows the experiment without due care, to go wrong, when the material is improvised it is necessary to have a lot of attention and another answer of the students was the lack of the teacher to guide at the time of the experiment, because there is It is customary for students to enter the laboratory and have the teacher answer any questions that arise during practice, sometimes a phenomenon never seen before. It is notable that the students lacked the face-to-face teacher at the time of the experiment. According to CORDEIRO, educators had to reinvent themselves to be able to teach at a distance through remote teaching and for students to experience new ways of learning, without the face-to-face and warm contact of the teacher. Here are the main opinions of the students:

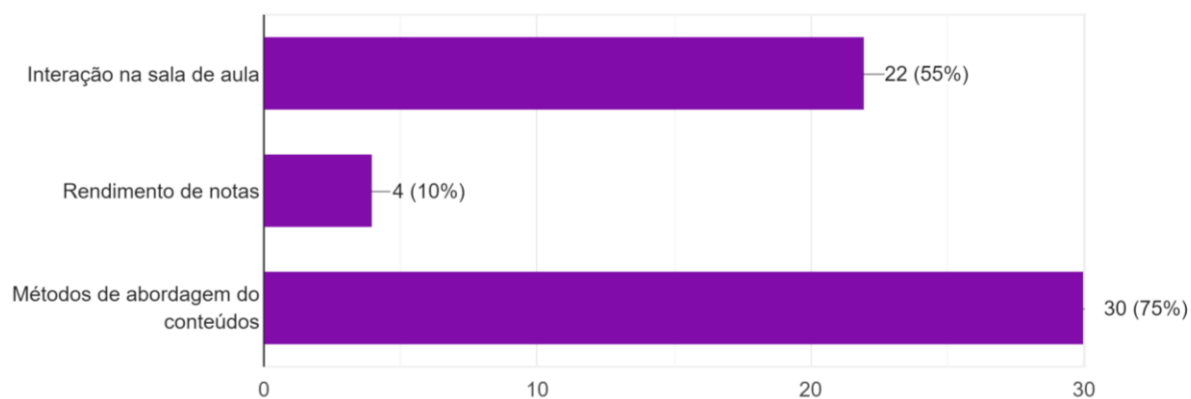
CHART 3: Main difficulties during remote chemistry laboratory classes.

STUDENTS	OPINIONS
1	Lack of suitable material.
two	During the experiments, several doubts arose, which there was no way to discuss. And the mistakes of this attempt became stressful
3	Not having the help of a teacher when doing the experiment.
4	The lack of adequate materials/reagents to carry out the practices. Because of this, sometimes the result of practice does not turn out as expected.
5	Difficulty in finding materials to carry out the experiments.
6	Lack of reagents and glassware

7	The lack of instruments to carry out the experiments, lack of space and lack of access to books to use in research.
8	The understanding of the content.
9	The materials, and the practice itself, because if I'm not mistaken, I only obtained a satisfactory result in one experiment.
10	The shortage and cost of materials.
11	Lack of necessary equipment.

Source: Survey data, 2022.

Graph 12: Greater difference noticed comparing with the experimental face-to-face classes with the remote ones .



Source: Survey data, 2022.

Finally, Graph 12 shows that the biggest difference according to the students noticed in the online classes were the methods that the educators used to teach their classes, which reached 75%, using technology in their favor to then get on the learning path. . However, we have another answer that the students marked, which was the lack of interaction in the classes that they felt with about 55%, we can see that these two answers are flaws that are a risk to be taken in relation to a new teaching system created quickly. , but that can meet some needs that was to continue to have access to education, because without it there is no way the world can function.

4 FINAL CONSIDERATIONS

This research was started from the difficulties in remote classes experienced by students of the Chemistry course, in the discipline of experimental chemistry, this new way of teaching ended up changing the routine of students and teachers who were forced to adapt, many challenges were faced when throughout these classes they had technology in their favor.

Great points were observed during this research and one of them was with the teachers who had to be quick and plan their classes and identifying what would be best for the students, but we know that during the results when listening to the opinion of teachers and students there were flaws despite that we would know from the beginning that quality teaching is that experienced in a classroom with direct contact with the educator.

Another point draws a lot of attention and in the communication between students and students to remove doubts and questions, in the matter of the teacher passing a practice and the student had any doubts about the material or reagent or that the experiment did not work and the students answered who often had no feedback regarding their doubts, they felt they lacked adequate guidance from the teacher and this was one of the flaws. the good side is that teaching is more difficult to practice because of doubts that may arise and at that moment it is not possible to be answered. And the educator with so many jobs cannot respond to all students.



Despite the existence of many obstacles we still have to overcome, remote teaching brought a positive point, which was to bring education to thousands of students being broadcast live or recorded for students to continue studying, even with different resources that can bring a little of the classroom for the screen of Smartphone, tablet or cell phone the lessons. Finally, the student discovered that there were bad and good parts at the same time. Although face-to-face teaching is indispensable for quality education.

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CHAPTER 42

The surgeon-dentist's view on the "Little Tongue Test" in Primary Care: a scoping review

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ABSTRACT

Objective: Describe through national and international literature the knowledge of the dental surgeon in relation to Ankyloglossia and the Little Tongue Test in Primary Care throughout the country. A scoping review was carried out (Joana Briggs Institute), where 07 articles published from 2011 to 2019 were selected. With mapping and analysis of the results we constituted the thematic axes: tongue test and its relationship with professionals; ankyloglossia; oral health and maternal-child network. The data showed that there is little knowledge by the professionals regarding the tongue test and ankyloglossia, and that the dentist is little included in the maternal and child network in the Primary Care setting. It was concluded that there is no integrality and insertion of the oral health team with the family health team when it comes to the maternal and child network. Furthermore, it was observed that the CD does not have enough knowledge and does not perform the Tongue Test in the Basic Health Unit.

Keywords: Dentist, Lingual frenum, Primary care, Ankyloglossia.

1 INTRODUCTION

Ankyloglossia, also known as stuck tongue, is a developmental anomaly, originated due to a defect in the apoptotic process of embryonic cells of the oral floor and lower tongue. This alteration causes changes in the insertion of the frenulum, characterizing the short lingual frenulum and the limitation of correct tongue movement, causing interference in physiological functions such as speech and swallowing. Such changes can and should be diagnosed soon after the birth of the baby, in order to avoid problems such as failure in the development of the stomatognathic system, early weaning, generated by discomfort and pain of the mother during breastfeeding and thus leading to loss or little weight gain of the newborn (De Oliveira, De Lima & Fernandes, 2011).

In 2014, Martinelli, Marchesan & Félix, 2014, created a protocol that evaluates the baby's lingual frenulum, with the purpose of facilitating the diagnosis of this alteration. The protocol is known as the Little Tongue Test and became a law sanctioned in 2014 (Law 13.002/2014), which makes it mandatory to

perform the lingual frenulum assessment protocol in neonates in hospitals and maternity hospitals. This is a simple, quick, painless, and easy to apply test, performed in the first 48 hours, in the first month or until the baby is six months old, by means of anatomical and functional screening (Da Silva et al., 2020).

To perform this test, the most suitable professionals are dental surgeons, pediatricians, speech therapists, and nurses. However, any properly trained health professional is able to perform the "Little Tongue Test", although only dental surgeons and doctors can perform the necessary surgical procedure (Cavalcante & Da Silva, 2019).

In 2019, a survey conducted, it was found that most health professionals interviewed in this study, were unaware of the application of the protocol, its existence and the law that regulates the "Little Tongue Test" (Pinto et al., 2019).

Primary Care is the main gateway to the Unified Health System (SUS), and is characterized by a set of health actions and services, including health promotion and prevention. Its main strategy is the Family Health Strategy (ESF), which is composed of a multidisciplinary team, in order to work with integrality and equity (Giovanella et al., 2020).

According to the National Plan for Brazilian Oral Health (PNAB), the oral health team is also responsible for health promotion and prevention actions, and thus the "Little Tongue Test" protocol can be performed by the dental surgeon in Primary Health Care. However, we know the difficulty of integrating the ESF, ESB (oral health team), and municipal management.

Talking about integrality, in Primary Health Care it is of fundamental importance that the work involves the professionals who are part of the family health team and the oral health team, increasing and adding knowledge, acting in an interdisciplinary vision, thus increasing the resolution of the users' health problems, looking at them as a whole. For this to happen effectively, local management has the obligation to be participatory, especially in relation to permanent education, because it is from it that professionals are trained for possible changes in the work and consequently, positively affecting the lives of people (De Araújo et al., 2018).

The programs agreed and structured to offer Primary Care to child health have as main objectives health promotion, disease prevention, treatment, rehabilitation and monitoring, requiring the participation of the user, which is the child involved, their parents and families, in addition to the professionals who work in the Family Health Strategy (FHS), causing the integration of various professional classes that work not only in Primary Care, but also that this care will extend to the various levels of health, secondary and tertiary (Consolaro, 2014).

Given the above, this work aims to describe through literature the dentist's knowledge about Ankyloglossia and the importance of early diagnosis through the Little Tongue Test in Primary Care throughout the country.

2 METHODS

The scoping review, recommended by the Joanna Briggs Institute, is a form of knowledge synthesis that addresses an exploratory research question and its objective is to map key concepts, types of evidence, and gaps in research related to a given topic, with the purpose of synthesizing and disseminating the results of studies on a subject. Thus, a systematic scoping analysis was performed, and the data were analyzed and synthesized in narrative form.

In the present review, the PCC strategy was used for question formulation, being "P" for population/participants, "C" for the concept to be investigated, and "C" for context. Adjusting the object of study to the strategy P: health professionals; C: tongue test and ankyloglossia; C: public health, the guiding questions are: What is the knowledge in dentistry regarding the tongue test? What is the knowledge of the dentist inserted in Primary Care about Ankyloglossia and its early diagnosis?

The research strategy and the entire review process were based on the Joanna Briggs Institute review methodology described in five phases: Identification of the research question; Identification of relevant studies; Selection of studies; Mapping of data; and Clustering, synthesis, and reporting of results (Siqueira et al., 2019).

The research was consolidated through the collection and selection of scientific articles found in the electronic databases Virtual Health Library (VHL), SciELO and Lilacs, in the period of the last ten years (2011 to 2021). The search for studies in the grey literature included: google academic and CAPES database. The search strategy adopted in each database, descriptors/keywords used and the references selected are described in (Chart 1).

Chart 1- Search strategy in the databases and number of results

Database	Strategy	Number of articles
Lilacs	("little tongue test" AND "dentist" OR "lingual frenulum") [keywords]).	64
BVS	("little tongue test" AND "dentist" OR "lingual frenulum" AND "primary care" OR "primary care" [keywords]).	12
Scielo	(" little tongue test" AND "lingual frenulum" [keywords]).	06
Google Acadêmico	("dentist" AND "primary care" OR "primary care" AND "little tongue test" AND NOT "surgery" [keywords]).	28
Capes	(little tongue test" AND "primary care" [keywords]).	01

Source: own author.

Inclusion criteria: articles in English and Portuguese, from 2011 to 2021, that were available online in the databases. Exclusion criteria: articles that ran away from the proposed theme of the study and that were not available.

The search strategy identified a total of 111 studies, 28 of which were found on Google Scholar, where, after applying the inclusion criteria, 50 studies remained. Subsequently, the titles of the 50 studies were read, excluding 12 articles that did not meet the proposed theme, leaving 38 articles to read the abstracts. After reading the abstracts, 8 articles were included in the Scoping Review. The results of the search are presented in a flow chart in the PRISMA model (Figure 1). The data search, title and abstract reading were done by two reviewers who are also authors of this study and agreed on the choice of articles to be included.

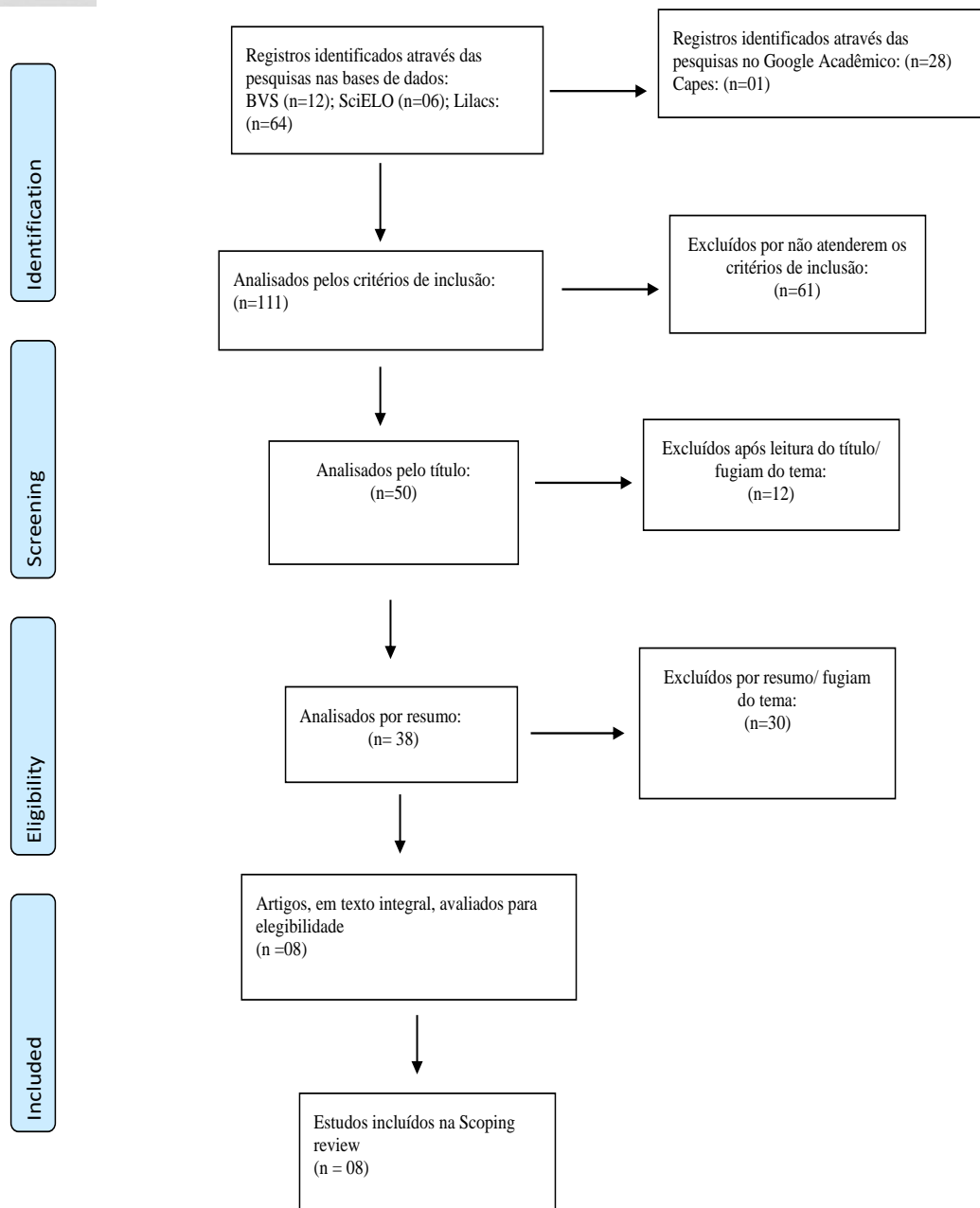
The 08 studies selected to be part of this review were mapped by means of a table (Chart 2) with the following information: author/year of publication; title; database/magazine of publication; objective; type of study. The studies were organized in ascending order according to their year of publication. After reading the main data, the articles were divided according to the themes presented in (Chart 3); which brings the following themes: the Little Tongue Test and its relationship with professionals; ankyloglossia; oral health and the maternal-child network.

Initially, a descriptive analysis of the data was carried out, characterizing the final considerations/conclusion of each study. Subsequently, the articles were read and analyzed following the steps of the scope review, seeking to synthesize the most relevant thematic axes of the works included.

Figura 1: Fluxograma Prisma adaptado para Revisão de Escopo: Figure 1: Adapted Prism Flowchart for Scope Review
 Figura 1- Fluxograma Prisma adaptado para Revisão de Escopo.



PRISMA adaptado Revisão de Escopo



Fonte: autoria própria

TRADUÇÃO: FIGURA 1

Prisma Adaptado Revisão do Escopo: Adapted Prism Scope Review

Registros identificados através das pesquisas nas bases de dados: Records identified through the database searches

Registros identificados através das pesquisas no Google Acadêmico: Registrations identified through the Google Scholar Searches

Analisados pelos critérios de inclusão: Analyzed by the inclusion criteria

Excluídos por não atenderem os critérios de inclusão: Excluded for not meeting the inclusion criteria

Analisados pelo título: Analysed by title

Excluídos após leitura do título / fugiram do tema: Excluded after reading the title / not related to the subject

Analizados por resumo: Analyzed by Abstract

Excluídos por resumo / fugiam do tema: Excluded by abstract / not on topic

Artigos, em texto integral, avaliados para elegibilidade: Articles, full-text, assessed for eligibility

Estudos incluídos na Scoping Review: Studies included in the Scoping Review

Chart 2. Information from the articles included in the Scoping Review

Author/Year	Title	Database/ Journal	Objective	Study Type
Melo et al (2011)	Ankyloglossia: case report.	Lilacs/ RSBO.	To describe a case of ankyloglossia in a 2-year-old female child seen at the Child Care Clinic of the Pediatrics Department of the Federal University of Paraná.	Case report.
Martinelli et al (2017)	Elaboration and development of a web site about the Little Tongue Test.	SciELO/ CEFAC Journal.	Develop a website about the Little Tongue Test.	Applied research.
Cavalcante et al (2017)	Oral health in early childhood: perceptions of ESF professionals.	Google Scholar/ Journal of APS.	To understand the perception of FHS professionals regarding the comprehensive oral health care of children.	Qualitative/ exploratory study.
Penha et al (2017)	The Little Tongue Test in the Dentist and Primary Health Care nurses' view.	Google Scholar / Archives of Health Investigation.	To evaluate the knowledge of CD and nurses who are part of Basic Family Health Units in the Sertão of Paraíba.	Cross-sectional study.
Pomini et al (2017)	Oral health education for pregnant women, puerperae and early childhood: report of an extension activity.	Google Scholar / Brazilian Journal of University Extension.	Report the actions on educational and preventive levels in Oral Health.	Experience Report.
Pomini et al (2018)	Knowledge of pregnant women about the Little Tongue Test in neonates.	Lilacs/ UNESP Odontology Journal.	To verify the knowledge about LTT and its relation to the sociodemographic profile of pregnant women.	Tracking Study.
Pinto et al (2019)	Health professionals' knowledge about the diagnosis and management of ankyloglossia in infants.	Lilacs/ Health and Research.	To evaluate the knowledge of health care professionals regarding the diagnosis and clinical management of lingual frenulum in infants.	Cross-sectional study.
Karkow et al (2019)	Lingual frenulum and its relation to breastfeeding: a health team's understanding.	Lilacs/ Communication Disorders.	To verify the understanding of health professionals regarding the relationship between lingual frenulum and breastfeeding.	Descriptive study.

Source: own author.

Chart 3. Thematic axes found in the articles included in the Scoping Review.

Thematic Axis	Authors	Nº of articles
Little Tongue Test and its relation with professionals	Martinelli et al (2017); Penha et al (2017); Cavalcante et al (2018).	03
Ankyloglossia	Melo et al (2011); Pinto et al (2019).	02
Oral health and the maternal-child network.	Pomini et al (2018); Pomini et al (2017); Karkow et al (2019).	03

Source: own author.

3 RESULTS

This scope review work had as main objective to identify the knowledge in the national and international scientific literature about the knowledge of the dentist inserted in primary care in relation to ankyloglossia and the Little Tongue Test.

Of the 08 articles analyzed it was observed that 01 was a screening study, 01 a descriptive study, 01 a case report, 01 an applied research, 02 cross-sectional studies, 01 a qualitative/exploratory study, and 01 an experience report. As for the databases, it was observed that 04 were found in the Lilacs base, 01 in SciELO base, 03 in google academic (gray literature).

For further synthesis, a chart (Chart 4) was prepared, specifying the final conclusions/conclusion of each work chosen for this scope review, in order to verify whether they reached their due objectives.

Chart 4. C Final considerations/conclusion of the articles included in the Scoping Review.

Author/Year	Title	Final considerations/conclusion
De Oliveira Melo et al. (2011)	Ankyloglossia: case report.	The routine examination of the lingual frenum allows the identification of abnormalities of its insertion and enables preventive measures for interferences during the breastfeeding period.
Martinelli et al. (2017)	Elaboration and development of a web site about the Little Tongue Test.	From this work, the "Little Tongue Test" website can be accessed at www.testedalinguinha.com .
Cavalcante et al. (2017)	Oral health in early childhood: perceptions of ESF professionals.	It was observed that the organization of the work process of the EqSF is decentralized and not focused on the individual risk of the user and/or its coverage territory, with oral health care for children in the ESF still restricted to the dental service, as well as the lack of systematic monitoring by the ESF, evidencing a hegemonic biomedical model based on curativism.
Penha et al. (2017)	The Little Tongue Test in the Dentist and Primary Health Care nurses' view.	It was found that there is no continuing education to accompany the professionals and that they perform according to their knowledge.
Pomini et al. (2017)	Oral health education for pregnant women, puerperae and early childhood: report of an extension activity.	The authors found that the project helps to create a bond between the pregnant/puerperal women and the students/residents, which results in an improvement in the acquisition and maintenance of oral health of mother and baby. It also helps in the development and training of the participants in the care of this public.
Pomini et al. (2018)	Knowledge of pregnant women about the Little Tongue Test in neonates.	The knowledge of pregnant women about LTT is superficial, especially among those with lower education and income, which accentuates the need for public strategies focused on improving the quality of care offered to the mother-child binomial.
Pinto et al. (2019)	Health professionals' knowledge about the diagnosis and management of ankyloglossia in infants.	It was concluded that there was a great lack of knowledge about the mandatory tongue test and difficulty in correctly diagnosing ankyloglossia in infants.

Karkow et al. (2019)	Lingual frenulum and its relation to breastfeeding: a health team's understanding.	Given the speeches of the participating professionals, it was found that there is no consensus on the understanding of the relationship between breastfeeding and the lingual frenulum.
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Source: own author.

4 DISCUSSION

In view of the searches made in the databases, the eight papers included in the Scope Review were divided according to the theme they presented, so the synthesis will be made in three topics.

4.1 LITTLE TONGUE TEST AND ITS RELATIONSHIP WITH PROFESSIONALS

First of all, it is necessary to know what the Little Tongue Test is and what its benefits are. The LTT was developed with the purpose of identifying ankyloglossia early in preferably newborn babies, reducing risks of future problems in the stomatognathic system and also preventing early weaning (Martinelli et al., 2017).

The Protocol for tongue frenulum assessment in babies, better known as the Little Tongue Test, was developed and validated during master's and doctoral studies at the Bauru School of Dentistry, USP, and in 2014, more precisely on June 20, federal law 13,002 was passed requiring the application of the LTT in maternities and hospitals throughout Brazil. However, even with the law being sanctioned, there is a large majority of newborns who do not perform the LTT. For this reason, a website was created with the objective of instructing parents and professionals on the LTT and ankyloglossia (Martinelli et al., 2014).

The insertion of the dental surgeon in the family health team has been a challenge since the implementation of the oral health team in Primary Care (BHC). It aims to enable an expanded interdisciplinary and comprehensive approach to users, particularly children in the early childhood phase. According to a study by Cavalcante, De Araújo Filho & de Saboia, 2017 found that the perception of professionals of the Family Health Strategy regarding the oral health of children in early childhood is minimal, if there is a knowledge, but flawed and ineffective. Comprehensive planning is not done with quality and even less its execution, leaving the dental childcare uncovered, thus it is implied, that the professionals of the oral health team do not perform the LTT in AB.

A study conducted through a questionnaire adapted from Nascimento, Soares and Costa (2015), composed of seven questions, applied in 42 FHUs, urban area, in the city of Patos, Paraíba, identified that most CD professionals and nurses of the PCU, did not know and did not apply the LTT, but that they became interested in learning (Penha et al., 2018).

4.2 ANKYLOGLOSSIA

Ankyloglossia, popularly known as tongue-tie, is characterized by a change in the lingual frenulum, causing limitations in tongue movements, which may cause problems related to swallowing and speech. This modification of the insertion extends from the tip of the tongue to the lingual alveolar ridge and it can

be visible already at birth. Its definition varies according to the position in which the lingual frenum is inserted, and may be: short, thick muscular and fibrous frenum (De Oliveira et al., 2011).

Partial ankyloglossia is more common, while the fusion of the tongue with the floor of the mouth is a rare condition. This abnormality hinders the movements of the tongue, affecting mainly speech and swallowing, besides later, it can psychologically affect those affected and not treated early in relation to bullying (De Oliveira et al., 2011).

In relation to swallowing, we highlight breastfeeding in the first months of life. Tongue clamping interferes with breastfeeding, making it impossible for the newborn to make the correct grip, causing pain for the mother, malnutrition for the child and early weaning, thus weakening one of the most mentioned issues in the mother-child network of the single health system, which is exclusive breastfeeding until six months of life (De Oliveira et al., 2011).

A study by Pinto et al. (2019) evaluated the knowledge of healthcare professionals, regarding the diagnosis and clinical conduct for the treatment of ankyloglossia in infants. A questionnaire was made where questions were asked about the evaluation of the lingual frenum, totaling 84 health professionals, being them: doctors, dentists, speech therapists, and pediatricians, most working in the Family Health Strategy. Only 21 professionals answered the questionnaire satisfactorily, and it was concluded that most of these professionals had no knowledge about ankyloglossia and its form of diagnosis through the Little Tongue Test.

4.3 ORAL HEALTH AND MOTHER-CHILD NETWORK

Some of the educational approaches within public health that can and should be done by the professionals that make up the oral health team are child dental care and prenatal dentistry. During pregnancy until the puerperal period and early childhood, it is extremely important that the mother understands the influence that her own actions will have on the baby's life. In an extension project "Oral health education for pregnant women and early childhood", which had as its main objective to bring prevention and health promotion to pregnant and postpartum women and early childhood, it was found to have a positive impact on the lives of these participants, focusing on the issue of exclusive breastfeeding during the first six months of life (Pomini et al., 2017).

Still bringing to the context of health education aimed at pregnant women, Pomini et al. (2018), developed a study in which they measured the knowledge of pregnant women in a given territory regarding the diagnosis of ankyloglossia. It was found that most had misinformation about what LTT was and that the lower their level of education, the less information was obtained. After these data, it was concluded that it was necessary for the oral health team to instruct and monitor these pregnant women.

The tongue plays an important role during breastfeeding, and when there are problems in its development, it gets damaged, which can easily lead to early weaning. It is known that breastfeeding not only has nutritional benefits, but also creates a mother-child bond and is important for the correct

development of the stomatognathic system. Given this, the importance of early diagnosis of ankyloglossia in newborns, because from this test done in a simple and correct way, future problems will be avoided and benefits will be gained (Karkow et al., 2019).

5 CONCLUSION

Dentistry in public health still becomes a sector without resources and with few investments by the management and often by the professionals themselves. The lack of knowledge regarding the Little Tongue Test in public health services, especially when it comes to Primary Care, is visible, and the recognition of the benefits of early diagnosis of ankyloglossia is far from happening.

Childcare and the participation of the dentist in the Rede Cegonha (Stork Network) are totally weakened, with no planning for such follow-up, and as seen in the Scoping Review, there are not many studies on the subject for scientific support. The construction of scientific articles is necessary for a correct conclusion.

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CHAPTER 42

Academic research for implementation of python language programs for information measurement and coding for data compression

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ABSTRACT

This article presents the expanded abstract containing information about the academic research for implementation of programs in Python language

for information measures and coding for data compression. The research was conducted, at the Amazonas State University, by the student of Electronic Engineering course Williams Cavalcante Oliveira, under the guidance of Professor Paulo Cesar de Souza Cavalcante, and had its abstract presented in the 1st Amazon Stem Academy Conference 2021. The content of the presented abstract, transcribed in this paper, exposes brief theoretical review of information measurement calculation methods and methods for statistical and dictionary-based data compression encoding. Besides other information concerning the research, it also presents, as its final product, the Python language modules developed for the execution of the algorithms of the methods studied, for performing the calculations and encodings that were the object of the research.

Keywords: Information Measurement, Data compression encoding, Python Language.

1 INTRODUCTION

The present research aimed to develop modules in Python language for performing information measurement calculations and for data compression, addressed in part of the content of the subject Theory of Information and Coding (TIC). Huffman h To this end, a literature review was conducted on TIC course material and material for basic learning of the Python programming language. Program modules were developed for calculating information measures and modules for implementing compression algorithms, based on statistics: Shannon-Fano, Huffman, Arithmetic, and based on dictionaries: Lempel Ziv. The developed modules will allow TIC students, or others interested, to verify in practice their theoretical realizations of the functions needed for digital communication over noisy channels or for their storage in compressed form.

2 OBJECTIVES

The general objective of the project is to create and make available additional tools for consolidation of knowledge during the course of the Theory of Information discipline. The specific objectives, which

contribute to the achievement of the general objective, are: teamwork exercise; learning the Python programming language; consolidation of the didactic knowledge transmitted about information measures and data compression.

3 MATERIALS AND METHODS

The project was developed in compliance with the following stages: 1) indication by the Advisor of basic bibliography for research; 2) accomplishment of research by the student in physical documentation and material available on the Internet; 3) elaboration by the student of a brief theoretical reference on Information Measurement and data compression using the following codifications: Shannon-Fano, Huffman, Arithmetic and Lempel-Ziv; 4) Implementation by the Oriented Student of modules in Python language to perform Information Measurement calculations and encoding using the specified encodings. 5) Evaluation and guidance by the Advisor in each of the topics specified in the third step, as they were completed; 6) Joint preparation by the Advisor and the student of this Expanded Summary, and 7) Preparation by the student, with the Advisor's supervision, of the Project Presentation at a conference.

The bibliography indicated by the Advisor in the first stage was: Information Theory Class Notes [Cavalcante 2021]; video of the minicourse Mathematics with Python [INPE 2020]; site for access to Python Documentation [Python Software Foundation 2021].

3.1. THEORETICAL BASIS

In this subsection the theoretical basis on Information Measures and Coding for Compression of Digital Data will be exposed, i.e. data that is expressed using the binary numbering base, where there are only two symbols: 0 and 1. The following material was extracted from the Information Theory Class Notes [Cavalcante 2021].

I) Information Measure

Information is everything that is produced by a source to be transferred to the user. Regarding the measure of information one can consider two points of view: from the User, the measure of information is related to uncertainty (regarding the message that was transmitted), and from the Source, the measure of information is an indication of the freedom of choice exercised by the source when selecting a message. If the source has many different messages: the probability of each message tends to decrease with the number of messages. The user will have more doubts (more uncertainty, more information) regarding the message that will be chosen. For example, if the source has only one possible message: The probability will be maximum, equal to 1. The user will have no doubt (no uncertainty, no information) in relation to the message that will be chosen.

A) Hartley's Information Measure or Self-Information

Hartley (1928) proposed as a measure of the amount of information provided by the observation of a discrete random variable X. The information of a single symbol, I(X), is suggested by $\log_b K$, where K is the number of possible values of X. The probability of occurrence of one of the possible values of X is $P_X=1/K$. Thus, $K= 1/P_X$, i.e. K is the inverse of the probability of occurrence of a symbol. Hartley's information measure:

$$I(X) = \log_b K = \log_b \left(\frac{1}{P_X} \right) = -\log_b P_X \quad (1)$$

Thus Hartley's information measure can be defined as a logarithmic quantity linked to the inverse of the probability of an event. The base of the logarithm used, defines the unit of the information measure. If base 2 is used, as in digital communications, the unit will be bit. To exemplify, let the probabilities of emission by a source of bits 0 and 1, respectively: $P_0 = 1/4$; $P_1 = 3/4$, we have: Information transported by the digit 0: $I_0 = -\log_2 1/4 = 2$ bits and Information transported by the digit 1: $I_1 = -\log_2 3/4 = 0.41$ bits.

B) Shannon Information Measure or Entropy

Shannon (1948) defined that in general, if the i-th value of X has probability $P_X(x_i)$, then the Hartley information $\log 1/P_X(x_i) = -\log P_X(x_i)$ for this value should be pondered by $P_X(x_i)$, giving:

$$H(X) = \sum_i P_X(x_i) \log_2 \frac{1}{P_X(x_i)} = -\sum_i P_X(x_i) \log_2 P_X(x_i) \quad (2)$$

Shannon's measure could be considered Hartley's average information. Shannon called this measure of information entropy. The entropy of a source means that on average we expect to get H bits of information per symbol. Rewriting the entropy formula as:

$$H(P_1, P_2, \dots, P_M) = \sum_{j=1}^M P_j \log_2 \frac{1}{P_j} = -\sum_{j=1}^M P_j \log_2 P_j \quad (3)$$

To exemplify, suppose a source X emits four symbols $x_0, x_1, x_2,$ and x_3 with probabilities $1/2, 1/4, 1/8,$ and $1/8,$ respectively. The uncertainty, or entropy H(X) is given by: $H(X) = (1/2) \log 2 + (1/4) \log 4 + (1/8) \log 8 + (1/8) \log 8 = 1.75$ bits/symbol.

II) Encoding for Data Compression

The data compression process is performed by algorithms that receive M messages, sequences of bits of length N, and encode them for transmission or storage in M messages, whose length is less than N bits of the original messages, without loss of information (Lossless compression techniques). Statistical, or entropy-based, models need to know the statistics of occurrence of the symbols to be coded. Adaptive, or

dictionary-based, models perform the compression without needing the statistics of the source. The techniques covered in this research are shown in Chart 1 below.

Chart 1. Lossless Compression Techniques

Examples of Statistical Models	Examples of Dictionary-Based Techniques
Codes: Shannon-Fano, Huffman and Arithmetic	Lempel-Ziv(LZ) Codes: Lempel-Ziv (LZ 77), Lempel-Ziv (LZ 78) and Lempel-Ziv-Welch (LZW)

The average length of code words resulting from encoding for data compression is determined by:

$$\bar{L} = \sum_{i=0}^{M-1} p_i l_i \quad (4)$$

where l_i is the number of bits of the codeword corresponding to the symbol i , which occurs with probability p_i . Coding efficiency can be defined by the ratio between the entropy of the source or message and the average length of the code words:

$$\eta = \frac{H(S)}{L} \quad (5)$$

The compression ratio T_c of a compressor code is defined by the expression below:

$$T_c = \frac{\text{Qde bits texto sem compress\~ao} - \text{Qde bits texto com compress\~ao}}{\text{Qde bits texto sem compress\~ao}} \times 100 \quad (6)$$

TRADUÇÃO:

Qde bits texto sem compress\~ao – Qde bits texto com compress\~ao: Bit rate uncompressed text – bit rate compressed text
 Qde bits texto sem compress\~ao: Bit rate uncompressed text

3.2. MODULE DEVELOPMENT IN PYTHON

The development of the modules in Python language was carried out in the platform *Intergrated Development Environment* (IDE) PyCharm, in production on a computing platform with Windows 10 operating system. The following Python modules were implemented for entropy and compression calculation using encoding by the respective algorithms: Entropy; Shannon-Fano; Huffman; Arithmetic; Lempel-Ziv LZ 78. The modules developed can be found in the document Python Module Listings [Oliveira and Cavalcante 2021a].

4 RESULTS

Message compression tests were performed by the developed Python modules. The following Table 2 and Table 3 present a consolidation of the data extracted from the execution of the modules, contained in the document Python modules test results [Oliveira and Cavalcante 2021b]. The data exposed is the actual coding and measurement parameters exposed in the theoretical foundation of this work.

Table 2. Ascii message compression test (8 bits/symbol): demonstration for first amazon stem academy conference

Símbolos texto			Código Shannon Fano			Código Huffman			Código LZ78		
s	qde s	p(s)	Pal.-codigo	bits/s	tot bits/s	Pal.-codigo	bits/s	tot bits/s	Segmentos M	Pal.-codigo	bits/s
A	7	7/54	000	3	21	100	3	21	'DE'	00001100100	11
ESP	6	1/9	001	3	18	101	3	18	'MO'	00011101001	11
E	6	1/9	010	3	18	110	3	18	'NS'	00100001100	11
M	4	2/27	0110	4	16	0010	4	16	'TR'	00110101011	11
O	4	2/27	0111	4	16	0011	4	16	'AÇ'	00000110001	11
N	4	2/27	100	3	12	0100	4	16	'ÃO'	01000001001	11
S	4	2/27	1010	4	16	0101	4	16	'P'	00000001010	11
R	4	2/27	1011	4	16	111	3	12	'AR'	00000101011	11
T	3	1/18	1100	4	12	0111	4	12	'A'	00000100000	11
D	2	1/27	11010	5	10	00010	5	10	'FI'	00010100110	11
F	2	1/27	11011	5	10	01100	5	10	'RS'	00101101100	11
C	2	1/27	11100	5	10	01101	5	10	'T'	00110100000	11
Ç	1	1/54	111010	6	6	000000	6	6	'AM'	00000100111	11
Ã	1	1/54	111011	6	6	000001	6	6	'AZ'	00000101111	11
P	1	1/54	111100	6	6	000010	6	6	'ON'	00100101000	11
I	1	1/54	111101	6	6	000011	6	6	'S'	00000001100	11
Z	1	1/54	111110	6	6	000110	6	6	'TE'	00110100100	11
Y	1	1/54	111111	6	6	000111	6	6	'M'	00011100000	11
18	54	1,00	Tot. bits codificação ->		211	Tot. bits codificação ->		211	'AC'	00000100010	11
Texto sem codificação			Código	Comp.	Eficiência	Taxa					
Total de bits			Médio	(Form. 4)	Código	Compressão					
54 x 8 bits/s=432 bits			Shannon	3,9 b/s	99,21%	51,16%					
			Huffman	3,9 b/s	99,21%	51,16%					
Entropia do texto			LZ78	11 b/s	35,18%	31,25%					
(Fórmula 3)			Nota: O código LZ-78 não se utiliza da estatística da fonte, é baseado em dicionário (adaptativo)						'EN'	00010001000	11
H(P) = 3,87 bis/s									'CE'	00001000100	11
									Tot. bits codificação ->		297

TRADUÇÃO TABELA2:

Símbolos texto: Text symbols

Código Shannon Fano: Shannon Fano Code

Código Huffman: Huffman Code

Código LZ78: LZ78 Code

Qdes: qtts

Pal. – código: Code Pal.

Segmentos M: M Segments

Texto sem codificação: Unencoded text

Total de bits: bitrate

Entropia do texto (Fórmula 3): Text entropy (Formula 3)

Código: Code

Comp. Médio: Medium Comp.

Eficiência Código: Code efficiency

Taxa compressão: Compression ratio

Nota: O código LZ-78 não se utiliza da estatística da fonte, é baseado em dicionário (adaptativo): Note: The LZ-78 code does not use source statistics, it is dictionary-based (adaptive)

Although there were no errors in the compression tests performed according to Tables 2 and 3, in other tests some non-conformities were verified in the Entropy (probability totalization), Arithmetic (decimal to binary conversion error) and Lempel-Ziv LZ-78 (suppression of the last message segment coding) modules, which are already under analysis for elimination.

Table 3. ASCII Message Compression Test (8 bits/symbol): asadacasa

Símbolos texto			Código Aritmético		Código LZ78		
s	qde s	p(si)	Intervalo Codificado	Pal.-codigo	Segmentos M	Pal.-codigo	bits/s
a	5	5/9	[0.365896, 0.365928)	101110111	'as'	000011	6
c	1	1/9	Conv.Pal.-cód em Dec	Dentro	'ad'	000010	6
d	1	1/9	0,101110111 (2)=	Intervalo?	'ac'	000001	6
s	2	2/9	0.365910(10)	Sim	'asa'	010000	6
4	9	1,00	Tot. bits codificação ->	10		Tot. bits codificação ->	24
Texto sem codificação							
Total de bits				Código	Comp.	Eficiência	Taxa
9 x 8 bits/s= 72 bits					Médio	Código	Compressão
					(Form. 4)	(Form.5)	(Form. 6)
Entropia do texto				Aritmético	10 b/s	-	86,11%
(Fórmula 3)				LZ78	6 b/s	-	51,16%
H(P) = 1,65 bis/s			Nota: O código LZ-78 não se utiliza da estatística da fonte, é baseado em dicionário (adaptativo)				

TRADUÇÃO – TABELA 3

Símbolos Texto: Text Symbols

Código Aritmético: Arithmetic code

Pal. – Código: Pal. – Code

Segmentos M – M segments

Pal. – Código: Pal. – Code

Texto sem codificação: Unencoded text

Total de bits: bitrate

Entropia do texto: Text entropy (Formula 3)

Código: Code

Comp. Médio: Medium Comp.

Eficiência Código: Code efficiency

Taxa compressão: Compression ratio

Aritmético: Arithmetic

Nota: O código LZ-78 não se utiliza da estatística da fonte, é baseado em dicionário (adaptativo): Note: The LZ-78 code does not use source statistics, it is dictionary-based (adaptive)

5 CONCLUSION

The general objective of developing and making available tools for consolidating knowledge of Information Theory and Coding was fully achieved. During the work to achieve the general objective, the specific objectives listed in the Objectives section of this document were fully developed. Thus, the non-conformities mentioned in the Results section are already being worked on and the project can be considered concluded.

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CHAPTER 44

MIG PV Process: effect of negative electrode proportion on aluminum weld bead geometry

 [10.56238/pacfdnsv1-044](https://doi.org/10.56238/pacfdnsv1-044)

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ABSTRACT

The MIG (Metal Inert Gas) process with variable polarity is a relatively new process that can be applied in the welding process industry with high rates of productivity and competitive cost. The process uses compound curves of pulses in positive and negative polarities, and presents as main benefits in relation to the conventional process, high melting

rate, allied to low heat input, smaller deformations and better control of penetration and dilution. The objective of this work is to analyze the effects of the proportions of the negative polarity (%EN), of the typical current curve of the process, seeking to relate with the penetration and dilution of the resulting weld bead. Three levels of %EN percentages of 0%, 30% and 50% were used for the study. Weld beads were made in the flat position (1G), depositing ER5356 aluminum onto the free surface of Al5052-F sheet. The negative polarity parameters used were compared with different forms of calculations proposed in the literature for determining the value of the negative electrode ratio. It is suggested that for the calculation of the negative electrode ratio (%EN), all parameters of the curve (currents and times) should be considered in order to obtain an effective comparison of the %EN levels. It was concluded that increasing the proportion of negative electrode causes decreased penetration and dilution in the weld bead.

Keywords: MIG Variable Polarity, Negative Electrode Ratio, Aluminum Welding.

1 INTRODUCTION

With the advent of manufacturing processes, especially after the consolidation of the large-scale production process, the need to join similar or dissimilar materials has become increasingly necessary. In this context, welding has emerged as a great ally for the elaboration of projects and the creation of products that increasingly demand research and technology, especially in the area of metals.

There is today, in the industrial sector, a predominance, when we talk about welding process, in the use of the electric arc method, being MIG/MAG the most widely used, both for coating and filling. The MIG/MAG process was patented in 1930 by Hobart and Devers and called GMAW (Gas Metal Arc Welding) [1], and nowadays, it is widely used worldwide, being the main welding method used [2]. The MIG/MAG process presents a range of advantages, such as a high rate of productivity, a considerable and unquestionable quality of the weld bead allied to a moderate cost of production of the process.

With the constant increase in demand for productivity, the need arose for the welding process to become more flexible and the optimization and constant improvement of the MIG/MAG process caused its

variant called Variable Polarity to become widespread in the production process. This process has as its main characteristic the high rate of material fusion.

There is, however, a problem in the MIG/MAG PV process that is precisely the adjustment of the six parameters of the current curve, which generate welding welds in satisfactory conditions, this is basically by the method of trial and error to the point where it reaches a gap of parameter

values that meet expectations [3]. Basically the variables changed in each of the parameters of the work were: Negative pulse time (T_n) in (ms), Negative pulse current (I_n) in (A), and base current time (T_b) in (ms).

In particular, in this work they sought to understand how the process parameters affect the characteristics of the weld bead, which are penetration and dilution, important parameters when it comes to surface coating by welding, also in root pass.

For this, the welding process MIG/MAG Variable Polarity was chosen to perform the weld beads since it allows the accurate control of the characteristics of the weld bead. This process provides the best control of penetration, less dilution and as an advantage, less distortion [3].

The present work aims to evaluate the effect of negative polarity parameters (time and intensity) through negative polarity ratios (%EN) on weld bead geometry (penetration, height and width) and dilution.

2 THEORETICAL BACKGROUND

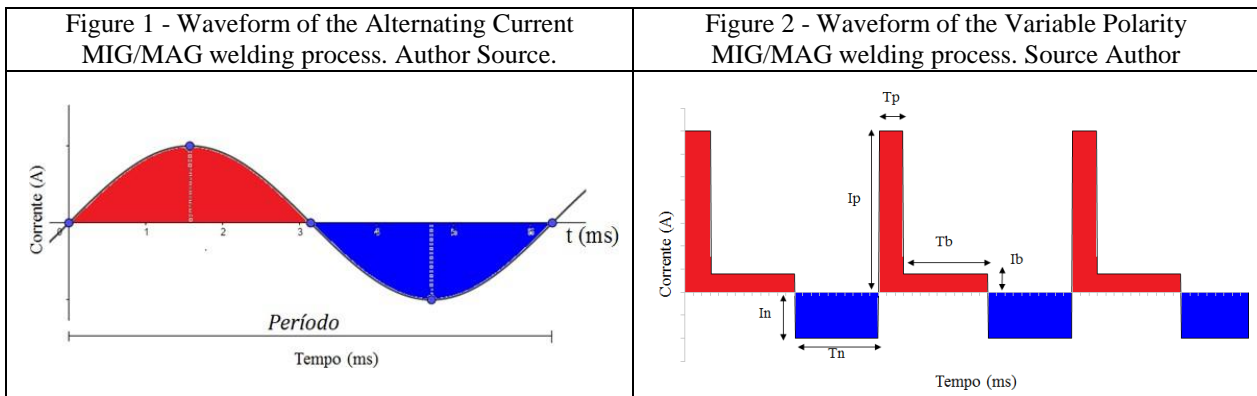
2.1 MIG/MAG WELDING PROCESS VARIABLE POLARITY

The MIG/MAG process is one of the most used welding processes today for the production of weld beads in large extensions, as in the coating of surfaces, resistant to wear, corrosion, heat, among others. However, normally some problems are encountered, especially in the coating done by welding, such as high fusion of the base metal that produces high dilution and distortions. The MIG/MAG welding process using an alternating current would be ideal to solve some of the difficulties listed above [4].

Two distinct nomenclatures are defined in the literature: pulsed alternating current (AC) or variable polarity (PV). Both forms of nomenclature are related to the use of negative polarity in the welding process [1]. However, alternating current is linked to the sine waveform, where the positive and negative parts are very close, of equal magnitude. Therefore, the expression variable polarity is more related to waveforms with variation between the polarities, positive and negative in the welding current curve, and may contain more time and intensity in its positive part, or similarly in the negative.

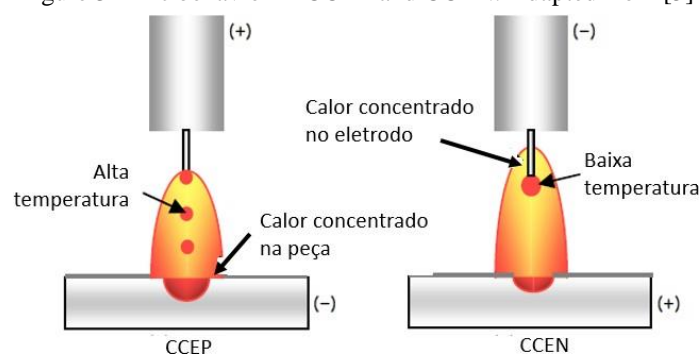
Currently two different nomenclatures are recognized: the alternating current (AC) waveform can be seen in Figure 1 and the variable polarity definition (Figure 2). Both nomenclatures bring with them the concept of using negative polarity during part of the welding, which allows the welding of thin sheets [1].

In Figure 1 you can see the waveform for the MIG/MAG welding process Alternating Current (AC) is used to describe a sine wave. Also to describe a current that alternates between positive and negative polarity. The term alternating polarity relates to waveforms with varying positive and negative polarity in the welding current curve, whereby the time and intensity can be adjusted in its positive part, or likewise in its negative part. The MIG/MAG welding process Variable Polarity (Figure 2) is used to describe pulsed waveforms (alternating in polarity) in which the ratio between the two polarities can be varied and the "negative electrode ratio - %EN" is used as the process parameter.



The negative polarity, direct current and negative electrode (CCEN), drastically changes the behavior of the MIG/MAG process, changing the distribution of energies between the electrode and the workpiece. In Figure 3, in the process positive polarity, constant continuous current and positive electrode (CCEP), the highest concentration of heat happens in the workpiece, greater penetration, one can work with various modes of transfer [5]. However, in negative electrode (CCEN), this situation is inverted and most of the heat is concentrated in the electrode, and with this occurs an increase in the fusion rate, increased arc voltage, decreased temperature in the workpiece and reduced penetration, also affecting the transfer mode that in most cases is globular.

Figure 3 - Arc behavior in CCEP and CCEN. Adapted from [5]



The use of direct current and negative electrode (CCEN) compared to conventional MIG/MAG presents lower temperature values on the part [4]. As a result, they verified a reduction in the deformation of the final part, as well as less penetration and dilution. This benefit was also proven by [6], who verified a reduction in the temperature of the welded part with the increase in the use of the negative electrode.

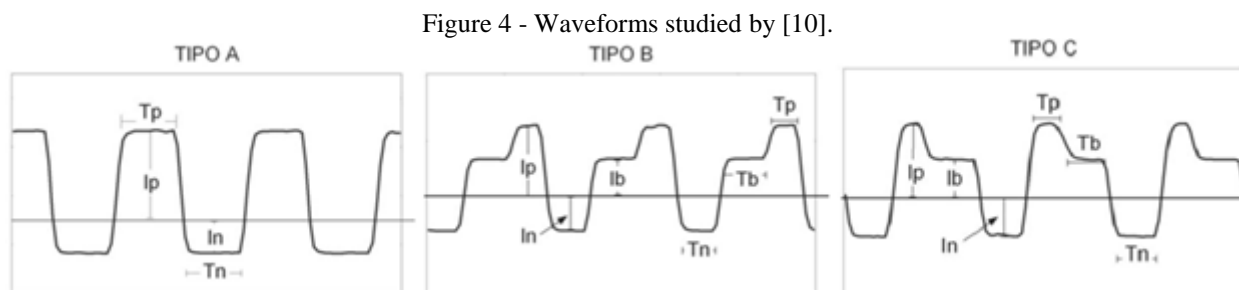
In the PV MIG/MAG process, it is possible to obtain higher fusion rate, coupled with low temperature in the base metal generating great instabilities in the electric arc and in the metal transfer from the tip of the electrode to the fusion puddle, in the vast majority of situations making it impossible to use CCEN in the MIG/MAG process. The instability is explained by [7] mainly by the metal transfer mode, which is limited to globular mode for CCEN. But to minimize the arc instability and thus utilize the benefits of the negative electrode, such as reduced penetration, reduced temperature in the base metal, the positive electrode is applied to the process, which brings with it the arc stability. According to [8], each polarity presents a heat balance, but combined they allow control of the heat of the workpiece and electrode, as well as control of penetration, and according to [9], this combination generates low temperatures allied to increases in the productivity rate in the welding process.

2.1.1 MIG/MAG PV process waveforms

In the Variable Polarity MIG/MAG welding process the current waveform is currently a widely explored topic, [10] studied three waveform variations, seeking to understand the relationship between the shape of the curve and the weld bead geometry. The studied waves are listed in Figure 4.

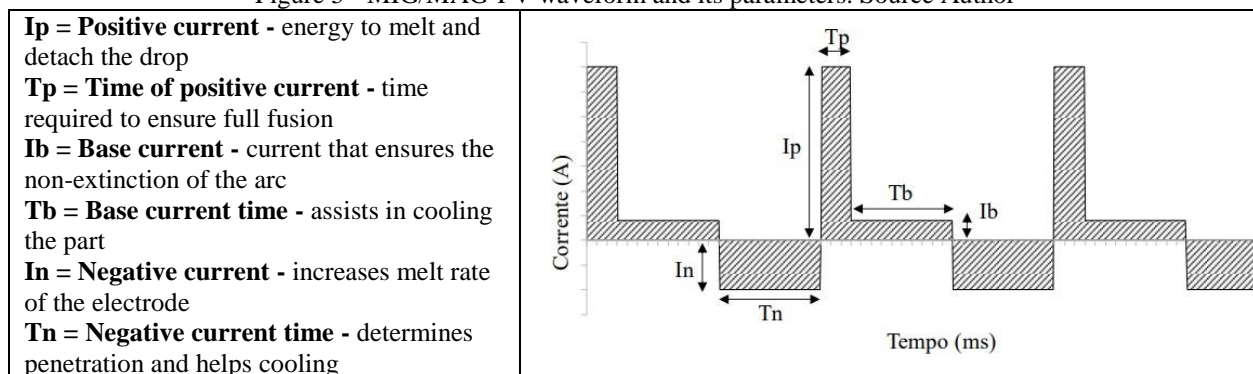
The base current is critical for severe polarity changes, and prevents spatter in the welding process [11].

The three types of waves contemplate, not using the base time (type A), using the base time before the positive peak current (type B) and the base current after the positive peak (type C). The results obtained showed that the waveform has no significant influence on the weld bead geometry, but there is a significant effect of the interaction of the weld bead geometry with the negative polarity parameters.



The current curve of the Variable Polarity MIG/MAG process has three parts: positive pulse, positive base and negative pulse. As shown in Figure 5, the waveform of the PV MIG/MAG welding process, formed by the positive part, which contains four parameters: peak current (I_p), peak time (T_p), base current (I_b), base time (T_b), and the negative part: negative current (I_n) and negative current time (T_n).

Figure 5 - MIG/MAG-PV waveform and its parameters. Source Author



According to [4], a positive base current with a duration of approximately 1.5 ms before or after the detachment pulse (Positive Peak Current), recommended for aluminum welding, is a mechanism that allows the bead to reach the fusion puddle free of repulsive forces, thus minimizing or avoiding spatter. The stepping of the base current, before and/or after the detachment pulse, assists in mitigating the rapid polarity reversal and in stabilizing the arc [12].

2.1.2 Proportion of negative polarity (%EN)

Along with the use of the equation for the proportion of negative polarity, the following authors [4, 10, 12-14] use penetration as an object of study, seeking improvements in the processes, so for example, to improve root passes, closing of gaps between plates or welding for coating, where there is need for greater control of penetration in the welding process. And the understanding of the effects of the negative electrode through only one factor (%EN), would make the variable polarity applicable on an industrial level.

The current curve in Figure 5 consists of pulses formed by six different parameters. The choice and understanding of these six different parameters make the process of parameterization, i.e., the proper combination of parameter values for the desired response, quite complex. For this reason, many authors use a factor that represents the percentage of negative polarity in relation to the total current curve, called electrode negative percentage (%EN), which is used to understand the variation of negative polarity in relation to the variables of the welding process, such as penetration, dilution, temperature, among others. The %EN ratio is found from the literature in two different ways of calculation according to Equations (1) and (2).

The ratio calculated according to Equation (1), considers the composition of the time and intensity of the negative current relative to the total current waveform in the period. In summary, the %EN term

compares the area of the current curve as a function of time ($I \times T$) of the current in the negative part relative to the total area of a pulse cycle. This type of calculation has been used by [5, 6, 10,13, 15, 16].

$$\%EN = \frac{I_n \times T_n}{(I_n \times T_n) + (I_p \times T_p) + (I_b \times T_b)} \times 100\% \quad (1)$$

However, a second way to calculate the percentage of negative electrode can be found in the literature. This considers only the times between polarities, with the response being the proportion of the negative current time (T_n) in relation to the total pulse period (T), this being the sum of the base current time (T_b) and positive peak (T_p) and the negative current time (T_n). This calculation method has been used by [9, 11, 12 14, 17-19].

$$\%EN = \frac{T_n}{T_n + T_p + T_b} \times 100\% \quad (2)$$

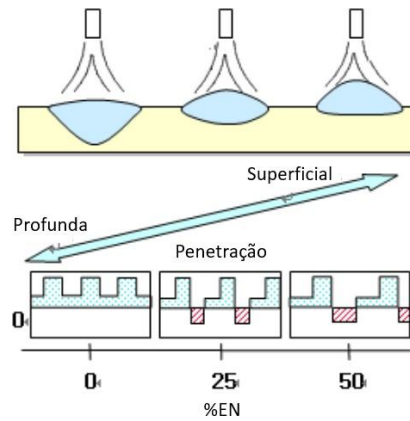
Essentially, the difference between the two ways of calculation, shows that in Equation (1) the %EN is calculated considering all six parameters of the current curve, while in Equation (2) only the current action times and not their respective intensities are considered. Considering an arbitrary set of values of these six parameters, depending on whether Equation (1) or Equation (2) is used, one can arrive at different %EN values.

However, as presented by [10,15], who used Equation (1), or as demonstrated by [12], using Equation (2), the higher the value of the proportion of negative electrode (%EN) the lower the penetration values obtained.

In general, the increase in the percentage of negative polarity in the current curve generates a reduction of penetration in the weld bead geometry. This condition is represented by [15] in

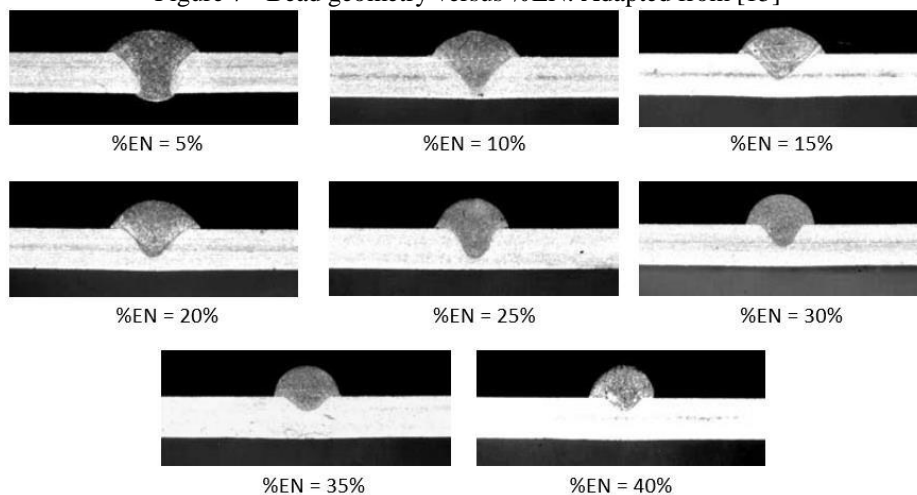
Figure 6, where the increase in the percentage of negative polarity is illustrated, considered by the value of %EN between zero and 50%, and in turn the effects on penetration and characteristic of the weld bead.

Figure 6 - %EN versus Penetration. Adapted from [15]



Experiments were performed by [15] with aluminum wires and pure argon shielding gas, thin aluminum plates from 1 to 2 mm thick, varying the %EN between 5% and 40%, with the objective of controlling penetration in the welding process. Figure 7 illustrates the results of the cross sections of the weld bead, which clearly show a reduction in penetration and width with increasing %EN, as well as an increase in the height of the weld bead.

Figure 7 - Bead geometry versus %EN. Adapted from [15]



3 MATERIALS AND METHODS

The experimental part was developed in the Welding and Allied Techniques Laboratory of the Technology Center of the UFRGS. The welding source used was the DIGIPlus A7 450. For the torch conduction, a CNC orbital welding robot, Tartilope V4, was used to ensure the advancement and speed control, as well as the maintenance of the contact tip-workpiece distance (DBCP), everything was properly aligned with the aid of a level so that the system was horizontal.

The data acquisition was done by the equipment of IMC Welding, the SAP4.01 that collected the values of current and voltage at a rate of 5000 samples per second. The values of current and voltage were acquired by the SAP 4.01, equipment from IMC Welding (same manufacturer of the power source), which

collected and stored the data, besides showing instantaneous graphs during the execution of the weld bead. Figure 8 shows the equipment used in the experiment.

The weld seams were deposited on AA5052-F aluminum plates of dimensions 150x100x7.9 mm, the filler metal used was ER5356 of 1.2 mm diameter. The weld beads were deposited on the bead-on-plate in the flat position (1G). The chemical composition of the base metal and filler metal are described in Tables 1 and 2, respectively.

Figure 8 - Welding equipment on the left, Tartilope in the background, and acquisition equipment on the white table on the right.



Table 1 - Chemical composition of the base metal (%).

League	Zn	Mg	Ass	Al
Al5052-F	-	2,5	-	Rest

Table 2 - Chemical composition of the filler metal (%).

Material	Si	Fe	Ass	Mn	Mg	Cr	Zn	Ti	Al
ER5356	0,25	0,4	0,1	0,2	5,0	0,2	0,1	0,2	Rest.

Some parameters were previously set and kept constant during the experiment, such as torch offset angle of -5° (pushing, the melt puddle in front), feed speed of 4 mm/s, wire feed speed of 6.0 m/min, commercially pure argon shielding gas, shielding gas flow rate of 15 l/min and DBCP of 18 mm.

Table 3 lists the parameters used for the three conditions of negative electrode ratios (% EN), obtained from equation (2), which considers the actuation times of each polarity, used during the depositions.

Table 3 - Current parameters and times of the waveform from Figure 5, Negative Electrode Percentage determined with Eq. (2).

Parameter	Negative Electrode Percentage		
	0% EN	30% EN	50% EN
Ip (A)	300	300	300
Tp (ms)	1,5	1,5	1,5
Ib (A)	60	60	25
Tb (ms)	7,3	4,6	2,9
In (A)	0	47	47
Tn (ms)	0	2,6	4,4

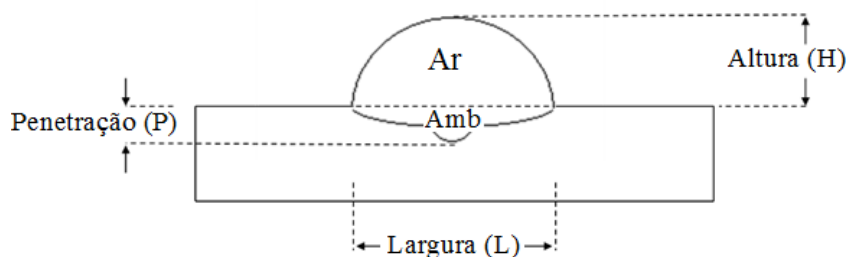
3.1 MATERIALS FOR CHARACTERIZATION OF WELD SEAMS

From each of the three slabs used, four samples of the cross-section were taken, one for each pass increment, using the Cut-off machine. These samples were embedded with self-curing acrylic, to avoid problems during grinding and to increase the efficiency of the step. Following preparation of the samples they were sanded in grits 120, 220, 320, 400, 500, 600 and 1000, making sure to start all samples in the same direction and to rotate the sample 90° at each change of sanding grit size.

The cross sections for the macrographs were attacked with Keller Reagent, which, according to ASTM E340, is a mixture of hydrofluoric acid, concentrated hydrochloric acid, concentrated nitric acid, and distilled water. All the attacks were done in a chapel and with appropriate safety equipment. The macrographs were obtained using a microscope with an 8x magnification lens and analyzed using the free software ImageJ, with which the response variables were measured: addition metal area (Ar), base metal fused area (Amb), penetration (P), weld bead width (L) and reinforcement height (H), as shown in Figure 9.

In addition to the geometrical characteristics mentioned above, the beads were also evaluated qualitatively for other aspects such as spatter level, visible pores in the cross section of the weld bead, and overlap defects.

Figure 9 - Schematic of the bead-on-plate free weld bead and the response variables.



4 RESULTS AND DISCUSSIONS

This section presents and discusses the results of the work, obtained through the analyses performed on the geometry and other pertinent aspects of the strands in relation to the percentage of negative polarity (% EN).

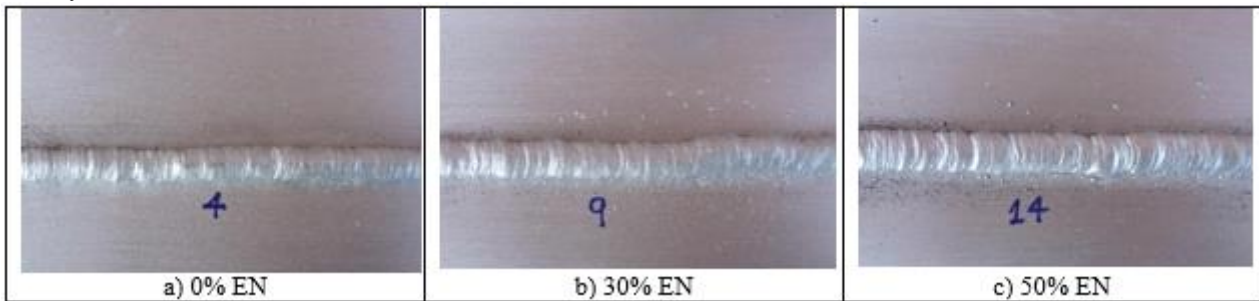
4.1 VISUAL ASPECT OF THE WELD BEAD

The level of spatter was visually evaluated through images (photos) taken after the weld bead was made. Spatter represents less material being deposited on the weld beads, it also affects the visual quality, and if cleanup is required it adds cost to the welding process.

Higher process expenses as less material is deposited on the weld bead and more time is required in fabrication. A significant increase in the amount of spatter was easily noticed with increasing %EN, as can be seen in Figure 10.

Several authors have stated and proven that the negative electrode generates instability in the arc. This usually happens due to the suspension of the droplet formed at the tip of the electrode, creating an asymmetric magnetic field that acts on the droplet in an unpredictable manner [20].

Figure 10 - Visual appearance of the spatter level for the Variable MIG-Polarity process with 0% EN, 30% EN and 50% EN, respectively.



4.2 WELD BEAD GEOMETRY

Table 4 shows the geometrical parameters obtained after the analysis of the samples (cross section of the weld bead), which are respectively the welded area of the base metal, area of the reinforcement, dilution, penetration, width and height of the weld bead. The weld seams were made with the materials and parameters of the MIG PV process from Tables 1, 2, and 3. The results in Table 4 were obtained by measuring the samples using ImageJ software.

The value of %EN' calculated with Equation (1) considers all six parameters of the current curve, while in Equation (2) only the current action times and without their respective current intensities are considered. Table 5 shows the ratio of the negative proportions calculated by Equation (1) and Equation (2).

Table 4 - Geometric parameters obtained for the negative electrode percentage (%EN) values.

Parameters	Symbol	0% EN	30% EN	50% EN
Penetration	P (mm)	0,92	0,71	0,57
Reinforcement Height	H (mm)	3,96	4,04	3,98
Width	L (mm)	7,32	7,79	7,39
Dilution	D (%)	7,66	4,12	4,05
Reinforcement Cast Area	Air (mm ²)	26,72	28,40	24,97
Base Metal Area	Amb (mm ²)	2,05	1,17	1,01

Table 5 - Negative electrode percentage values obtained from equations (1) and (2).

Equation (2)	Equation (1)
%EN	%EN'
0% EN	0% EN'
30% EN	14.4% EN'
50% EN	28.4% EN'

Figures 11A, 12A and 13A show the macrographs of the weld beads obtained for 0% EN, 30% EN and 50% EN, respectively. Meanwhile, Figures 11B, 12B and 13B show the oscillograms of the welding current as a function of time obtained for the 0% EN, 30% EN and 50% EN negative electrode percentages, respectively.

The three macrographs show the presence of overlap, that is, there is no fusion of the base metal, there are also some pores (not quantified) in the weld bead. The argon as shielding gas is a gas with low thermal conductivity, which provides higher energy in the central region of the weld bead and less energy as the distance in the radial direction of the arc increases.

Figure 11A - Macrograph of the cross section of the weld bead obtained with PV 0% EN MIG.

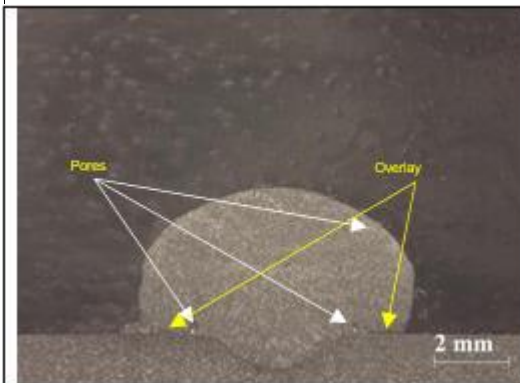


Figure 11B - Welding current waveform as a function of time, MIG PV 0% EN.

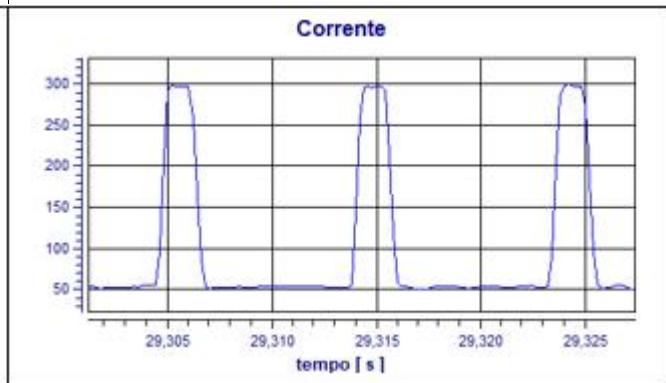


Figure 12A - Macrograph of the cross section of the weld bead obtained with MIG PV 30% EN.

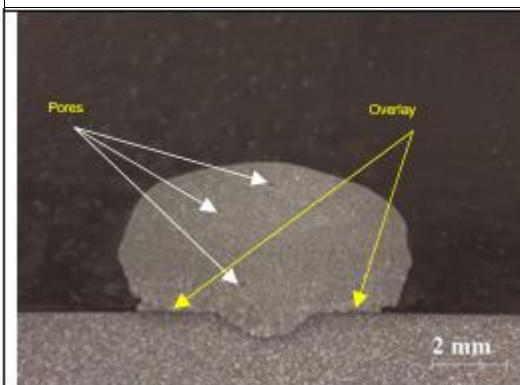


Figure 12B - Welding current waveform as a function of time, MIG PV 30% EN.

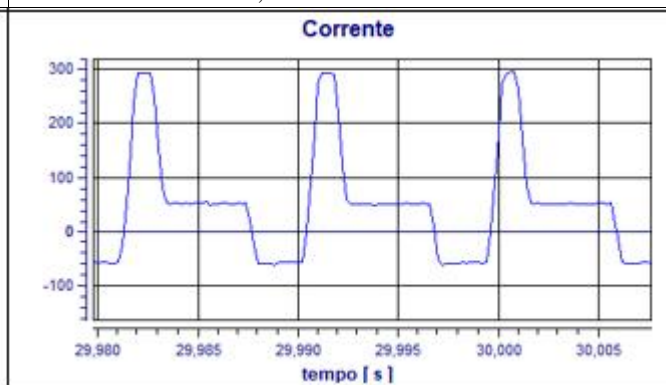


Figure 13A - Macrograph of the cross section of the weld bead obtained with PV 50% EN MIG.

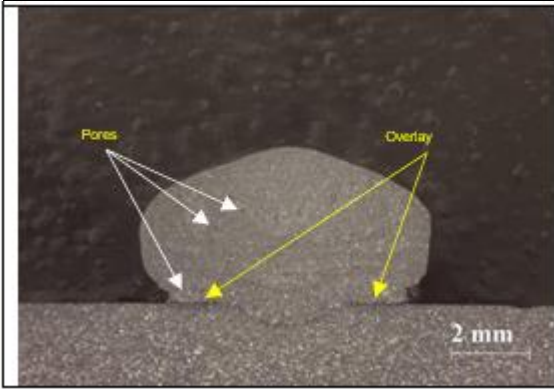
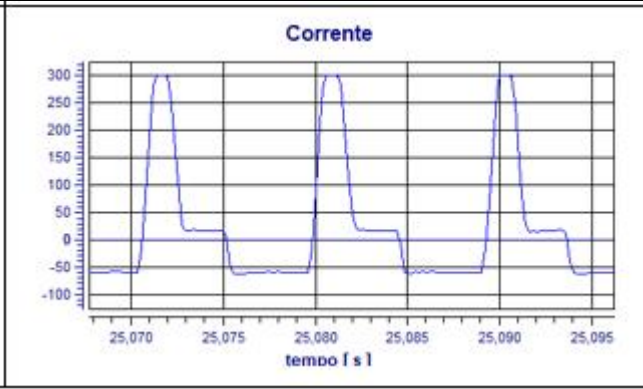


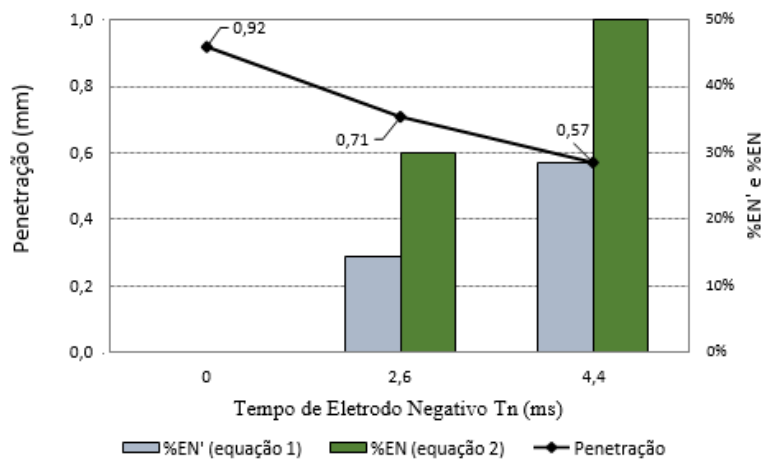
Figure 13B - Welding current waveform as a function of time, MIG PV 50% EN.



The penetration (P - mm) was measured considering the maximum distance to the center line of the base metal. It was added to the graph the proportions of negative polarity, %EN, considering the two forms of calculation [Equation (1) and Equation (2)], where it can be verified the relationship presented in the literature, regardless of the equation used, there is a reduction of penetration with the increase of %EN.

Figure 14 shows the relationship between the percentage of negative electrode (%EN) and the weld bead penetration. The analysis of this response variable is of utmost importance for the MIG PV process, because according to the literature the greater presence of negative polarity in the process results in lower penetration in the weld bead, as presented by [15], that is, the negative polarity can be used to control the penetration and the fusion rate of the welding process.

Figure 14 - Penetration versus negative electrode time addition (Tn) and the percentage of negative electrode (%EN' and %EN) calculated by the two equations (1) and (2) proposed in the literature.

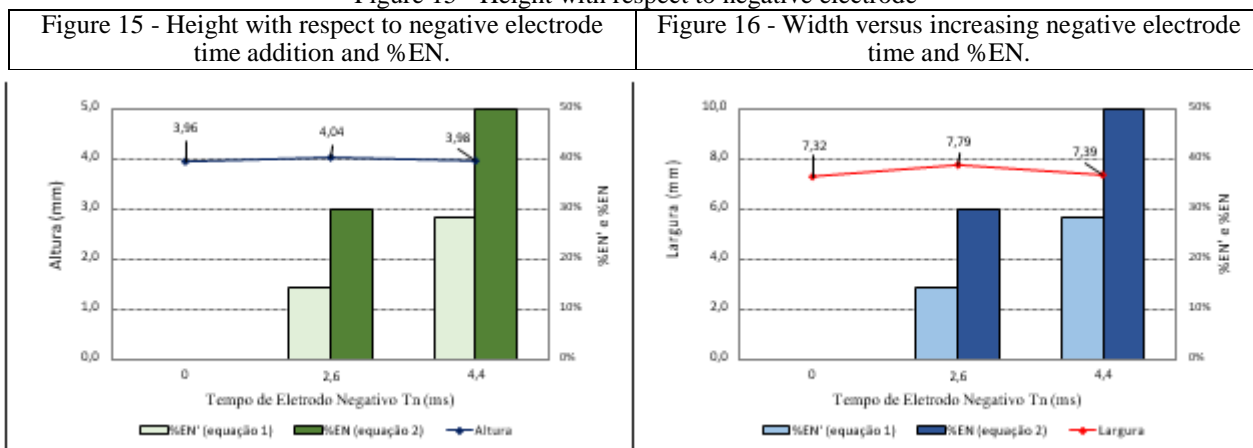


The reinforcement height (H - mm) was measured considering the maximum distance to the center line of the base metal. The variation of the electrode negative percentage (%EN) has no significant effect on the height. By keeping the wire feed speed constant at 6.0 m/min and the welding speed constant at 4.0 mm/s, it means that the amount of filler metal deposited per unit length should be constant. Figure 15 shows

that the height of the weld beads does not differ significantly among the %EN values used in welding, less than 2%.

In Figure 16 it can be seen that the weld bead width does not differ significantly among the %EN values used in welding, approximately 6.0 %.

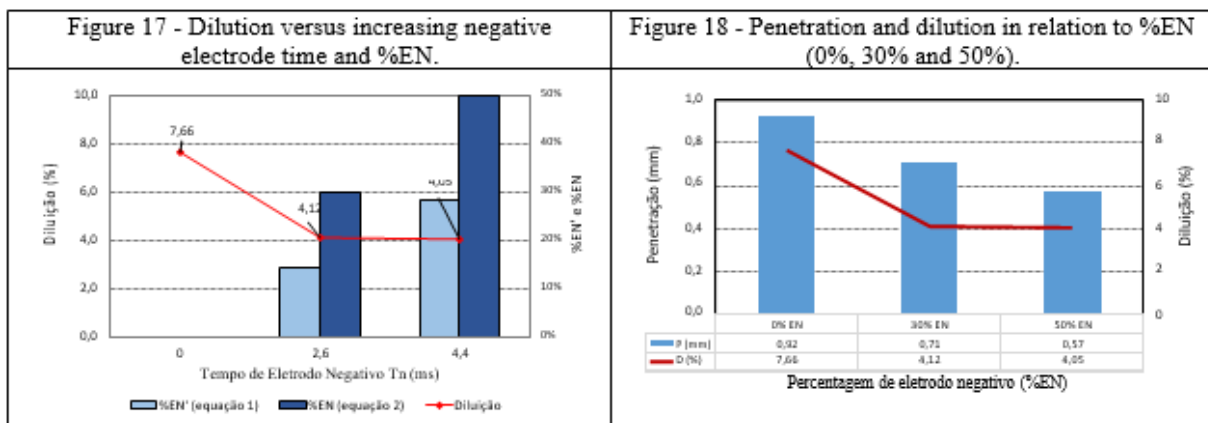
Figure 15 - Height with respect to negative electrode



The low values of dilution (D - %), as well as the overlap observed in the weld bead, may be related to low values of welding energy and high thermal conductivity of the base metal. By the characteristics of the MIG PV process (see Table 4 and Figure 17) the values of dilution of the weld beads found were very low, less than 10%, for 0% EN presented the highest values, about 185% compared to the second highest dilution, 30% EN. According to [21], for surface coating obtained by the arc welding process, very similar to the bead-on-plate welding employed here, dilution values between 10 and 15% are ideal.

This can be explained by the effect of the negative current in the process, due to its higher melt rate and lower heat input, as presented by [14], generates a larger area of filler metal.

In Figure 18 it can be seen that penetration and dilution vary inversely with the percentage of negative electrode, that is, as %EN increases there is a decrease in penetration and dilution.



5 CONCLUSION

- When analyzing the data obtained during depositions with different negative electrode ratios, regardless of the %EN calculation employed, an increase in %EN causes a decrease in penetration and dilution.
- The number of defects found was large, the porosities need to be investigated, as well as the overlap of the filler metal on the base metal. The deposited weld beads showed spatter and qualitatively there was an increase in spatter with increasing %EN.
- The results obtained were satisfactory, showing potential for new research to be done on the subject, which is vast and with many questions still to be answered.


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CHAPTER 45

Supervening impossibility of provision in times of pandemic

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ABSTRACT

The present study aims at the doctrinal survey of the situations in which the theory of supervening

impossibility of provision was invoked considering the global pandemic scenario by COVID-19. To this end, we seek to differentiate the proposed theses to address the situations in which the provision suffered an unpredictable obstacle due to the mandatory social distancing, with the limitation of several activities, causing a considerable crisis in contractual relations.

Keywords: Supervening impossibility of Obligation, Excessive Onerosity, Fortuitous Event or Force Majeure, Frustration of the contract purposes.

1 INTRODUCTION

The theme of supervenient impossibility of provision became even more vivid and controversial after the occurrence of the global pandemic caused by COVID-19. Thus, situations that were absolutely unexpected and without judicial precedent became a common subject in the legal community and its confrontation of the matter in the Brazilian courts proved to be completely heterogeneous, with diverse judicial solutions and little technical grounding.

Our legal system lacks convincing solutions to accommodate long-lasting contractual relations in the case of supervening circumstances that may affect the basis on which the obligatory relationship between the parties was built.

2 LIMITS OF THE BINDING OF THE PARTIES TO THE OBLIGATIONS ASSUMED

In order to contextualize the theme, it is necessary to approach the concept of obligations and their evolution, especially to verify the elasticity of the pacts assumed between the parties according to the specificities of the historical, social, and legal conjuncture at the time of their conclusion - so that we can identify what are the possible justifications to adapt the fulfillment of the obligation assumed, considering the impacts of external and unpredictable situations.

According to most of the doctrine, from the classic concept of obligation three constitutive elements are extracted: subjects, object and bond. However, the interpretation of the term "obligation" goes beyond the mere verification of its three constitutive elements, as it characterizes a relationship as a whole, so that it becomes necessary to verify the existence of a bond between the parties that takes into account its essential cause from which the desire of the parties to contract was born, as well as its specific object and purpose.

In the words of Couto e Silva, "*the obligation is a process (...). It would not be possible to define the obligation as a dynamic being if there were no separation between the level of birth and development and the level of fulfillment*" . It is exactly when one considers the complexity of the obligatory relationships, from its forming source until its conclusion, that currently it becomes relevant its compression within a legal system as a whole - which has important ponderation and safeguard to the basic legal principles, such as good faith, loyalty, cooperation, social function, human dignity, among others.

As Adriano Ferriani has well observed, "*in current times, the existential dimension of the human being has been acquiring more and more relevance, in consideration of the dignity of the human being (article 1, III, of the Federal Constitution). Such conception interferes directly in private relationships, and it is no longer possible to state, peremptorily, that the creditor has a power against the debtor, as it used to be said. The bipolarity and antagonism of interests give way to the cooperation that should guide any bond relationship*" .³

It continues:

Under the economic aspect, an obligation continues to be an obligation, that is, the creditor continues to have the right to require the debtor to fulfill it (...). It is necessary, however, to pay attention to the economic interest of the creditor without disregarding other values, social and existential, of extraordinary importance, which are protected by the legal system (Federal Constitution and infraconstitutional rules) and may interfere in the very structure of the obligation.⁴

Within this legal order there is an undeniable "*characteristic absorbed by private law, echoing the various other mutations of the legal system, from the constitutional root*"⁵ - it is not possible to ignore this characteristic, aiming at the interpretation of civil law in order to adapt it to reality and striving for its harmonization with the facts of life, so that social welfare and the protection of unassailable constitutional principles are achieved, such as the dignity of the human person and other constitutional guarantees that derive from it (FERRIANI, p.32).

Under this view, in exceptional moments, such as the global pandemic by COVID-19, the enforceability of the obligations assumed must go through *the necessary evaluation of the specificities of the case, in order to "be individualized, without prejudice, the normative to be applied through an autonomous and unitary procedure of interpretation and qualification of the causative fact, its effects, voluntary and/or legal, respecting the peculiarities and the real interests and values involved"*⁶ .

Thus, the analysis of the disturbances to the fulfillment of obligations should be carried out in association with the search for the preservation of contractual relations in consonance with their social function, as well as in prestige to the good faith and loyalty of the parties, seeking an equitable solution to the impasses arising from a situation as exceptional as this pandemic event.

3 RISK THEORY

The supervening impossibility of the provision has as its essential effect the extinction of the bond of obligation, with the exoneration of the debtor, without having to respond for any compensation for losses and damages. In this sense is the teaching of Ruy Rosado, who explains "*The supervening impossibility that cannot be imputed releases the debtor and discharges him from repairing the losses, since there is no delay on his part (article 396 of the Civil Code), for which reason the creditor is not entitled to invoke article 475 of the Civil Code to terminate the relationship and claim indemnification. There is ipso jure extinction*"⁷ .

Attention should be paid to the necessary assumptions for the debtor to be released from the obligation by supervening situation, so that the impossibility to fulfill the obligation must be effective, absolute and definitive (MENEZES CORDEIRO, 1986, p. 174). More than that, for Wayar, besides being absolute, definitive and supervening, the impossibility must also be unimputable to the debtor⁸ . The supreme principle of imputation - at least for the assumptions of impossibility regulated in the Brazilian Civil Code - is that of guilt.

In the same sense, Pontes de Miranda states that the supervening impossibility that frees is only the absolute one (MIRANDA, v.22, p.69), and that, in the Brazilian legal system, the supervening impossibility may be with or without fault of the debtor, so that if the debtor is guilty, articles 234 *in fine*, 236, 239, 248 *in fine*, 250 of the Civil Code apply (MIRANDA, v.22, p.68), which reveal that without fault the principle of liability of the debtor who fails to comply does not prevail. The solution advocated by Pontes de Miranda, if it does not clash with the principles regarding the impossibility when examined separately from the texts, will undoubtedly hurt the rule of art. 963), according to which "*if there is no fact or omission attributable to the debtor, he is not in default*". Therefore, default may only occur when there is a fact or omission attributable to the debtor.

In this sense the debtor's release - or extinction of the bond relation - would be equivalent to the declaration of ineffectiveness of an originally valid obligation, triggered by natural force (unforeseeable circumstances or force majeure) or by legal force - the differences between which we will analyze below.

For Couto e Silva, in order to verify the impossibility of the provision that releases the debtor, it is necessary to analyze who bears the risks of the perishing of the obligation

- which forces the distinction between obligations arising from bilateral and unilateral contracts⁹ . For the author, in the case of bilateral contracts, the risk is borne by the debtor. However, in the transfer of ownership of movable property, the risk is only transferred from the debtor to the creditor (purchaser) with the tradition, as can be seen in article 492 of the Civil Code. In unilateral contracts, on the other hand, the principle is that the risks are borne by the creditor, since the debtor does not lose against the creditor, who no longer owns the thing.

In conclusion, one can see that the distribution of risks is intrinsically related to the types of obligation (to give, to do, not to do), in the sense that the impossibility of release requires the absence of

guilt (read imputability) on the part of the debtor.

This theory of risks was increased in our Civil Code by the inclusion of a species of release from obligations arising from acts of God and force majeure, which, despite being under different headings in our legal system, result in the debtor's release, with the extinction of the bond, as discussed below.

4 IMPOSSIBILITY OF RENDERING

The options that differentiate the types of impossibility of the provision were not well reproduced in the Brazilian Civil Code, and it is up to the doctrine to present studies to better dissect the theme. Thus, the doctrine adopts four classifications of the impossibility of the provision: (i) absolute or relative, whose criterion depends on the evaluation of the true impossibility of the provision or only a difficulty in the exercise of its fulfillment; (ii) objective or subjective, which has the criterion of verifying where the impossibility is located, whether in the object or in the subject to be provided; (iii) definitive or temporary; (iv) integral or partial, as to the extent of the impossibility of the provision.

Absolute impossibility is said to be the provision that cannot be performed - it is not a matter of mere difficulty in complying with the provision, there must be material impossibility (physical or legal), regardless of the will of the parties and without conditions to be replaced know the object, nor the debtor who should comply. For this reason, it is said that the provision is only truly considered impossible when it becomes absolutely impossible¹⁰.

In turn, the impossibility of the provision is *relative*, which, despite the supervening event, can still be performed if its subjective aspect is altered, while the object of the provision remains viable - in other words, it is not exactly an impossibility, since there is no loss of the obligatory object, it is enough to change who can perform it to subsist.

For Judith Martins-Costa (MARTINS-COSTA, 2020, p. 165), relative impossibility would be that provision, although possible, with greater difficulty to be fulfilled by the debtor; or, in the words of Gomes da Silva, "*that which derives from an obstacle that cannot be overcome except with efforts and sacrifices to the degree considered typical, that is, greater than the average diligence in certain obligations*"¹¹.

It should be noted here that mere economic difficulty in the debtor's performance (a *difficultas praestandi*) does not even constitute hypothesis of relative impossibility.

Precisely because it is relative, most legal scholars believe that this type of impossibility does not release the debtor. Pontes de Miranda, Clóvis do Couto e Silva and Ruy Rosado de Aguiar Júnior are in opposition to such current, for whom "*the extraordinary difficulty, or disproportionate, is considered impossibility, the provision that would be exorbitant is considered impossible, if the debtor himself did not assume (...) It is the effectiveness of the impossibility by disproportionality*"¹².

Objective is the impossibility that reaches the mediate object - the content of the provision - of a given legal relationship of obligation, because, although the debtor can still provide it, its object becomes impossible due to natural, physical, normative and institutional conditions. By its content, this

classification refers to the obligations to give and to restitute. In logical conclusion, one cannot admit that obligations defined by genre and by quantity may be considered impossible by a supervening event, since the genre of a certain object does not perish as a whole, the obligation to deliver or restitute it remaining possible. The same is said with regard to alternative obligations, since it would also be inadmissible that all the options of the adjusted installments perish, making the fulfillment of the obligation unfeasible: in the absence of one, he will have to perform the fulfillment of the installment by another.

The *subjective impossibility*, on the other hand, refers to that which affects the subject of the legal relationship of obligation, which occurs when the debtor becomes unable to comply with the provision due to a supervening situation, even if the object of the provision is shown to survive. As a rule, the impossibility of the original debtor of the legal relationship of obligation to comply with the agreed provision configures a relative impossibility of the provision - there is not, therefore, a true impossibility, but rather an impossibility of the original debtor to provide it. Only if the obligation is characterized as being *intuitu personae*, will there exist a subjective impossibility, entering into the classification of absolute impossibilities. According to Almeida Costa "the objective impossibility is equated to the mere subjective impossibility, in the event the debtor cannot be replaced by a third party in the fulfillment of the obligation"¹³. If, on the other hand, the provision is fungible, only the objective impossibility constitutes an extinctive cause of the bond.

Under the temporal aspect, the classification of the impossibility may be *definitive* or *temporary*. In fact, only the former concerns the thesis of impossibility of the installments, since it is possible to assume that the temporary impossibility can still be overcome, and it is only possible to assume the opportunity of a temporary suspension of the installment. In the words of Menezes Cordeiro, "the temporary impossibility has, naturally, nothing to do with the subsistence of the obligation: it is only relevant for purposes of delay".¹⁴

Therefore, for being transitory, such impossibility does not have the power to extinguish the bond, but at most to alter it for its adequacy in order to allow the satisfaction of the creditor's interests. In the opposite sense, only the definitive impossibility can be considered within the legal system of the supervening impossibility of installments. In this modality in question, the assumption that the creditor's interest in receiving the installment persists - attaining the purpose of the installment - is essential for the obligation bond not to be considered extinguished. In other words, even if temporary, the impossibility of the installment may result in the extinction of the obligation if it does not provide the creditor's interest in timely compliance.

If the creditor continues to have an interest in receiving the installment that was temporarily impossible, the legal hypothesis that would guarantee its maintenance for later compliance must be verified. In specific rules, there is a doctrine that defends the suspension of the obligation as long as the supervening circumstance that made it temporarily impossible subsists - a legal example of which can be found in the analysis of articles 625, item I, for construction contracts, 741 and 753 in transportation and

24, paragraph 2 of the Lease Law (MARTINS-COSTA, 2020, p. 162).

5 FRUSTRATION AT THE END OF THE CONTRACT

A parenthesis is opened for the differentiation of the impossibility of the provision and the frustration of the end of the contract, whose identity of effects does not mean synonymy of terms and has special relevance for the understanding of the usefulness of the provision to the creditor in the face of a supervening fact that places an obstacle to the provision due.

The frustration of the end of the contract is explained by the doctrine as a hypothesis in which the provision is fully possible, but which, due to a supervening situation, loses its meaning or function in such a way that its conclusion is no longer justifiable.

The English origin institute was then absorbed by other European countries, especially by German law, based on Windscheid's theory - which aimed to "solve the legal problems arising from the supervening of circumstances other than those at the time of contracting, especially after World War I, when Germany experienced unspeakable inflationary moments, causing a total turnaround in contract law" (NANNI, 2016).

According to this theory, the objective basis disappears when there is destruction of the relationship of equivalence or frustration of the purpose of the contract. In the teachings of Arnaldo Medeiros da Fonseca (1943) on the theory of the basis of the business:

The basis of the transaction is understood to be the representations made by the parties at the time of the conclusion of the contract about the existence of certain basic circumstances for their decision, in the event that these representations are regarded by both parties as the basis of the contractual agreement (Geschäftsgrundlage), thus including, in principle, among them, e.g., the equivalence in value between the service and the consideration, considered tacitly intended; the approximate permanence of the agreed price, etc. When, as a result of events occurring after the contract was concluded, the basis of the business disappears, disturbing the initial balance, the contract would no longer correspond to the will of the parties and the judge should, through his intervention, readapt it to this will, either by terminating it or modifying it, so that it corresponds to what the parties would have wanted if they had foreseen the events¹⁵.

The frustration of the end of the contract occurs when the practical result of the provision is verified to be unfeasible, the effect of which is the removal of the debtor's liability for late payment, imperfect performance, contractual imbalance and default, even in the face of the fact that the provision is still possible, but such "release" only becomes justifiable "*if there is a change in the factual support of the contract that generates a disconnection between the formal provision itself and the practical and objective interest of the contracting parties*" (NANNI, 2016), the basis of the legal business ceasing to subsist.

The theory of frustration of the end of the obligation to perform was incorporated by Brazilian doctrine, due to the lack of legal provision in the system of the Civil Code of 1916, which did not deal with the figure of contractual revision, nor with the excessive onerosity, relying on the BGB to justify the understanding that it would be impossible to provide a service "*whose fulfillment requires extraordinary and unjustifiable effort on the part of the debtor*"¹⁶. The first decisions on contractual resolubility and

revisability - as figures of their own, divorced from the institute of supervening impossibility not attributable to the obligor - came from Nelson Hungria, when he was still a first degree judge in the 1930s (MARTINS-COSTA, 2020, P.195). Also dates from the 1930s the use of the theory as grounds for solving legal conflicts arising from the global crisis, a time when the theme began to be recurrently (and unduly) mixed with the theory of unforeseeability and fortuitous cases in order to create some confusion between the institutes.

The theory was so well received that it was included in Enunciation No. 166, in the III Conference on Civil Law, held by the Judiciary Studies Center of the Federal Justice Council:

The frustration of the end of the contract, as a hypothesis that cannot be confused with the impossibility of providing the service or with excessive onerosity, is supported in Brazilian Law by the application of article 421 of the Civil Code.

It is important to emphasize the requirements for the frustration of the end of the contract to remove the effects of arrears or default from the debtor *(a) that the contract be bilateral or unilateral, of patrimonial nature, commutative or aleatory, of deferred or continuous performance; (b) that the purpose of the contract be part of its content; (c) the contract loses its meaning, its raison d'être, due to the impossibility of reaching its end; (d) an event occurs subsequent to the contracting that was not within the contract's control and was unrelated to the faulty performance of the parties; (e) the frustrated contracting party is not in default* (NANNI, 2016).

From the frustration of the end of the contract, two consequences may be verified: its termination or its readjustment, adjusting some obligations in order to preserve the contractual bond - contracts that have their synallagm radically affected due to the profound changes that have taken place between the moment they were signed and the moment they were concluded, greatly altering the basis of the business, require its termination if impossible or its modification if possible.

As pointed out by Professor Nanni, *"As a consequence of the frustration of the end of the contract, the doctrine does not disagree in pointing out that, if the contract has not begun to be performed, there is the resolution with return to the previous state, being the parties released from the installments; if it has started its execution, the fulfilled installments remain firm, not being performed those falling due"* (NANNI, 2016). Thus, in addition to the verification of the possibility of maintaining the bond between the parties with the survival of the obligation, one should consider the contractual stage in which they are at the time of occurrence of the supervening event that changed the contractual basis.

With the advent of the 2002 Civil Code, the contractual basis theory (or frustration of the end of the contract) was "solved"¹⁷ by the legal provisions that allow contractual revision due to excessive onerosity, as well as by the institutes of termination in case of supervening impossibility of providing the service, there being significant doctrinal aversion to the resumption of a theory idealized to deal with the lack of specific legal provision.

6 EXCESSIVE ONEROSITY

Once the doctrinaire reflection is over, the Civil Code of 2002 brings mechanisms that aim at the preservation of legal businesses affected by supervening circumstances that hinder the fulfillment of the obligations, highlighting what is preconized in article 317.

The rule that provides for the possibility of revision of the installment brought in the aforementioned article, which "*has as limits, the fact that (i) it is limited to pecuniary obligations, as indicated by its topography in the Civil Code, and (ii) governs the imbalance that affects the same installment considered in two temporally distinct moments, namely: the moment of its covenanting and that of its execution; and having as a requirement the existence of unpredictable reasons that cause manifest disproportion between the value of the due installment and that of the moment of its execution*" (MARTINS-COSTA, 2020, p.212).

In these terms, the reach of article 317 seems to suffer a relevant limitation¹⁸, which justifies the continued articulation of the contractual basis theory (or frustration of the end of the contract) to supplant its reach to non-pecuniary obligations. Note that, in the strictness of the civil law, excessive onerosity may result in the review of pecuniary obligations (317); or in the review or termination in contracts of continued performance (articles 478-480 - whose terms derive from the theory of supervening excessive onerosity

- which align with devices addressed to contractual review of commutative contracts, such as in cases of lease, contracting and insurance). *In verbis*:

Article 478. In contracts of continued or deferred performance, if the performance of one of the parties becomes excessively burdensome, with extreme advantage for the other party, due to extraordinary and unforeseeable events, the **debtor** may **request the termination of the contract**. The effects of the sentence that decrees it will be retroactive to the date of the summons.

Art. 479. The resolution may be avoided by the defendant offering to **modify the** conditions of the contract **equitably**.

Art. 480. If in the contract the obligations are incumbent upon only one of the parties, he may plead that **his provision be reduced**, or the manner of performance be altered, in order to avoid excessive onerosity. (Emphasis added).

Art. 478 of the Brazilian Code provides for the rescission, at the debtor's request, in case of supervening onerosity, having as requirements: the existence of a synallagmatic contract, with installments deferred in time, one of them being burdened by supervening onerosity at the time of the contractual conclusion, arising from extraordinary and unpredictable factors, causing the other party "extreme advantage". Once these requirements are met and proven, the debtor's legal sphere is entitled to the formative right of termination (rescission, in the case of long-lasting contracts) of the legal contractual relationship arising out of the contract (MARTINS-COSTA, 2020, p. 214).

Thus, art. 478 establishes, therefore, an option for the debtor who may request the contract's termination, provided that some requirements are met. The contract will only be reviewed, pursuant to art. 479, if the creditor offers the adjustment. It seems, therefore, that the Civil Code failed to prioritize the preservation of the contract by establishing as an immediate consequence the contractual rescission in the

face of supervening difficulties that generate an imbalance between the obligations assumed by the parties. However, after doctrinaire construction in the sense that *"the rules on the contract termination due to excessive onerosity did not follow the spirit of the new Civil Code (LGL\2002/400), since to terminate the contract making both parties lose, directly affronts the principle of the preservation of legal business (article 170 of the CC), which is founded on the social function of the contract"*¹⁹.

With such construction, Enunciation 176, of the III Journey of Civil Law of the Center of Judiciary Studies of the Federal Justice Council, states that: *"In attention to the principle of conservation of legal business, art. 478 of the Civil Code of 2002 should lead, whenever possible, to the judicial review of contracts and not to contractual resolution."*

The issue that matters for the present study is to differentiate the institute of the supervening impossibility of the provision of services from the consequences of the excessive onerosity established in our civil system: while the excessive onerosity occurred by unpredictable phenomenon in a way that causes contractual imbalance between the parties may have as effect not only the contractual termination, but also the readjustment of the provision (of what is assumed to be still possible); the supervening impossibility is an institute that directs exclusively to the extinction of the obligation in the face of its complete impossibility of provision by the debtor, which is released due to the lack of imputability for the occurrence of the supervening event.

Thus, the supervening impossibility of the provision may determine the extinction of the duty to provide, provided that the impossibility is absolute and definitive - excepting only the case of temporary impossibility that by subordination to the creditor's interest, the consequence of the supervening impossibility of the provision is only the contractual termination. On the other hand, the supervening event that changes the contractual balance in an unpredictable manner influences the contracts of successive tracts so as to readjust it, with termination being its consequence only by exception.

As Gustavo Tepedino brilliantly synthesizes the explanation differentiating the institutes of supervening impossibility and excessive onerosity:

Unlike the institute of excessive onerosity, which deals with hypotheses of subjective impossibility of performance that affect the commutativity of the contract, in the case of fortuitous event or force majeure the impossibility is objective, preventing compliance *tout court*, since the provision becomes impossible.²⁰

In other words, while the hypotheses of fortuitous or force majeure cause objective impossibility in the fulfillment of the provision, the excessive onerosity, on the other hand, generates subjective impossibility, characterized by the extreme difficulty in the fulfillment associated with significant contractual imbalance, caused by supervening, extraordinary and unpredictable facts.

7 SUPERVENING IMPOSSIBILITY IN THE BRAZILIAN CIVIL CODE

As already said, when studying the supervening impossibility of the provision, there is no sense the differentiation of the expressions "fortuitous case" and "force majeure", especially because they appear together in the legal text and provide the same effect for the purposes of exclusion of liability of the debtor. Thus, when the impossibility arises from a third party fact or natural force (act of God or force majeure) or legal force, the search for the possible consequences for the solution of the impasse begins, seeking the verification of the effects authorized by law: (i) the termination of the contract, its undoing, its extinction, with effects *ex nunc*, i.e., from the moment in which the termination was declared forward; (ii) "irresponsibility" of the debtor for the losses caused to the creditor.

In the Brazilian Civil Code, the supervening impossibility was regulated in a fragmented manner, since it is possible to verify its occurrence in general hypotheses, "*disciplined when dealing with the modalities of obligations and the species of contractual obligations, as well as the specific cause of impossibility, namely, the removal of liability (and consequent duty to indemnify) by unforeseeable circumstances or force majeure*"²¹.

Thus, we have the *general* regulation brought in articles 234-235, 238-240, 245- 246, 248, 250, 254-256, 279, whose lack of imputability of the debtor for the occurrence of the obstacle in its provision is defined as a situation that releases it specifically considering the types of obligation assumed - that is why the supervening impossibility of the provision is foreseen as a consequence individually considering the different types of obligations in the Civil Code.

It is verified as a general basis, in the obligations to give and return something certain, the impossibility of the debtor occurs by the perishing of the thing, which is released from its obligation if such deterioration has not occurred by circumstance not attributable to the debtor. However, the contractual rescission is excepted in alternative obligations, being possible to the creditor the option of accepting the thing owed with a reduction in the price, according to his interest.

As for the obligations to do and not to do, which have as their core the provision of an activity, the supervening impossibility to comply with the agreed upon provision may or may not result in the release of the debtor, depending on the personal nature of the obligation: observed the personal nature, in the event of supervening impossibility, it is evident that the extinctive effect of the legal transaction is imposed, as it is an absolute impossibility. In the opposite sense, if it is possible for someone else to perform the installment, but not the debtor, the supervening impossibility is not verified in an absolute manner, because it is still possible for someone else to perform the installment, which is not the case of the debtor's release from its obligation.

In addition to the specific provisions applicable to the types of obligation, the supervening impossibility in the provision is foreseen in specific causes arising from unforeseeable circumstances or force majeure, as seen in articles, 393, 399, 535, 607, 625, item I. It is verified, therefore, that the fortuitous case or force majeure is also related to the involuntary non-performance of the provision, extinguishing

the obligation by the absolute impossibility of its fulfillment, in view of a supervening fact.

Act of God and force majeure appear as supervening causes that give rise to suspension of the obligation or impossibility, in addition to motivating the debtor's exemption from liability for losses and damages resulting from non-performance of the obligation.

8 PANDEMIC AND THE DISRUPTION OF COMPLIANCE

According to statistics reported by the Brazilian Association of Jurisprudence, by the beginning of April 2020 (approximately one month after the decree of measures to control the pandemic in the State of São Paulo), by consulting the first degree judgments of the Court of Justice of the State of São Paulo, 811 decisions mentioning the terms researched had been identified, referring to 530 different cases. According to the research, "*the first mention of Covid-19 in the bank of judgments occurred on March 13, 2020, one week before the declaration of public calamity by the state government. The exponential behavior identified in the amount of confirmed cases of Covid-19 in the state of São Paulo is not observed, but there is certainly a tendency for an increase in the volume of decisions mentioning the terms*"²². Thus, in addition to the threat to individual health, the pandemic caused by Covid-19 had an undeniable impact on several contractual relationships previously assumed.

In light of this, much has been discussed about the institutes of law that would guarantee the flexibility of *pacta sunt servanda* to deal with unpredictable phenomena such as this one, invoking the most varied of these that include the fortuitous case, force majeure, rebus sic stantibus, unforeseeability, excessive onerosity, breach of the objective basis, *pacta sunt servanda*, imbalance, exception of unfulfilled contract and objective good faith are just some of the figures invoked.

In a study on the subject, André Abelha, who holds a Master's degree in Civil Law from the State University of Rio de Janeiro (UERJ), presented an interesting article with the aim of reflecting on the four most common impacts of the pandemic on contractual relations, summarizing: "*(i) the permanent impossibility of fulfilling the obligation or, with a similar effect, frustration of the end of the contract; (ii) the momentary impossibility of fulfilling the obligation when it is due; (iii) the supervening imbalance of the obligation; and (iv) the deterioration of the debtor's financial situation*"²³.

Firstly, under the perspective of the definitive impossibility, the author points out that the pandemic would not be *a priori* and generically a fortuitous or force majeure case in itself, each party must prove its impact on the contractual reality individually considered, triggering a necessary and irresistible fact, whose effects could not be avoided or prevented (art. 393, sole paragraph of the CC), and that generated the impossibility of the fulfillment of the provision (arts. 234, 248, 250 or 607 of the CC), or the frustration of the objective of the contract (CC, art. 421), whose consequence would be the termination of the contract. The caput of art. 393 of the Civil Code, however, does not bring a rule of termination, but rather of exclusion of liability, breaking the causal connection and exempting only the debtor from indemnifying the creditor for losses resulting from unforeseeable circumstances or force majeure (ABELHA, 2020).

In dealing with temporary impossibility of the obligation, Abelha concludes that if the pandemic is found to generate fortuity for the fulfillment of the contractual term, there will be no delay by virtue of the provisions of article 396 of the Civil Code – which may result in two hypotheses: "(a) *due to facts arising from Covid-19, the purpose of the contract may be frustrated even before maturity (Impact no. 1), and the party may plead for termination without fault; or (b) even after maturity, the creditor is obliged to receive the installment (delivery of the opinion) fulfilled by the debtor after the deadline (no delay!), provided that the end of the contract is preserved (possibility of use in arbitration)*"²⁴ .

Thirdly, if a supervening imbalance in the contractual performance is verified, the author indicates that the situation should include an evaluation of the possibility of reestablishing the original contractual synagma: if so - except for contracts governed by the Consumer Protection Code - the debtor, even if he/she meets the requirements of art.478 of the CC, he would be entitled to a revision of the contract by virtue of an extensive interpretation of article 317, which, together with article 478, can be applied not only to merely financial matters (such as monetary correction), but also to the obligations to give and to do in order to promote the rebalancing of any provision (ABELHA, 2020).

9 CONCLUSION

Much has been discussed about the institutes of law that would guarantee the flexibility of *pacta sunt servanda* to face the unpredictable phenomenon of the pandemic by COVID-19, invoking the most varied of these that encompass the fortuitous case, force majeure, *rebus sic stantibus*, *unforeseeability*, excessive onerosity, breach of the objective basis, *pacta sunt servanda*, imbalance, exception of unfulfilled contract and objective good faith. The theme has been addressed in court under the most diverse themes of civil relations, noting a considerable volume of lawsuits seeking the modification of pacts formalized before the pandemic.

In this context, the differentiation between the institutes of frustration of the end of the contract, supervening impossibility of performance and excessive onerosity - which were already frequently debated under the same perspective of disturbances in the performance of the obligation - began to have even more doctrinal and jurisprudential fusion in order to justify the most varied consequences to contractual relations affected by the supervenience of a global pandemic.

Despite the clear differentiation between these types of breaches of obligation and their effects, many authors who have approached the subject to justify the easing of obligations in times of pandemic have used a doctrinal mixture to justify the application of one or another legal solution to the cases.

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CHAPTER 46

Chrissie's Death: orchestral performance and filmic narrative

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ABSTRACT

The purpose of this article is to conduct a discussion between orchestral music and its participation in film narrative. In order to understand how the orchestral performance contributes to the construction of the narrative of a film, we made a cut of the scene *Chrissie's Death*, the opening scene of the film *Jaws*, by Steven Spielberg. *Chrissie's Death* was selected as the object of analysis because it is the scene in

which the first shark attack occurs and, consequently, the first orchestral performance in the film *Jaws*. For the reading of the scene, carried out by means of analysis, we used as theoretical support the concept of Performance Intensity by Richard Schechner (2011), paired with the Functions of Music in audiovisual narrative, listed by Jiménez (1993). As a result, taking into account the Functions of Music in Audiovisual Narrative, it was possible to understand that the way the orchestra performs can assist in the construction of the narrative unity of the *Chrissie's Death* scene.

Keywords: Film, Music, Orchestra, Filmic Narrative, Performance.

1 INTRODUCTION

Music in cinema was born with cinema itself, since the invention of the cinematograph by the Lumière Brothers in Paris in 1895, it is known that the first projections of film shows were accompanied by music. According to Wierzbick (2009), the films presented by the Lumière in December 1895 were accompanied by pianist Emile Maraval.

He mentions that he also had a harmonium player at the Lumière film performances in London at the Polytechnic Institute on February 20, 1896, and that orchestras were involved in the performances that took place at the Alhambra and Empire theaters, also in London, in April 1896. Within this, the author reports that an orchestra was also playing when the Lumière performed in New York at Keith's Vaudeville House on June 28, 1896.

As can be seen, orchestras have accompanied the cinema since its inception, as well as the composer and works exclusively for films. This is because in 1908 we have the first musical production for a film commissioned to a composer; in this case, the Frenchman Camille Saint-Saens (1835-1921), and his composition for the film *L'assassinat Du duc de Guise*. Passing by Joseph Carl Breil and his work for the film *The Birth of a Nation*, of 1915, we will find in the 1930s, already in the era of sound cinema, some European composers settled in Hollywood, whose music for films will remain as a foundation until the 1950s.

The work of these composers was, above all, in symphonic style and with great influence from Romanticism. In this style, starting with the music for the film *King Kong* (1933), Hollywood began to

develop its own language of orchestral composition for films. This contributed to the consolidation of orchestral music in Hollywood cinema; and, at the same time, inaugurated what became known as the "Golden Age" of Hollywood film music, which will last until the 1950s.

For movies, John Williams' orchestral composition style is reminiscent of the "Golden Age"i , since it is in some way influenced by composers of this period. However, in this composer, there is also a great sense of originality and spirit of creative elaboration. Thus, in the cinematographic scenario of the 1970's it is precisely John Williams who will compose, in 1975, the music for Steven Spielberg's film *Jaws*, from which we extracted the scene *Chrissie's Death* to serve as the object of analysis for this article.

According to Peter Benchley's (1974, p.5) account in the book *Jaws*, the attack on Chrissie Watkins occurs while she was visiting Amity Island, a fictional island located off the coast of New England, during the 1974 summer vacation. The incident occurred on a beach south of the island, with Chrissie being victimized during the night while swimming. As Benchley describes it, the shark grabs her right leg and drags her from side to side until it pulls her under the water for good. Chrissie Watkins was the first victim of the great white shark prowling the waters of Amity Island and her remains, found the next day, include an arm, a hand, and half of her chest.

The music that accompanies the narrative of this scene is part of the original composition that John Williams produced for the film *Jaws*. To analyze the musical excerpt from *Chrissie's Death* we will rely on the functions of music in audiovisual narrative, listed by Jiménez (1993), in order to observe how the orchestral music influences the narrative of the scene. In order to observe the performance of the orchestra, performing John Williams' music, we will rely on the concept of performance intensity, by Richard Schechner (2011). Thus, considering the functions of music in audiovisual narrative and the intensity of the orchestral performance, this paper aims to understand how the participation of orchestral music in the construction of the narrative unit of the scene *Chrissie's Death*, from the movie *Jaws*.

2 THEORETICAL FOUNDATION

To talk about the functions of music in audiovisual narrative we seek support from Jesús García Jiménez (1993), in his work *Narrativa audiovisual*. Jiménez (p. 269), from a dramatic conception, classifies ten functions of music regarding its insertion in the audiovisual context. 1) Referential function: when the music refers to a specific place, for example, a saraband refers to Spain. 2) Focusing function: when it concerns the perceptual point of view, that is, position, opening angle and depth of field. 3) Pragmatic function: halfway between the referential function and the focusing function, music refers first to the time and conditions of production. 4) Formative function: when the music creates an atmosphere to express not the way the characters perceive the space, but the way the spectator perceives the characters in that space. 5) Expressive emotive function: when music holds the spectator's attention and impels him/her to live and share with emotion the characters' actions. 6) Environmental function: when the music leads to the dramatic and aesthetic perception of the space, contributing to the decoration and setting the mood of a situation. 7)

Magical function: music creates a kind of mandala or limited space where other exceptional forces operate. 8) Delimiter Function: when music marks structural parts of the narrative. 9) Identifying function: music identifies geographical spaces in different parts of the world, examples are folk songs. 10) Lubricating function: the music functions as a lubricant for the fractures originated in the game of the scale of planes, restoring the continuity of the narrative discourse.

Concerning Performance Intensity, this concept was formulated by Richard Schechner (2011) in *Points of Contact* between anthropological and theatrical thought. Although the points of contact listed by Schechner are between the anthropological and the theatrical realm, one can deduce that this dialogue also extends into the realm of the performing arts in general, including music and film. Thus, in understanding Performance Intensity, Schechner mentions that a great performance modulates in intervals of sound and silence, there being an increasing and decreasing density of temporal, special, emotional, and synesthetic events. According to the author, although perceived as simple, these elements are aligned in a seemingly inevitable and complicated pattern. As for the patterns of intensities, these can lead to an ecstatic trance for both performers and spectators.

Still on the intensity conception of performance Schechner reveals that there are low intensity patterns and high intensity patterns. Low intensity is trophotropic: the heartbeat slows down, as does the blood pressure; the pupils are constricted, the EEG is synchronized. There is a tendency toward trance and drowsiness. High intensity is ergotropic: the heartbeat increases, as does the blood pressure; the pupils dilate, the EEG is desynchronized, and there is a high level of arousal and wakefulness. With great acuity and a strong sense of perception, Richard Schechner concludes that to understand performance intensity is to discover how a performance constructs monotony or how it attracts participants (2011, p.219).

3 METHODOLOGY

Given the nature of the phenomenon to be studied in this research, the qualitative research approach was adopted, since this type of approach works with the universe of meanings, motives, aspirations, beliefs, values, and attitudes. With a view to generating new knowledge in the field of film music, useful for the advancement of further investigations, the nature of the research fits as basic in nature. As for the objective, it is an exploratory research since the intention in this article was to obtain more familiarity about the relationships involving orchestral music and Hollywood cinema. Regarding the procedure, the article made use of bibliographical research, surveying theoretical references already analyzed and published in written and electronic media such as books, scientific articles, dissertations, theses, and Web pages. It was also performed an analysis of the music used in the scene *Chrissie's Death*, from the movie *Jaws*, in order to observe how the performance of the orchestra and its compositional apparatus could contribute to the construction of the narrative unit of the scene.

4 DISCUSSION

In the sense of causing some kind of sensation in the viewer, the music written for *Jaws* was as unique as the images Steven Spielberg envisioned. Its intensity, and the visceral power contained within it, helped make the film a global phenomenon to the extent that Spielberg compared it to Bernard Herrmann's equally frightening music for Alfred Hitchcock's *Psycho*, produced in 1960.

In *The Jaws Log*, Carl Gottlieb (2010, p. 200) relates that in the discussions between John Williams and Steven Spielberg about the music for *Jaws*, they both listened every day in Spielberg's office to music from past films. In addition, they also listened to recordings by Stravinsky and Vaughan Williams looking for analogies between the work of these composers and what they thought the themes for *Jaws* should be.

Bearing in mind what has been said above regarding John Williams' observations about the music of erudite composers of the past; some authors, taking the idea of pastiche as a point of observation, claim that *Jaws*' music reverberates excerpts from composers such as Maurice Ravel, in *La valse*; Antonin Dvořák's, in *Symphony of the New World*, and in Igor Stravinsky's "*The Rite of Spring*."

In spite of the above considerations, because of its effectiveness in the dramatic action, many authors, on the other hand, claim that the music in *Jaws* has become one of the most recognizable in the history of film music. Aligned with the camera shots from the shark's perspective, it is by itself sufficient to evoke the shark's attacks, even when the spectator does not see it on the screen, as can be observed in the scene of the first victim, the girl Chrissie.

Williams' idea proves to have great compositional and performative potential in the context of the drama-suspense film. The leitmotif, the recurring musical motif that typifies the shark, is an ostinato built on the Mi-Fá notes that John Williams, in support of dramatic needs, skillfully delays or accelerates during the development of the film's narrative. The semitone interval, used to construct the shark leitmotif, carries with it a sense of built-in tension, so that its constant repetition, in the audience and filmed action relationship, establishes immediate emotional associations with terror (KARLIN & WRIGH, 2004, p.176).

In the sense described by Karlin & Wrigh, we believe that the natural tension caused by the Mi-Fá notes gains a more dramatic contour when orchestrated in the bass region, as John Williams indicated to his orchestrator, Herb Spencer. The picture below shows this orchestration in the low register of the orchestra using harp, cellos, double basses, bassoons, contrabassoon and piano, used along with the percussion section.

Figure 1: first 5 bars of the main theme from Jaws.

Jaws M-101 *Jaws* Titles John Williams
Orchestrated by Herb Spencer

The musical score shows the following instrumentation and dynamics for the first five bars:

- Bar 1:** Harp (pp), 6 Vc. (p), 2 Bsns./2 Vc. + 6 Cb.+Cntrabsn. (8va bassa) (p).
- Bar 2:** 6 Vc., 2 Vc. + 2 Bsns. div., Cntrabsn./4 Cb., 2 Cb.
- Bar 3:** 6 Vc., 2 Vc. + 2 Bsns. div., Cntrabsn./4 Cb., 2 Cb.
- Bar 4:** Vc./Cb. (8va bassa) (divided as before), 2 Vc. + 2 Bsns. div., Cntrabsn./4 Cb., 2 Cb.
- Bar 5:** Vc./Cb. (8va bassa) (divided as before), 2 Vc. + 2 Bsns. div., Cntrabsn./4 Cb., 2 Cb.

Source: KARLIN, Fred; WRIGH, Rayburn. *On the Track: a guide to contemporary film scoring*. p.177.

Since the shark is invisible to the audience, only appearing at the end of the film, the leitmotif above represents his impending attacks, leading the viewer to associate the musical theme with the shark. That is, the shark leitmotif, which is exploited toward a climax of tension, is the shark itself that the viewer does not see, but knows that it attacks and devours its victims. Furthermore, the instrumentation and orchestration noted above represent the relentless force of the shark, evoking, as John Williams himself said, a sense of oppression in the viewer (FRIEDMAN, 2008, p.174).

However, the music in *Jaws*, written to support and reinforce the expressive demands of the narration, will only be effective and precise in fulfilling the functions of stage music through the orchestral performance. If the music was conceived and written for an orchestra, then the orchestra will be in charge of echoing the sonority idealized by the composer. In fact, among contemporary film composers, John Williams is probably the most traditional when it comes to the use of orchestral power in film music (DARBY & BOIS, 1990, p.521).

The orchestra projects the timbre built in the composer's mind to the ear of the spectator who, by hearing his "voice", also narrating the events on the screen in front of him, will be able to identify and have a better understanding of the story being told. It is in this sense that, taking into account the functions of music in audiovisual narrative, from now on we will analyze the orchestra's performance in the scene *Chrissie's Death*, from Steven Spielberg's film *Jaws*.

The scene opens with a group of young people on the beach, presumably at an outdoor party on Amity Island. In this environment, after an exchange of glances and a brief dialogue between Chrissie Watkins (Susan Backlinie) and Tom (Tom Cassidy), an inebriated young man, Chrissie starts a run towards the sea. In the water, she suddenly feels something pulling her right leg. Subsequently, Chrissie is dragged from side to side before being pulled permanently to the bottom of the sea and never seen again. In this opening scene of the film *Jaws* Steven Spielberg decided beforehand not to show the shark to the audience,

letting them imagine what was happening under the water, so that they would think that something was attacking Chrissie. In this sense, the music appears descriptively, revealing the invisible shark through its theme, written for cellos, double basses, bassoons and contrabassoon.

Seen from the bottom of the sea, from the shark's perspective, Chrissie appears on the screen floating peacefully in the water. At this point, we hear the first intervention of the orchestra, which, while performing, echoes the sound of a harp, sustained by a pedal provided by cellos and double basses. According to Litwin (2012), the harp is the instrument that, in films, evokes aquatic sounds. In this framing of the scene, it merges with the sound of the celesta, an instrument that, as Adler (1989) states, when it bends the strings of the harp provides a silvery sound.

From the point where Chrissie appears in the image below, until the next shot, when she appears swimming near a buoy, the sound ambience generated by the harp, celesta, cellos, bass and violins, these subtly as background, creates an atmosphere of expectation, seeming to announce to the spectator the imminent danger. What in fact occurs in the next shot. Here, the music acts within the formant function, described by Jiménez, creating an atmosphere to express not the way Chrissie perceives the space, but the way the spectator perceives her in that space, revealing the action before the iconic speech does.

Figure 2: Chrissie's view of the shark's perspective. Formant function.



Source: <https://www.youtube.com/watch?v=dg-HIHMhthY>

Following this, we can observe the sound prolongation performed by the harp and celesta that begins with Chrissie's smile, shaking her hair. Here the music can be perceived performing a lubricating function, providing rhythmic continuity in the transition to the next shot, when it again returns to the forming function, revealing that the shark is approaching the victim's legs. This revelation is made through musical elements extracted from the shark's leitmotif, played by cellos and double basses and accentuated by the bass drum.

Figure 3: Chrissie smiling. Lubricating function



Source: <https://www.youtube.com/watch?v=dg-HlHMhthY>

Figure 4: the shark approaches Chrissie's legs. Formant Function



Source: <https://www.youtube.com/watch?v=dg-HlHMhthY>

In the next shot, Chrissie is abruptly pulled down! This pull is synchronized with a chord from the brass section, the imposing sound of the orchestra, which appears to announce the overwhelming force of the shark. This chord is prolonged by a cluster in the violins; which, like a resonance of "Trembling for the Victims of Hiroshima," a piece that Krzysztof Penderecki composed to describe the agony of the victims of the atomic bomb, announces the beginning of Chrissie's agony. In the sequence, Chrissie is carried back and forth by the shark while the horns in glissandi, backed by the trombones, tuba and bombo play heavily, typifying the force of the sea beast.

At the same time, a strong dissonance sounds in the strings section, played in an agitated manner, tinting Chrissie's agonizing wavering.

Meanwhile, the xylophone, an instrument used by Camille Saint-Saëns to represent a skeleton, in "Dance of the Maccabre," is played with such fury that the piercing sound it echoes seems to represent the fangs of the shark penetrating the victim's flesh. Here, the music seems to fulfill rhythmic and delimiting functions, since, enhancing the movement of the visual rhythm, it marks structural parts of the narrative while illustrating the jolt suffered by Chrissie and describing her movements from side to side.

Figure 5: Chrissie being pulled down and dragged by the shark. Rhythmic and delimiting functions



Source: <https://www.youtube.com/watch?v=dg-HIHMhthY>

A moment of relief! Almost free of the beast's attacks, the victim clings to the buoy; however, a descending and sinister melodic passage, played by the clarone and harp, in the bass register, already announces his death! Again the creature attacks! This time the horn, stretching the sinister melody of the clarone, and tinged by the dissonance of the trumpet and violins, seems to say that the victim will not resist one more offensive of the shark. Indeed! Chrissie is definitely taken to the bottom of the ocean. She disappears and the orchestra with her, leaving only the clanging of the buoy's bell and the sound of the water.

Here, given the situation experienced by the victim and the sonic ambiance provided by the orchestra, we do not find in Jimenez a specific function for music. However, we take the liberty of marking the music in this shot as a dramatic function, since it intensifies the dramaticity of the scene by projecting Chrissie's impending death. In addition, the way the instruments are performed in this shot contributes in reinforcing the dramatic density of the victim's final moments.

Figure 6: Chrissie is led to her death. Dramatic Function



Source: <https://www.youtube.com/watch?v=dg-HIHMhthY>

5 CONCLUDING REMARKS

Considering the functions of music in audiovisual narrative, which, as seen, through them one can better understand the participation of music in filmic narrative; we believe that the orchestra's performance was of real importance for the fulfillment of these functions. According to Richard Schechner's observation, regarding the intensity of the performance, one can say that this large organic instrument, called the orchestra, performing in the Chrissie's Death scene, produces a performance of high intensity. This is in light of the fact that at many moments there is a high level of excitement from the viewers who have seen this scene over the years. When Chrissie is pulled down and then returned to the surface we can hear her gasping for breath, her cries of terror, her despair. In this, the intensity of our emotions is heightened, since we are also experiencing Chrissie's agony as spectators. We are internally affected by the scene and the sound that emanates from it.

This emotional alteration that the scene generates in the viewer in large part is caused by the intensity of the orchestral performance, narrating Chrissie's misfortune. We see the orchestra eventually produce violent and distressing sounds in order to intensify the viewer's sensations and the dramaticity of the scene in the victim's sad plight. The functions of the music could be fulfilled through the orchestral performance, which, with its instrumentation and timbric coloration, brought consistency to the narrative of Chrissie's Death. With the orchestral performance, narrative events are illustrated and anticipated on the viewer's screen, and the idea of rhythmic continuity, through the use of ostinati and the prolongation of the sound of some instruments, between camera shots and in shot transitions, strengthens the unity of the narrative. Without Williams' music, and, consequently, without the orchestra's performance, which begins with harp arpeggios and ends with trumpet and violin dissonances, the audience would certainly have a different perception of Chrissie's Death scene.

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CHAPTER 47

Paraty the estrada real: the chemistry of cachaça aging

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ABSTRACT

Since the development of the Gold Cycle, Paraty has shown prominence in the production of cachaça, which was consumed both by the national market and by slaves in Africa and by gold in the mines, being transported by the Estrada Real. The transport was carried out in oak barrels outside the country and in national wood barrels for the local market. Over time it was observed that each type of wood incorporated different odors and flavors to the cachaça. Considering that the cachaça is produced from the fermentation of the juice, different from the Rum, which is produced from the fermentation of molasses, and that the aging in different types of wood added specific sensory and chemical characteristics, allowed to establish the Cachaça as a genuinely Brazilian product.

Keywords: Paraty, History, Chemistry, Cachaça, Aging.

1 INTRODUCTION

Cachaça is the second most consumed beverage by Brazilians, with consumption estimated at 70 million daily doses (Lima et al, 2006). This drink is very appreciated for its flavor and characteristic aroma, from the fermentation, distillation and optionally aging.

To be considered aged, the final composition of the product must be at least at least 50% of its volume aged in wooden barrels, for a minimum period of one year

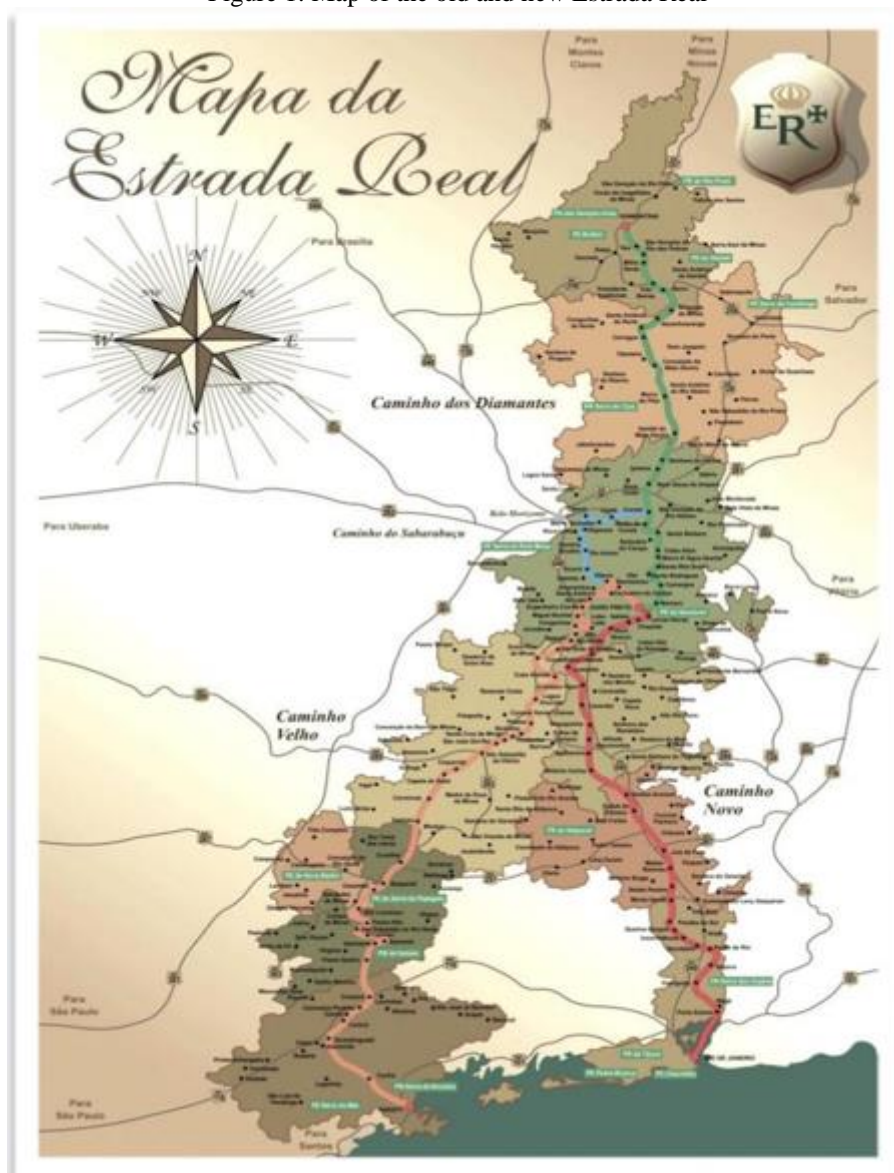
(Odello et al, 2009). The specific sensory characteristics of the drink are given by the presence of at least 1% by mass of secondary compounds such as higher alcohols, esters, carboxylic acids and carbonyl compounds that are formed during the production and aging of brandy (Nascimento et al, 1998).

Considering the importance of this product in the Brazilian historical, economic and social scenario and the possibility of its approach in the teaching of chemistry, a historical and chemistry of cachaça for the construction of a reference material for the study of the theme, as well as and for planning educational activities.

2 THE ROYAL ROAD AND THE AGING OF CACHAÇA: ASPECTS HISTORY

With the discovery of gold in the region of Minas Gerais, at the end of the 17th century, the focus of Brazilian economy abandoned the already decadent production of sugar to start the extraction of ores. To ensure that all due taxes from this mining would be paid to the Crown Portuguese, the government built and forced that all the flow of gold and slaves was done through of Estrada Real, which created an important trade route linking the region of Paraty and the mines, to the capital, in Rio de Janeiro, illustrated in Figure 1.

Figure 1: Map of the old and new Estrada Real



In addition to supplying the national market, cachaça was also an important commodity in the exchange when trading slaves with African tribes. So that the drink could be taken to Europe or Africa, it was required that the barrels used for storage and transport were made in oak. The reason for this requirement was due to the contact of the wood with the beverage, which ended up altering the sensory characteristics of the product. Since it is already used in the storage of other European spirits, oak provided the characteristics that least clashed with other traditional European drinks.

Obtaining these oak barrels and vats turned out to be an expensive and complicated task, as since the country did not have the necessary oak for the production of these barrels. Due to this question, cachaça destined for export was stored and transported in oak barrels brought from Europe, while the barrels intended for local consumption were made with wood national species that showed adequate physical characteristics, such as Ipê-amarelo, Umburana, Balm, Sassafras or Peanut.

Both the long travel times and the local storage in these barrels caused sensory changes related to the aging of the drink, which conferred characteristics color, flavor and aroma of cachaça, related to each type of wood used (Trindade, 2006; Miranda, 2008).

3 AGING: CHEMICAL ASPECTS

3.1 THE CHOICE OF WOOD

The aging of cachaça is an important parameter for improving its quality sensory, since this stage affects from the intensity of the color, which acquires tones ranging from a light yellow to tones close to brown, to the aroma and flavor, which starts to have characteristics woody, sweet, or fruity, depending on the aging time and the wood used.

In addition, the process also reduces sensory factors considered negative, such as acidity, the intense alcoholic flavor (Otello et al, 2009).

During the cachaça storage process, it is considered as an aging process.

only the situation in which the product is stored in a barrel or wooden barrel for a period of at least one year. The types of wood most chosen for the construction of barrels are balsam,

jatobá, umburana, canéla-sassafras, jequitibá, yellow ipe or peanut. At this stage, the contact

drink with the wood of the barrel will gradually provoke several chemical reactions that will change the final product.

Figure 2: The different stages of aging of cachaça



Due to the semi-permeability of wood, the aging process allows both the loss of certain components to the environment, such as water and ethanol, as the entry of oxygen, allowing the oxidation process of the aldehydes and higher alcohols generated in wort fermentation.

Among the compounds from wood that are incorporated into the beverage, there are phenolic compounds, flavonoids (figure 3) and tannins (Dewik, 2002), as well as products of partial decomposition of macromolecules, such as lignin (figure 5) and cellulose, into monomers soluble compounds, such as aldehydes and phenolic acids (Trindade, 2006; Ventura and Giraldez, 2006).

Figure 3: Luteonin, Quercetin and Rutin. Examples of flavonoids found in woods. Observing their structures, it is possible to notice that the main structure of the molecules is very similar. The addition of different radicals generates different products (Dewik, 2002).

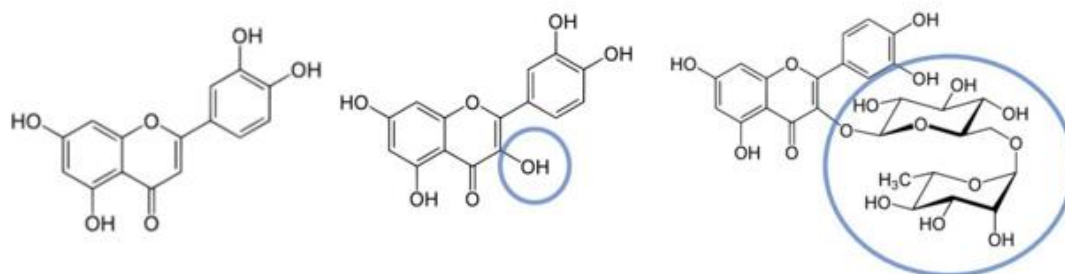
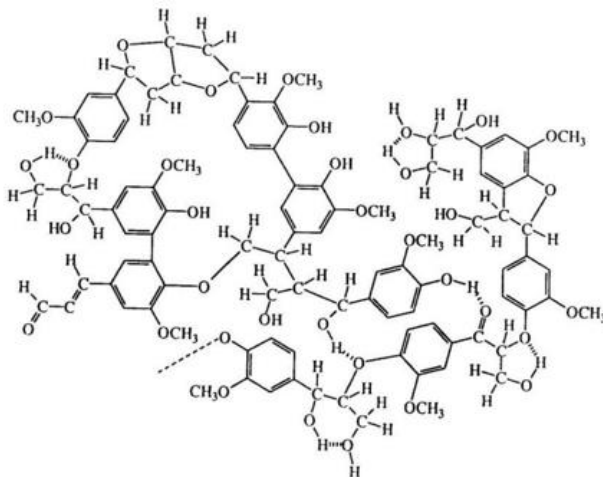


Figure 4: Example of the complexity of the chemical molecule of lignin. (Infoschool, 2012).



In order for wood to be considered suitable for the construction of barrels, it must have some features. The first one is a high density, to guarantee a good impermeability and avoid a large loss of volume of the beverage to the environment. The wood must also have good mechanical strength and durability, to reduce the risk of cracks, deformations and damage caused by the action of time or fungi and insects (Trindade, 2006).

The choice of wood will also determine which substances will be extracted for the cachaça during the aging process. Through the use of chromatographic analysis, it is possible to identify the main extracted molecules that differentiate the sensory changes caused by each woods. Figures 5 to 8 illustrate which they are. these molecules:

Figure 5: Main molecules that characterize aging in Amburana.

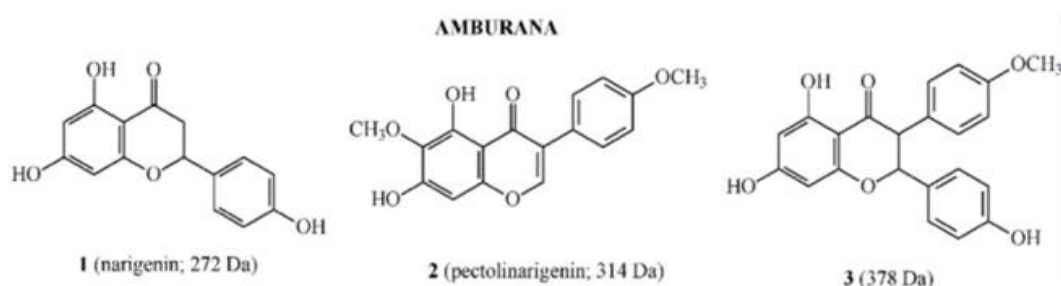


Figure 6: Main molecules that characterize aging in Jequitibá.

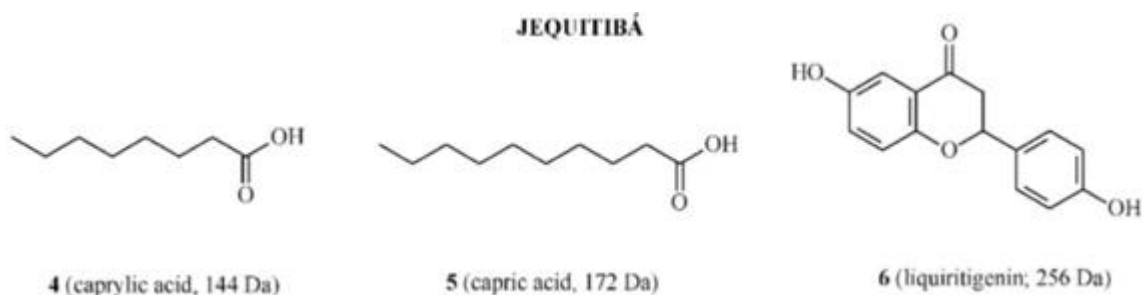


Figure 7: Main molecules that characterize aging in Balsam.

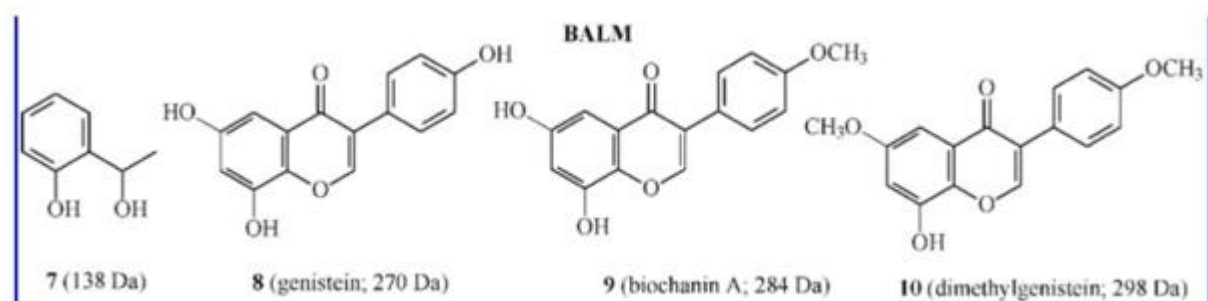
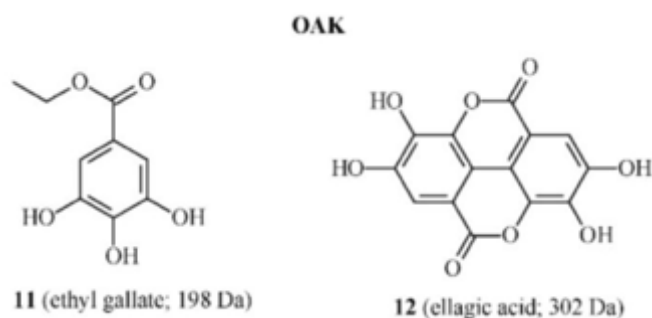


Figure 8: Main molecules that characterize aging in oak.



3.2 THE REACTIONS INVOLVED IN THE AGING PROCESS

According to studies by Miranda (2008), during the aging process, the intensification in the concentration of esters, alcohols such as n-propanol, isobutyl and isoamyl. O aging is the result of a series of reactions between the chemical components of the cachaça and those that are extracted from wood, which are also responsible for the differentiated color of aged drink.

Even though the aging process is still not completely unraveled (Miranda and Martins, 2008; Pinheiro, 2003), there is a consensus regarding the chemical steps of (Boscolo) oxidation of alcohols and aldehydes for the formation of esters, as well as the extraction, decomposition and esterification of wood lignin. At this stage, the formation of the complex ethanol-lignin, which degrade into coniferyl and synaptic alcohols, later oxidized to esters, which are the main responsible for attributing the characteristic flavors and aromas of each wood to the liquor.

In this third step, there is also the elimination of sulfur compounds, such as thiols, the dimethylsulfide and mercaptans, which are eliminated due to their high volatility.

Figures 9 and 10 illustrate the esterification process, in which aldehydes and acids carboxylic acids resulting from fermentation and distillation react to form esters and water. This process is responsible for giving the aged cachaça a smoother flavor. After the processes described, the cachaça will be ready to be bottled and sold.

Figure 9: Example of the process of oxidation of aldehydes to carboxylic acids (Acetaldehyde plus oxygen to acetic or ethanoic acid).

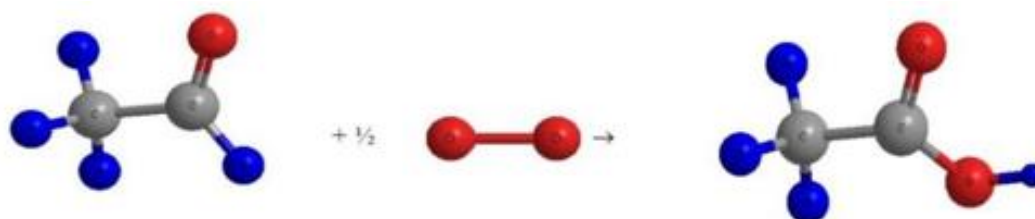
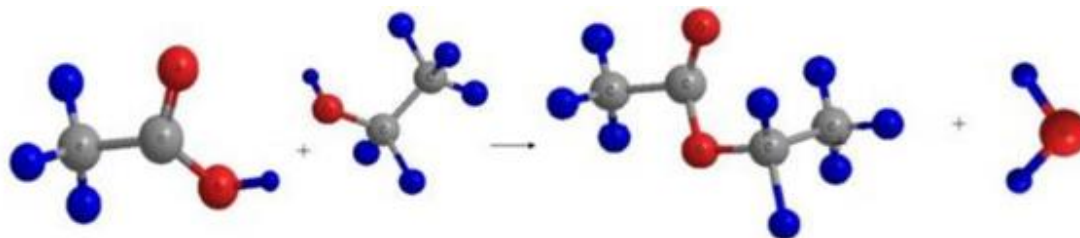


Figure 10: Example of the process of esterification of carboxylic acids to esters. (Acetic acid plus ethanol for ethyl acetate and water).



All chemical reactions and dissolution processes of wood compounds during aging of cachaça, as well as other alcoholic beverages, allow the formation of large clusters of molecules, including esters, higher alcohols and aldehydes, which are in equilibrium with the ethanol, which is noticed in the form similar to an oil that flows in back of the cup immediately after being rotated/shaken so that the liquid wets the inner walls. This formation is called “choro” or “tears of cachaça” (Figure 11).

Figure 11: Crying or tears from cachaça. Photo: Leinig Antonio Perazoli.



4 CACHAÇA IN CHEMISTRY TEACHING

There are several documents that guide curricula in Brazil, such as the Parameters National Curriculum for Secondary Education (PCNEM), National Curriculum Guidelines for High School and Educational Guidelines Complementary to National Curriculum Parameters (PCN+) (BRASIL, 1999; 2006; 2002) that make references to the contextualization and adoption of themes as strategies for approaching scientific knowledge. In Curricular Guidelines National for High School, everyday themes are pointed out as relevant:

An approach to social (everyday) themes and an experimentation that, not dissociated from theory, are not intended or mere elements of motivation or illustration, but effective possibilities of contextualizing chemical knowledge, making them socially more relevant. (BRAZIL, 2006, p.117)

Starting from everyday situations, one can seek the necessary knowledge to understand them. and, in this sense, cachaça can be a topic for the development of chemical knowledge, since that its production process involves several important concepts and processes related to distillation, fermentation, organic compounds, among others.

The work by Pinheiro et al (2003) surveys the history, production and chemical composition of cachaça, and points out some ways of deepening the theme in chemistry. Some examples cited are activities with label analysis, use of song lyrics known, presence in Brazilian cuisine, debates about its consumption, interactions between alcohol and human organism, among others.

Venquiaruto (2012) when researching in his thesis the popular knowledge of bread, wine and cachaça in a specific region of Rio Grande do Sul, addresses the production method of this drink by peasants. In addition, it relates chemical knowledge and the school context, and proposes some experimental activities for development in the discipline of chemistry that bring aspects related to cachaça, such as the formation of azinhavre.

The scientific and technological aspects are directly linked to the contributions of science in the production process, such as the separation of head, heart and tail in distillation, the technological artifacts such as equipment needed for distillation, as well as aspects related to the consumption of the product, its benefits and harms to the functioning of the human organism and behavioral changes. Therefore, we point out that this would be one of the possible approaches to the subject of cachaça at a medium or higher level in view of the knowledge chemicals, as it allows for a broader discussion, considering aspects of everyday life and problematizing important issues in society.

5 FINAL CONSIDERATIONS

Cachaça is a denomination by law, typical and exclusive of the sugar cane spirit produced in Brazil, a product established both in the historical characteristics of the production process and in chemical characteristics. This work studied the production process, transport in barrels of national woods and the aging of sugarcane brandy, exemplifying the conditions historical landmarks in the 16th to 18th centuries between Paraty and Minas Gerais, joined by the Estrada Real, which led to the production of cachaça, now recognized as a genuinely Brazilian product, representing an interdisciplinary tool for teaching sciences as different as History and Chemistry, both for higher education and secondary education.

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CHAPTER 48

Assessment of learning as a pedagogical act: constructive error

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ABSTRACT

This article deals with assessment as a pedagogical act, considering the learning and development of students. Overall, the importance of error as a didactic factor in learning is addressed. In this regard, it aims to reflect on a constructive error as a component of the pedagogical act, from the perspective of learning

assessment. As a method, it uses bibliographic research, in an approach characterized as qualitative. The study is justified to answer how error can be considered a component of the pedagogical act of learning assessment. The results show that constructive error, as a way of evaluating, is configured as one of the components of the pedagogical act of learning evaluation. It is concluded as urgent the need to understand that the errors presented in the evaluation processes can be interpreted not only as a thermometer to measure who was better or worse but as a starting point for progress. As a future contribution, there is a possibility of promoting an improvement in student learning, thus assuming a pedagogical function.

Keywords: Pedagogical Act; Learning Assessment; Constructive Error.

1 INTRODUCTION

This article emerged from the reflections experienced during the second semester of 2021 in the discipline "Evaluation and Management of Learning" and with the participation of these authors, respectively, a master's student and doctoral student of a *Stricto Sensu* graduate program in education. On this occasion, 15 meetings were held with presentations of seminars in which several interfaces related to the issues of the evaluation phenomenon were discussed. Among these, the evaluation of learning as a "pedagogical act: constructive error" was highlighted, which was considered one of the emblematic themes presented because it provoked in-depth debates with the group of students.

Hence, the proposal of this study aimed to discuss the ideas of authors who discuss the evaluation of learning as a pedagogical act and the relationship with constructive error. For this, the following question is projected: can error be considered a pedagogical component of learning evaluation? No intuito de responder a esta questão problema, se tem como objetivo principal, refletir sobre o erro construtivo como componente do ato pedagógico na perspectiva da avaliação da aprendizagem.

It is justified to carry out this investigation in the authors' intention to bring contributions to the field of evaluation, especially because of the importance of teachers conceiving the errors presented in the evaluation processes, not as a thermometer to measure the best or worst performance of students, but as an opportunity to work aiming at improving the learning of all, independent of the series in which they are

studying, because Hoffmann (1993, p. 55) points out: "A teacher who does not constantly evaluate the educational activities, in the inquiring, investigative sense of the term, installs his teaching in absolute, precast and terminal truths".

Given the above, this article presents itself in three topics that are addressed, namely (I) first-discusses evaluation as a pedagogical act, concepts of a pedagogical act, describes a brief differentiation between the evaluation of learning and evaluation for learning; (II) second – it deals with learning evaluation and constructive error to understand the pedagogical function of error, placing it as a fundamental element as a starting point for the advancement and signaling of the process of knowledge construction; (III) third- includes the analyses of the discussions held, aiming to reflect whether the error can be considered as a pedagogical component of the evaluation of learning; (IV) concludes with some conclusions regarding the theme addressed and references.

2 METHODOLOGY

Considering that this part is extremely relevant for the good progress of research, after reflecting on the theme to be studied, the authors defined the qualitative approach allied to bibliographic research for the methodological design of this article.

In this sense, considering that the qualitative approach has as one of its characteristics the work with data in text format and as Teixeira (2003, p. 127) points out "[...] the researcher seeks to reduce the distance between theory and data, between context and action, using the logic of phenomenological analysis, that is, the understanding of phenomena by their description and interpretation. The researcher's personal experiences are important elements in the analysis and understanding of the phenomena studied." In this line of thought, the researchers explored and deepened the reflections to better understand the phenomenon studied, based on the authors presented later and their experiences as educators- one with 20 years and another with 18 years.

Thus, in relation to procedures, bibliographic research has guided the best direction to be followed within the theme, a research that according to Fonseca (2002, p. 32). "[...] it is made from the survey of theoretical references already analyzed, and published by written and electronic means, such as books, scientific articles and web pages", which makes it possible to have an overview of what has already been discussed on the subject to be studied and use this information to direct new reflections. In this same line of reasoning Marconi and Lakatos (2021, p. 63) endorse stating that bibliographic research "[...] it is not merely a repetition of what has already been said or written on a certain subject, but it provides the examination of a theme under a new approach or approach, reaching innovative conclusions."

Based on the bibliographic research carried out, the authors were able to define the cutout of the theme and had theoretical support that directed their reflections as educators and graduate students. The study is anchored in the following works: Demo (2001), Hoffmann (1991, 2015), Luckesi (1997, 2011, 2015), Perrenoud (1999), and Santos (2010, 2016); but it is also based on more recent articles as it is

possible to observe throughout the article. Supported by these works, it was possible to revisit literature scans of renowned authors and to learn more recent research, thus deepening the discussion about the relationship between evaluation as a component of the pedagogical act and constructive error.

3 RESULTS AND DISCUSSION

3.1 EVALUATION AS A PEDAGOGICAL ACT

Notably, when revisiting the ways of making an evaluation, it is pertinent to clarify the express meaning of the pedagogical act that composes the teaching and learning processes. Thus, Luckesi (2015) conceptualizes the pedagogical act that is concretized in different ways in evaluating, planning, and executing, from the initial moment of the preparation of the planning by the teachers to detailing the activities in each class to be taught. This prediction can be initiated with a diagnostic activity that will serve to plan based on the knowledge acquired by the students. This author warns of the need to think that the act of evaluating should not be dissociated from the pedagogical and seen as an obligation of the end of the month or the bimester, in which the time is available to assign grades to students if they learned the contents measured by tests.

In another analysis, Luckesi (1997) identifies three elements that compose the pedagogical act with future implications for desires related to the objectives desired within the teaching-learning process.

Reaffirms,

[...] it is important to know what desire with pedagogical action we practice to the students and whether we want to be delivered to it, so that we can build satisfactory results with the help of planning, execution, and evaluation, helping the development of the students, while processing our self-growth. (Luckesi, 1997, p.167)

In this reasoned understanding of the pedagogical act, it has alluded that the act of evaluating is one of the essential elements within the teaching-learning processes. However, it divides opinions regarding the various ways of conceiving and conducting such a process. In another sense, it is added today that one lives in a plural and demanding society concerning issues with a big scope about the act of evaluating and becomes a duty to rethink for students from various social contexts and participants of this process. For this, one must resume the reflections originated from the desired objectives to be achieved through evaluations within the teaching-learning process.

Of all, Luckesi (2015) predicts that the evaluation proposal is related to the investigation of the quality of something and varies according to the object linked to school learning. Opines, it is necessary to compare what will be evaluated with reflections on the quality of learning. Now, what is intended to be evaluated, for this author will imply the quality of learning within schools when assessing the development of the student's knowledge.

On this, it is important to reflect on what is put, considering that we live in a positivist society and demand high results. Although, despite social pressures, the school cannot lose sight of one of its roles within the teaching-learning process, that is, to train people with quality for a democratic society. However, the questions emerge: how to do this? Is it possible to follow the same line in the ways of evaluating?

Another point of attention of the evaluation refers to people who do not learn equally, because they have different forms of understanding and assimilation times. Therefore, it would not be fair to evaluate "all" in the same way, by the existence of external variables that can influence the performance of a student on a specific day. Even under similar conditions, the results would be diversified due to the time of each. Therefore, the need to diversify the evaluation instruments occurs throughout the process.

Moreover, it is necessary to take into account that the evaluative view is interpretive, that is, it has a subjective character, considering that through evaluation the teacher reveals his theoretical conceptions and his individual perceptions about the student's development. Hoffmann (2015, p. 86) points out that "Evaluation always comes from the interpretation of what is seen. It involves the perceptions, feelings, previous experiences and knowledge of those who evaluate." In this perspective, there is no escaping the subjective character of the evaluation because there is a risk of misusing it from its purpose, which should be understood as an act of reflection and decision-making of each evaluator. Thus, "The way then is to be aware of this interpretative character of the process, because we will begin to doubt our certainties and hypotheses, taking new questions about what is seen, and not definitive answers" (Hoffmann, 2015, p. 87).

Thinking of answers to the questions listed, the evaluation is unveiled as a component of the pedagogical act, as opposed to an instrument used for punishment or classification as an aid in the learning development process. About this, Paulo Freire (1998, p.52) juxtaposes that schools and teachers are aware "Knowing that teaching is not transferring knowledge, but creating possibilities for it's own production or construction". He credits that the perspective of the act of evaluating helps students in the process of building learning.

For a better understanding, Luckesi's thought was taken to synthesize the evaluative processes of learning with their main characteristics and suggest the consequences between assessment and evaluation. As shown in table 1:

Table 1: Differences between Assessment and Learning

Assessment	Evaluation
Loving	Unloving
Inclusive	Excluding
Meaningful learning opportunity	Opportunity to test students' resistance to teacher attacks
Constructive	It's not constructive
Searches for the best of all	Select, sort
Teaching focused on meaningful learning	Teaching focused on test and exam results
Prática pedagógica voltada para uma pedagogia do ensino/ aprendizagem	Prática pedagógica voltada para uma pedagogia do exame
Teacher-student relationship: between people	Teacher-student relationship: it becomes a relationship between things - grades

Freedom	Submission
Spontaneity, search	Fear
Permanent crossing in search of the best	Final arrival
Provas para diagnosticar	Provas para reprovar
Pedagogically: assists in the construction of satisfactory learning	Pedagogically: it centralizes attention in exams and does not help in the learning of students
Psychologically: develops creative and free personality	Psychologically: it is useful for developing submissive personalities
Sociologically: it is useful for processes of social inclusion.	Sociologically: it is useful for the processes of social selectivity. Evaluation is much more articulated with disapproval than with approval and hence its contribution to social selectivity

Fonte: Elaboração autoras com adaptações de Luckesi (1997)

Table 1 visualizes the dichotomy of the propositions between examination and evaluation. It is verified in each type of conception that can meet the different objectives within the teaching-learning process. It is noted that all questions are not limited to the right or wrong parameters but produce contributions to enhance the students' learning.

From this idea, it is established that the evaluation called formative occurs through the help and with conditions that enable didactic-pedagogical improvements in the development of the learning of each student.

From this perspective, it is stated as one that intends to perceive the difficulties of the students, organizing a pedagogical intervention with possibilities of predictions of advances. In corroboration Santos, (2010, p. 12) visions, "[...] its objective is above all to help to understand the cognitive functioning of the student in the face of a given situation proposed to be able to intervene properly", is an assessment that corroborates for personal and social training..

Regarding the evaluation of learning, Santos (2016, p. 641) compared to being very related to summative assessment, explains "[...] it is interesting to summarize what the student has learned or not, what he or she knows or does not know, what he or she is not able to do, at the final moment of a learning cycle [...]".

It is worth mentioning, although it is ideal to evaluate for learning and not learning, it is important to clarify: "[...] the predominant evaluation process is the evaluation of apprenticeships, that is, the evaluation that is characterized as the establishment of hierarchies about the performance of students [...]" (Bolzan, Fernandes and Antunes, 2019, p. 379).

3.2 ASSESSMENT OF LEARNING AND CONSTRUCTIVE ERROR

With queries to the online dictionary Infopédia (2021), it is detected that the word 'error' can be understood from among the semantic senses, as being: decision, act, or incorrect answer; quality of what does not correspond to the truth; deception; assessment or judgment that is at odds with the observed reality; false judgment; lack; blame.

These definitions, according to Luckesi (1997, p. 54.) reflect the heritage of "Western-Christian" culture and its philosophical-religious conception, in which error is seen as a sin and deserves to be punished. In addition, it identifies that our society reflects the concepts inherited from bourgeois society and how the school reflects society, even today, the practice of evaluation directed by traditional pedagogy prevails. As a result, hopes reduce improvements in evaluation practices through tests and examinations with discriminatory, exclusionary, authoritarian, and punitive characteristics, which lead to guilt, and arbitrary and senseless judgments.

Luckesi (1997, p. 48) stresses that the idea of error "[...] only emerges in the context of the existence of a pattern considered correct." It confirms that this Cartesian view is misguided in the rhetoric that "where there is error there is no right" where the responsibility for learning is entirely the student's, exuding the teacher from all the blame. It finds that changing the look on the error consists in understanding that the error exists only imbued with a pattern to be followed, often arbitrarily defined by someone.

In contrast to overcome this traditional view Luckesi (1997, p. 48) argues that it "[...] has led to the permanent use of punishment as a form of correction and direction of learning, taking evaluation as decision support." It delimits that throughout history, the origin of the understanding of error has been transformed into various forms of punishment by exposing students and placing them in a position of guilt because they have not been able to learn.

In any case, error from the perspective of formative evaluation, according to Perrenoud (1999, p. 78) is understood as "[...] every assessment that helps the student to learn and develop, which participates in the regulation of learning and development towards an educational project." In this perspective, the evaluation is conceived as a space for diagnosis, intervention, problematization, and action at the service of the learning of everyone.

In this direction, Luckesi (1997) predicts that the evaluation is consolidated in a continuous process in the possibilities of verifying the constitution of the error in its origin, as well as overcoming them with significant benefits for students and teachers. As a proposition, this author argues that the teacher should accept the student's error as an indicator that something in the teaching-learning process did not go as planned. Therefore, it shows the importance of evaluation as a continuous process, because verifying the constitution of the error and its origin gives us the possibility of overcoming them with significant benefits for personal growth. It infers that, as educators, we need to transcend the view of error as a failure of learning so that it can be considered as an opportunity for reorientation of work, a springboard in search of a better path, thus becoming a source of growth for both teachers and students.

In this perspective, Hoffmann (1991) points out that the error presents great educational potential, considering that, when considering the students' mistakes, in addition to committing to the improvement of learning, the teacher has the possibility of rethinking his pedagogical practice. To this end, the author points out that the teacher needs to understand and identify the mistakes made by the students, to provide

conditions to overcome them, that is, it is not enough to identify the error, it is necessary to resize its conception so that it can be transformed into something positive.

In the interpretation of Demo (2001, p. 50) "Error is not a foreign body, a failure in learning. It's essential, it's part of the process. No one learns without making mistakes." With effects, they encourage that changes in the traditional view of error seen as a problem should be promoted and the principle of new learning should be envisioned..

In the same logic of thought, Nogaró and Granella (2004, p. 6) signal, "Error" should be considered as a constructive form of knowledge, as a source of growth, and not as a tool of exclusion. It is up to the school, the teacher, as direct means the formation of critical identity and non-conformities, to take the greatest step in search of an education that values the experiences of each one and that aims first to raise awareness of the human being, as a social being, of the importance that each one has in the formation of a more just society, less excluding and more interested in being, not doing.

The constructive notion of error takes up the possibilities of disruptions with evaluative practices systematized from the sixteenth and seventeenth centuries in a dimension centered on the traditional ways of conceiving and conducting pedagogical action.

In line, Luckesi, (2011) says that this event has materialized within a theoretical model that presupposes education as a mechanism for the conservation and reproduction of society, that is, at the service of a dominant social model. It denotes that for assessment to assume its role as a dialectical and diagnostic instrument, it recommends placing it in another pedagogical context, to put at the service of a pedagogy that is concerned with the democratization of teaching, to work for the overcoming of authoritarianism and in favor of the development of the autonomy of the student.

For these actions, Luckesi (2011, p. 177) explains

An educational practice that has assessment as its basic resource for building the desired results must be founded on the belief that every 'student learns and by learning develops. This implies daily investment in their learning. In this case, the difficulties should not be a source of discouragement, but challenges that invite the educator to invest more and more in the students. With investment, everyone learns and develops.

It is noteless to resignify the view of error because considering it as part of the learning process certainly covers the constructive way. It is noteworthy that the error is not necessary for the student's growth, but should be inserted as part of intellectual advances and knowledge. Thus, Luckesi (1997, p. 59) reaffirms: "once they occur, we should not make them sources of guilt and punishment, but a springboard for the leap toward a conscious, healthy, and happy life."

Thus, reflect on the error as an important source of growth for students and teachers. According to Esteban (1999, p. 21) "Error offers new information and formulates new questions about the learning/development dynamics, individual and collective". From these perceptions, Esteban (1999) expresses that error often reveals more than the right, because it puts knowledge in a procedural perspective,

indicating what the student knows, what he does not know, and what he may know. For this author, errors can and should be the guide elements of pedagogical actions and interventions, triggering reflections, interventions, and reorganization of teaching work

In this perspective, Santos Júnior and Barboza (2020, p. 14) indicate that "Understanding causes and motivations for student's error is one of the pillars that can help improve the teacher's teaching process and student learning." Thus, when it comes to conceiving error as constructive, it becomes a sieve to understand itself as a constitutive element of learning, which can and should be used as a tool in the construction of hypotheses of knowledge, given respect and appreciation of the student's perspective. Moreover, it should provide reflections on the pedagogical practice of the teacher, as it provides the evaluation and reorientation of his praxis, based on the needs of the students. Resignifying the concept of error implies advances in the conceptions of evaluation as Luckesi (2011, p.294) puts it, "[...] the evaluative acts of monitoring and certification of learning will be our effective allies in achieving success in the results and democratization of teaching."

3.3 CAN ERROR BE CONSIDERED A PEDAGOGICAL COMPONENT OF LEARNING ASSESSMENT?

The theoretical contributions used in this work seek to reflect on the constructive error as a component of the pedagogical act from the perspective of learning evaluation. In this sense, we sought to systematize contributions brought by some researchers about the need to rethink the meaning of learning evaluation, from the perspective of making this process collective and plural to provide spaces for dialogue that break with the logic of the exam used in traditional school, under the positivist paradigm.

From the above, in this article, it is related that the assessment defines a very important role when breaking with the traditional view of classification assessment, in which the evaluative act becomes merit, judgment, punishment, and reward. This occurs when an evaluation is proposed to promote the learning of everyone, thus constituting a democratic space of reciprocity, emancipation, and promotion of learning (Luckesi, 1997, 2011, 2015). Following this logic, Alves, Oliveira, Jucá, and Silva (2020, p. 15) reinforce the importance of positioning the assessment as "[...] an instrument in favor of the student's learning." In this perspective, it is understood as a cyclical process, that allows the teacher to redirect his actions enabling the student's development.

In this context, it is necessary to understand evaluation and planning as inseparable acts, because their execution is at the service of the construction of knowledge by students. It promotes, while planning outlines the future paths to be followed, the evaluation helps redirect the course of action. In these terms, Lourdes, Gomes, and Carvalho (2020) highlight the relevance of diagnostic assessment as an important tool that allows reflection on teaching and learning processes. Thus, it is understood that the act of planning, executing, and evaluating, function as fundamental resources in the teaching and learning process by directing the paths of pedagogical action, with a view to the construction of knowledge.

Nevertheless, the evaluation of learning needs to be seen as a loving act and manifests itself to welcome the real acts and actions, without judgments. In addition, it should provide opportunities for inclusion and integration by offering students support to expand their learning and choose their own paths, focusing on meaningful learning and democratization of teaching. From this perspective, the following question emerges: can error be considered a pedagogical component of learning evaluation?

In this regard, the discussions point to the importance of understanding error as part of the teaching-learning process and consequently as an opportunity to build knowledge from the knowledge constructed by the students, because as Silva (2008, p. 102) points out, the virtue of error "[...] it is in the possibility of constituting a source of growth, for students and teachers, since it allows the recognition of its origin and the procedures and mechanisms that produced it."

From this perspective, the error is now considered as a starting point for decision-making with a view to the necessary adjustments, whether in teacher planning or in the processes that involve students' learning, constituting a rich source of learning and development, favoring the growth of all those involved in the process (Demo, 2001).

Hence, one can understand the error as constructive when used to reorient the teaching practice to know the interests, knowledge, weaknesses, and potentialities of the students, while promoting clear indications about what is necessary to do to move forward. In this perspective Abrahão (2007, pp. 196-197) points out that

The role of the teacher in the perspective of constructive error is fundamental in the sense of respecting and valuing the knowledge that the student brings, starting from these, trigger reflections so that the child can evolve and constitute new hypotheses for the solution of a problem. In addition, by valuing the student's knowledge and starting from the hypotheses constructed by him and the difficulties encountered by him, the teacher can plan the pedagogical action to intervene in this process as a mediator between current knowledge and the new knowledge that the child can develop.

Thus, the role of the teacher is fundamental, considering that he is responsible for guiding students and stimulating their attempts, making them reflect and thus progress in their final, it is considered that education addressed in democratic contexts, resignifies the role of evaluation, consequently from the view of error, in the search to provide opportunities for the development of students, to value their knowledge, driving them to overcome their difficulties in a contextualized humanized and sensitive way knowledge.

Finally, it is considered that education addressed in democratic contexts, resignifies the role of evaluation, consequently from the view of error, in the search to provide opportunities for the development of students, to value their knowledge, driving them to overcome their difficulties in a contextualized, humanized and sensitive way.

4 CONCLUSION

Of all, there is the belief that evaluation is an important component of educational activities and the learning process. Therefore, Luckesi (2011, p. 264) states that can be defined as "[...] a quality allocation,

based on relevant student learning data, for decision-making." Therefore, it should be able to dialogue with the multiplicity and plurality of knowledge that students present.

It infers that as educators, we need to transcend the view of error as a failure of learning so that it can be considered as a starting point for advancement, an opportunity for reorientation of work, a springboard in search of a better path, thus becoming a source of growth for both teachers and students.

In the light of this perspective, it is understood that by resignifying the role of error in evaluative practices, a broad step is taken to break with the traditional view of the classification and exclusionary school, to commit to a dialogical school, welcoming, reflective, constructive, inclusive, that is, truly democratic.

In a sense, it is encouraged to be understandable to delegate to educators to recognize the process of learning evaluation as a mediator of teaching practice, so that the error is concomitant with the pedagogical act and resized in a process of knowledge construction.

As developments for future studies, this article points to the need to conduct empirical studies that corroborate the rethink of the evaluation processes from the resignification of the error, making it a tool to enhance the students' learning. Thus, nuances that involve the specificities of the various actors involved in the evaluation processes of learning, as well as the social context in which they are immersed, point to different realities, with a specific need, factors that alone point to the need to carry out this type of study to guarantee what is desired through evaluation, overcoming difficulties- learning.

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CHAPTER 49

Modern heritage and the architecture of memories: a study on the castelo branco mausoleum in fortaleza

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ABSTRACT

The heritage issue, after nearly two centuries of discussion, is still full of myths and inconsistencies in keeping with the theory and practice of safeguarding assets and thematic accessibility. It is also known that the patrimony demarcates the memorial foundations of the collectivity and should serve the population from its socio-educational capacity, but, in practice, this often does not occur, resulting in the destitution of the sociocultural function of the good. The

question of modern heritage makes the discussion even more ambiguous, promoting polemical debates, detaching the object from its historical value or framing its aesthetic value as mistaken. In this perspective, the choice of the object of study was based on the analysis of the set of the Palácio da Abolição and the Castelo Branco Mausoleum in Fortaleza (CE), as it is a significant landmark for the city in both a functional and formal aspect, housing the headquarters of the state government and composing a daring architectural ensemble in an important neighborhood in Fortaleza. However, looking at it in the semiological perspective of its architecture, it appears that the Mausoleum pays homage to the first president of the Brazilian dictatorial period, making it necessary, therefore, to raise a problematization related to the modern heritage and its function, under the memory architecture perspective.

Keywords: Modern Cultural Heritage, Brazilian Military Dictatorship, Memories Architecture, Castelo Branco Mausoleum.

1 INTRODUCTION

Historically, the term “patrimony” (from the Latin *patrimonium*) has been used since antiquity to designate the inheritance that should be transmitted from parents to children, undergoing some changes over time. According to Magnani (1986), this change “evokes the idea of transmission and, in the case of a collectivity, transmission not from father to son, but from one generation to another. It is worth remembering: what is transmitted are the physical supports, concrete manifestations and effective conditions for the existence of culture”. Despite being an ancient lexical symbol in the semantic field, it is evident that the debate about the heritage theme in the current modern view had its foundations launched only during the French Revolution and was established during the 18th, 19th and 20th centuries, from the perspective of a “no break” with the past, but of “an important inflection of the collectivity's memorial inscription” (SILVA, 2011, p.2). Today it can be defined as the most relevant

and representative set of goods to mark the identity, history and culture of a people, from public policies with state participation through laws, institutions and specific policies, comprising the values and meanings attributed by people to objects, places or cultural practices that promote a sense of collectivity and identification of affective memories.

The sense of heritage, inserted in a context of Romantic ideals of the growing exaltation of nationality from the thoughts of liberal revolutions, boosted the conformation of modern States, relying on its own concept and shaping itself in its boastful commemorative character by becoming a living object of national identity and culture: "Heritage must be understood as a form of rational reorganization of resources for the new collectivity, contrary to the uses that this or that heritage could have imposed, previously, on a given community", according to Poulot (2009, p.99), cited by Silva (2011, p.4). Therefore, in the national context, according to the Instituto do Patrimônio Histórico e Artístico Nacional (IPHAN): "the Federal Constitution of 1988, in its Article 216, expanded the concept of heritage established by Decree-law nº 25, of November 30, 1937, replacing the denomination Historic and Artistic Heritage, by Brazilian Cultural Heritage", also establishing a partnership between the State and society for the protection and promotion of it, updating it for everything of a material and immaterial nature with its management and documentation of the administration's responsibility. public.

The question of modern heritage, especially that said by material, has been spreading in recent decades from the updating of modern thinking - since it is not possible to say a complete rupture, since the influence of modernism is rooted in our way of thinking and to design - with the contemporary mentality. In the field of Architecture, the controversy linked to this type of debate is evident, thus often raising speeches without much theoretical or practical foundation, which ends up giving rise to certain negationist attitudes, as is the case of the São Pedro Building. also in the city from Fortaleza. This work, dating from the 1950s, for example, now suffers numerous reprisals from the real estate market and an absurd disregard on the part of the government. In an excerpt taken from an article in the *Diário do Nordeste* newspaper in April 2021, after the collapse of a part of the building causing the death of a young woman, the owner Francisco Philomeno Júnior declared that he did not have the necessary resources to protect the building and that he was informed of the City's lack of interest in listing.

Figure 1. Clipping of a virtual newspaper article about the situation of the São Pedro Building



In another problematic view involving heritage is the question already addressed by Fundarò e Silva (2015, 2016 and 2020) about the immateriality of the material. Munoz Vinas (2003), as well as Carsalade (2012, 2104), emphasizes the phenomenological aspects of heritage, bringing to the fore the arguments linked to the symbolic values projected in an architecture and, consequently, how the conservation of its history is carried out, as well as the execution of its sociocultural function. Furthermore, Frempton (1997) rightly points out that there was a temporal overlap between the production of architecture linked to the modern movement and the political-social conjunctures characteristic of different nations in the last century, sometimes linked to dictatorial regimes, such as Brazil. Therefore, the present article comes as a contribution in this reflection proposing analyze and problematize the vision of modern heritage from the perspective of the monumental building - in particular, the Castelo Branco Mausoleum of the Palace of Abolition located in Fortaleza (CE) - with the objective of guaranteeing bibliographic support for the study and appreciation of this theme. Therefore, the methodology used in this work was based on the bibliographic review of theorists of heritage issues, as well as the use of a primary survey of data from research carried out by remote means due to the COVID-19 pandemic , in an attempt to promotion of bases for the insertion of the discussion in the civil sphere.

2 THE BRAZILIAN MILITARY DICTATORSHIP IN CEARÁ AND THE PARTICIPATION OF CASTELO BRANCO

It is known that the period from 1964 to 1985 was an obscure milestone for the history of Brazilian democracy, where there was a restriction of individual freedoms, as well as harsh repressions

against movements against the government and the denial of ethics and morals, from the annulment of basic human rights issues. Historically, the strong nationalism inherited from the 1930s with Vargas contributed, together with protectionist policies, to the so-called “communist threat”.¹

This limitation of human rights was also strongly present in Ceará, where the Institute for Research and Social Studies (IPES) and the Instituto Brasileiro de Ação Democrática (IBAD) – front institutions supported by the Escola Superior de Guerra (ESG) – “saturated the radio and television with their political and ideological messages”, in the words of the Uruguayan researcher René Dreifuss (1987, p. 232).²The coup that started on March 31 and April 1, 1964, did not have much resistance from then President João Goulart, as he prevented the conflict in question from becoming internationalized with the so-called “Operation Brother Sam”, American support for reprisal policies. to the communist movement (FICO, 2014). In Ceará, there was a certain instability in the support of the governor Virgílio Távora due to his proximity to João Goulart, having always acted with fear and only showed support for the dictatorship when forced by the military. At the time of the coup, not all barracks were in full harmony, yet several inquiries were carried out in military units and in Northeastern society, aiming to politically and ideologically mitigate any manifestation against the regime (CONCEIÇÃO, 2016).

In addition, it is also worth mentioning the participation of the support of the clergy of Ceará who collaborated in favor of the military forces, holding the "Mass for the victory of democratic forces" celebrated by Archbishop José Delgado, in addition to the "March of the Family with God for Freedom" , to demonstrate the union of civil society with the interests of forming a front against the feared communist advance in the country.³

The participation of Humberto de Alencar Castelo Branco, marshal of Fortaleza, in the dictatorial regime, was in his contribution as the first president of this period. Historically, the military

¹ On this last point, it is worth mentioning that it was not something inserted in the community by the military, however, they knew how to work as staunch opinion formers at the time, promoting and intensifying the fear already found in civil society to make the country similar to the countries communists of the time.

²In addition, there was intense support from political and business groups from Ceará, such as Adolfo Gentil (PSD), Costa Lima (UDN) and Dias Macedo (PSD).

³ On the other hand, important names of the clergy fought strongly for the right to freedom and against the usurpation of human rights, such as Bishop Dom Antônio Fragoso in Crateús, Dom Walfrido, Father Oswaldo and Father Pedro Van'Oll in Sobral, Dom Delgado and Frei Tito in Fortaleza, among others.

had participated in the 1930 Revolution and other historical events, such as his role in World War II in Italy and his participation in the administrative remodeling of the Army that ensured Juscelino Kubitschek's inauguration. In 1963, he was elected Chief of Staff of the Army by the then President of the Republic João Goulart and, in the following year, he contributed to his dismissal, justified as a temporary measure to solve the problems caused by the advance of the “Leninist-Marxist danger”. and the high inflation of the country's economy and then restore and consolidate democracy (NOBRE, 2012).

Figure 2. Marshal Humberto de Alencar Castelo Branco



Source: Ceará Yearbook, 2020

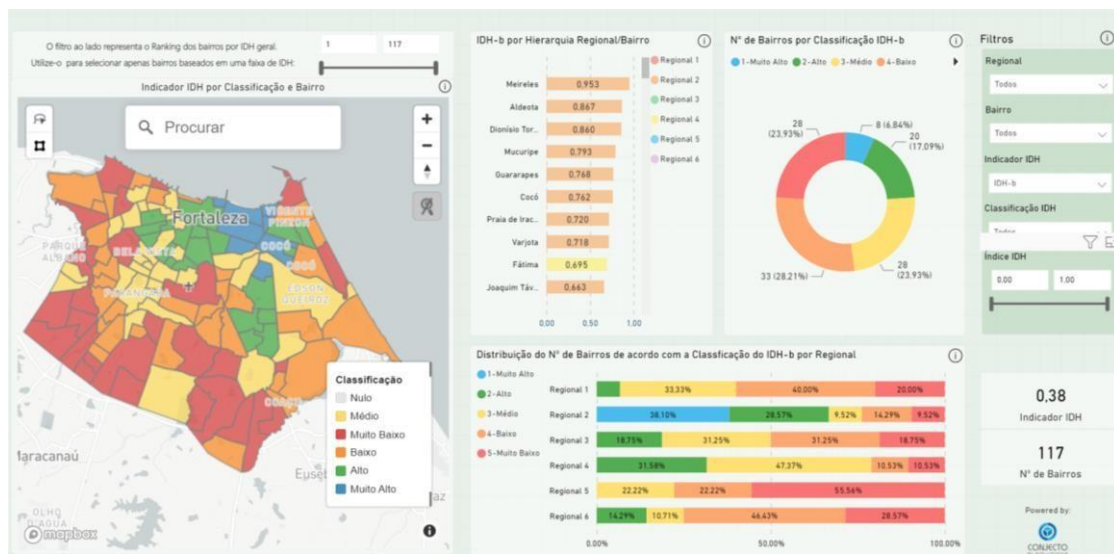
Despite not having been a soldier of the so-called "hard line" - a current more linked to the US intelligence service with its greatest exponent in Costa Silva, who established the AI-5 -, the marshal still promoted harsh repressions, abolished political parties, creating only the National Renewal Alliance (ARENA) and the Brazilian Democratic Movement (MDB), the only ones allowed until 1979, in addition to the creation of the first institutional acts and a project for a new Brazilian constitution. He ruled the country from April 15, 1964 until March 15, 1967, when Costa e Silva assumed the presidency, even though he was not supported by Castelo Branco, who only refrained from the issue to prevent "a confrontation from causing a rift in the Army, which could culminate in a military confrontation, further reducing national sovereignty", according to General Newton Cruz, cited by Nobre (2012). On July 18, 1967, the former president is the victim of an accident, suspected by some ,⁴ of an air collision and dies.

3 THE PALACE OF ABOLITION ENSEMBLE

The Palácio da Abolição complex comprises an entire block located in the Meireles neighborhood, specifically at the intersection of Av. Barão de Studart – type I arterial road – and Rua Deputado Moreira da Rocha. Located in one of the most important neighborhoods in the history of Fortaleza and the result of the speculation of urban expansion that began in the 19th century in the *Belle Époque* , from the displacement of the elite to new regions, such as Meireles and Aldeota, in response to the migratory movement. from the interior of Ceará to the Center, until then the most popular neighborhood in the city. Currently, the neighborhood is part of Regional II and has good infrastructure, as well as the highest HDI in the capital and an excellent relationship with the city's tourism, due to its proximity to the coastal region.

⁴“Castelo Branco died, shortly after leaving power, in an air accident, which was poorly explained in the military inquiries, which took place on July 18, 1967. An FAB T-33 fighter hit the tail of the Piper Aztec PA 23, in which Castelo Branco traveled, causing the PA-23 to crash leaving only one survivor.” (NOBRE, 2012)

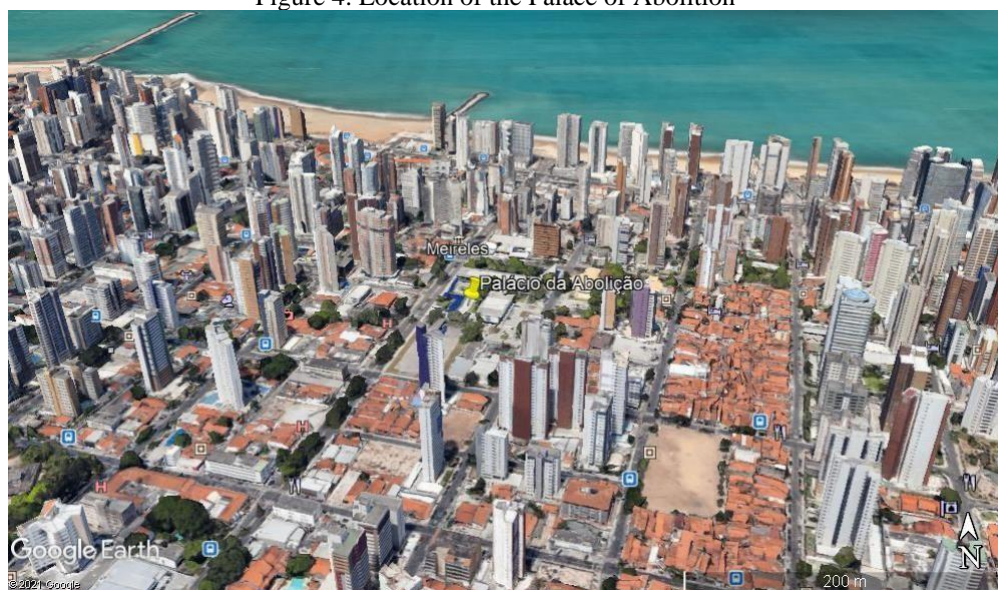
Figure 3. Research on the Human Development Index by neighborhood in Fortaleza, with HDI categories Education, Longevity, Income and the classification of each neighborhood.



Source: Ceará Yearbook, 2020

The object of study in this article is made up of four buildings: the Palácio da Abolição, which functions as the governor's residence, located across the length of the land and in an area closer to the sea; the Dispatch Office, currently known as Annex, perpendicular to the first, and connected to it through a walkway; the Chapel, on the northeast corner of the land, and the Mausoleum of Presidente Castelo Branco, arranged in a large cantilever over an excavated square that occupies a large part of the land. Commissioned in the 1960s by the then governor Parsifal Barroso to the architect from Rio de Janeiro Sérgio Bernardes, with landscaping by Burle Marx and his intern Fernando Chacel and signed by engineers José Alberto César Cabral and Rui Filgueiras Lima, the project, covering approximately 4 thousand m², had its intervention started only in 1965 with the then governor Virgílio Távora.

Figure 4. Location of the Palace of Abolition



Source: Google Earth, 2021

The work was inaugurated during the administration of Governor Plácido Castelo, in 1970, who moved the headquarters of the Executive Power of the State of Ceará from the current Palácio da Luz, a 19th century project located in the Center, to the Palácio da Abolição. In 1987, Tasso Jereissati transferred the headquarters to the State Administrative Center located in the Cambeba neighborhood. On May 17, 2004, the Palace of Abolition was listed as a state-level landmark, in a process submitted to the State Council for the Preservation of Cultural Heritage for its recognition and importance as a heritage of modern Brazilian architecture, based on its clear characteristics. of movement: shape, arrangement of volumes, conformation of internal spaces and use of materials. As a result, the complex was partially recovered by the State Government to be used as a place for official receptions and a Cultural Center, where until 2008 it housed the Department of Culture, the State Council for Environmental Policies and Management (CONPAM) and the Public Security and Social Defense (SSPDS). Between 2009 and 2010, the Palace underwent a renovation during the Cid Gomes government, having been reopened on March 25, 2011 as the Official Residence and seat of the Government of Ceará.

For this, the original project was rehabilitated and restored to once again be the headquarters of the Ceará executive by the Department of Architecture and Engineering of the State of Ceará (DAE), which carried out the process of modernization of the complex with the objective of preserving its historical value by be an asset protected by State Heritage legislation. To this end, the DAE's technical team updated the original plan considering the new demands of the government and preserving its immeasurable architectural value. The external aspect of the work was fully preserved, including the glass and iron tilting, as well as the wooden elements that enrich the entire volume of the buildings. In

addition, there was the inclusion of two control gates and a new membrane for the walkway, formed by a wooden lattice with small acrylic closures to give the appearance of lace, a piece of Ceará handicraft.

Figure 5. Palace of Abolition Complex



Source: Archdaily, 2013

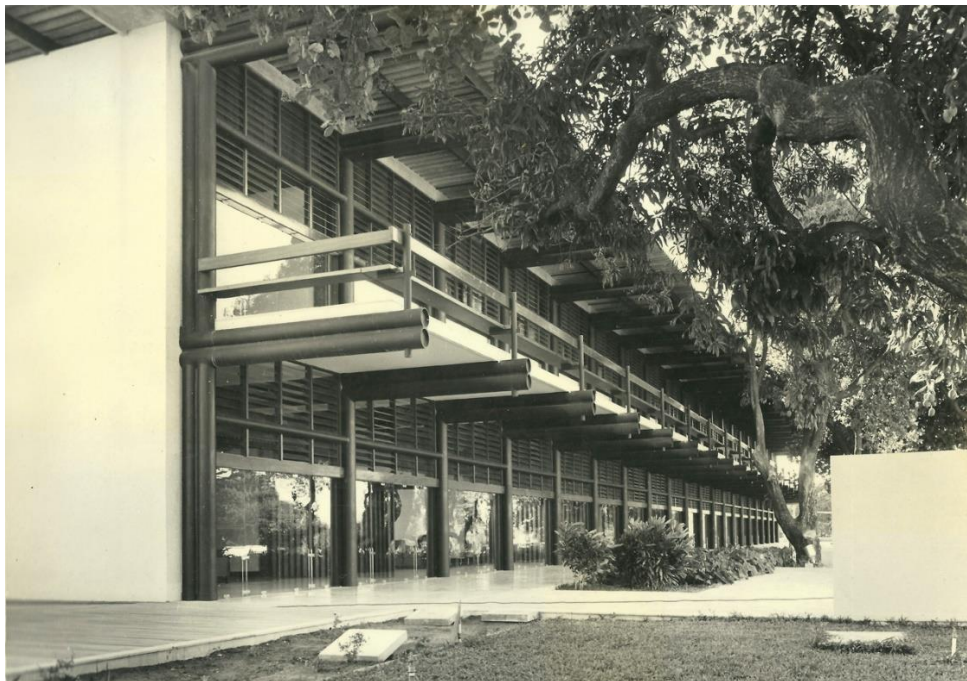
3.1 THE PALACE OF ABOLITION

The headquarters of the Government of Ceará, a classic of modernist architecture in Fortaleza, follows a style based on the mastery of the use of concrete and steel, in addition to the adoption of balconies surrounding the entire main building, demarcating a bioclimatic strategy typical of the Brazilian northeast. As a project of the third generation of Modernism, the architect works very well with the potential of its position and its superimposed location in the altiplano – at the top of the descent to the coast, with a very privileged view – and composes the set basically through pavilions.

The dominant elements are based on self-supporting structural frames composed of double steel tubes painted in black, acting as support for the masonry walls. On the north and south facades glazed with tempered glass, these advance to form the aforementioned balconies, where on the upper floor the railings are made of wood in the form of benches, while on the east and west facades there is a ceramic coating and, on the covered, asbestos shingles in a ridge, with longitudinal gutters. Its main structure is assembled using Mannesmann tubes, made of special seamless steel, composing modulated pillars

and beams, to give a mimetic visual effect to locally used carnauba trees, in addition, Peroba, Cinza Biré marble and stones stand out. from Piauí and Paraíba for finishing materials. The main door of the building is in carved wood and gives access to a large double-height hall that opens onto the garden on the north side of the plot. The block houses the area for official dispatches on the upper floor, a multipurpose auditorium in the basement and the entire flooring is in gray marble, with the exception of the residential area, which is in plank.

Figure 6. View of the balconies of Palácio da Abolição



Source: Archdaily, 2013

3.2 THE DISPATCH OFFICE (ANNEX)

The annex block, which housed administrative activities to support the government, is located across the Palace block and follows the same construction system, but without the balconies. Its east and west facades are formed by glass tilting windows with wooden mullions between the porticos creating window frames that go up to half of the ground floor, completed with masonry walls. The north and south facades are covered with ceramic and also have tilting frames in the circulation areas. The main access to the block is made between two porticos on a higher floor from a semi-closed walkway. The building also houses the Civil House sectors, the refectory and the water tank that supplies the entire complex.

3.3 THE CHAPEL

The chapel, at the northeast end of the complex, is in the lowest part of the land and has an architectural proposal in the form of a $\frac{1}{4}$ pyramid, embedded in the basement and having its part visible only from the roof with a cross at the top and from inclined planes formed from triangles with hypotenuses supported on the beam/gutter.

Two flights of stairs converge to the temple's single access, where the pillar that supports the roof structure is located. Two walls with triangular termination stand out behind the altar, presenting decorative reliefs, with small openings, where at the meeting of these walls, there is a narrow strip with bluish glasses arranged vertically. The floor plan has a well-defined square shape, where the services take place, and the other walls are rectangular and unadorned. The floor of the chapel is marble, with the exception of the baptistery area, which is wooden.

3.4 THE CASTELO BRANCO MAUSOLEUM

Figure 7. Construction of the Mausoleum



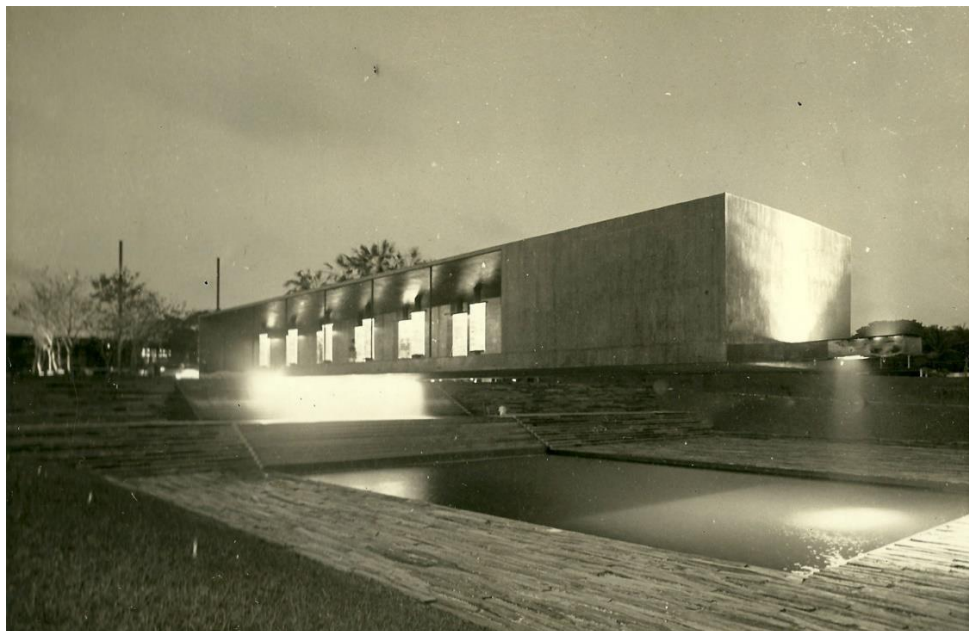
Source: Archdaily, 2013

The Castelo Branco Mausoleum, a work in honor of former president Humberto de Alencar Castelo Branco where his remains are kept, was only opened in 1972, south of the ground floor. A work of great architectural boldness and structural mastery, the monument is an elongated prismatic volume with a large thirty-meter swing, projecting over a reflecting pool and a square paved with juxtaposed sleepers, made of rustic wood, surrounded by grassy slopes.

Composed of a large reinforced concrete structure with a cross section similar to a “Y”, with a balance of approximately thirty meters, whose base and support correspond to two ninths of the total length. At the end of the balance, two other ninths correspond to the internal space of the mausoleum itself, where only the roof of the “Y” section continues, therefore, interrupting the vertical structure for the configuration of a single space. The Monument is formed only by two parallel and open corridors separated by their “Y” structure, joined by the Mausoleum at the end of the swing. The burial chamber at the end, where the remains of the ex-president and his wife are, is reached after the galleries situated along the building.

3.5 THE PROBLEM OF THE CASTELO BRANCO MAUSOLEUM

Figure 8. Castelo Branco Mausoleum



Source: Archdaily, 2013

The Monument and Mausoleum of President Castelo Branco was inaugurated on July 18, 1972, with the arrival in Fortaleza of the remains of General Humberto de Alencar Castelo Branco and his wife, Argentina Viana Castelo Branco ⁵. After the marshal's death in July 1967 in a plane crash, the memorial was erected mainly at the motivation of the former president's son, who kept the archives of the father in his house in the South Zone of Rio. With the inauguration of the memorial, these documents were released, which are now in the Army Command and General Staff School and exhibit liberal aspects of the late dictator. On the opening day, those who worked with the marshal were invited, including the then vice president Augusto Rademaker, ministers from the Medici and Castello Branco governments, governors, parliamentarians and military commanders, in addition to the president of Petrobras at the time, Ernesto Geisel.

Currently, instead of Castelo Branco's personal pieces, the memorial features plaques with excerpts from letters and speeches by the former president. For example, one of them mentions phrases such as the “mottos of the revolution”, to “restore legality”, sent to the division commander on the morning of March 31, 1964, the day of the coup. On another plaque, there is an excerpt from a letter sent by him to his son at the beginning of his term, where he said: “I am truly a symbol of bankruptcy, whose bankrupt estate is in incredible disarray”. One of the plaques also brings Castelo Branco's personal amendments to Institutional Act number 2. The articles predicted that his term and that of the vice president would end on March 15, 1966 and that the election for the positions would take place in December of the previous year, however. the marshal held the post until March 1967.

The project by the architect from Rio de Janeiro is full of philosophical symbolism which transcends the material while clinging to it to ensure the maintenance of the idea of homage to the strength and power of the former president. The walls of the suspended part of the construction represent matter, while its shadow in the water mirror demonstrates the relationship with the spirit. The floor around the building is mainly composed of pieces of wood with spaces between them filled with stones, which, in addition to obvious reasons of permeability, tends to influence the look down of people who walk there, as if they were paying obeisance to Castelo. White. In addition, even the vegetation carries symbolic traits where the yellow ipês represent the country and the purple ones exercise a function of permanent mourning for the death of the ex-president and his wife, while the carnauba trees in profile serve to represent soldiers watching. the mausoleum (CASTRO, 2014).

As can be seen, the building itself has numerous architectural symbolisms in the formation of its space, for example, the great balance of monumental value as if it represented an allusion to strength

⁵ Brought on the destroyer – a type of vessel – Santa Catarina, commanded by Captain Paulo Castelo Branco, the couple's son, and with the participation of the then president Emílio Garrastazu Médici and several other military authorities.

and power, noted in countless other architectural objects throughout of history from ancient commemorative obelisks, palaces, castles, temples, etc.

Architecture as a symbol of grandeur is not something current, including the works in honor of dictators and repressive figures of the last centuries. Emerging as a problem different from the usual in the patrimonial scope, the question highlighted in the architectural set rests not on its preservation as a built object, but on the semantic field that deepens the architecture of memories, touching

including the idea of intangible heritage. According to Liberal de Castro in his publication “Preservation of cultural heritage” for the Instituto do Ceará magazine, he states that:

“The uncontained and systematic destruction of different testimonies of our cultural heritage has promoted a fair and necessary reaction to the abuses, practiced in an aggressive and inconsequential way by members of the most diverse social strata [...] almost all, studies are still limited to buildings and works of art, an explanatory fact for the old connections of architects and professionals related to the subject”. (CASTRO, 2008)

Figure 9. Memorial plaque at the Castelo Branco Mausoleum
Source: Archdaily, 2013



In this context, it is worth raising a question: what about when destruction is not material, but immaterial, turning the architectural object into something bordering on the void of historical significance and sustaining it only in its formal and functional aspect? In addition, the rigid view of modern heritage, under its conservationist aspect, should not be reevaluated due to the many inconsistencies, where in a city such as Fortaleza, with numerous heritage sites in the process of neglect and destruction, they share their historical-cultural space. with a building in honor of a key figure from the period of the military dictatorship?

It is a fact that the years from 1964 to 1985 were an obscure stain in the history of recent Brazilian democracy ⁶, and therefore something to be repudiated and never repeated, where, in this aspect, the Constitution, a supreme legal reference, of 1988 is very clear. Furthermore, it would be imprudent to say that a building is completely empty of its historical significance, but it is completely necessary to problematize when it is not manifesting this potential, mainly in a way that ignites or materializes the history of a society for the people who there they live or enjoy the space.

As analyzed, the set of the Palácio da Abolição, in all its architectural objects, represents a primacy of the Ceará school of architecture in all its formal, structural and functional areas. In addition to being a symbol for the state, bearing in its name the brand that Ceará, land of light, is known for: the first state to guarantee the abolition of slavery - including the Abolition Medal is delivered there on the 25th of December. March to personalities for their contributions to society. In this way, it appears a certain inconsistency that such an important and significant work for the people of Ceará and Brazil should be linked to the memory and tribute of a protagonist figure of a historical and constitutionally recognized period as something to, paraphrasing Mozart Vianna, “never be repeated”⁷.

In this scenario, to support this argument, a remote survey was carried out (because of the COVID-19 pandemic), through an online form, and essential to analyze the relationship of the inhabitants of different regions of Fortaleza with the work, in addition to their knowledge of Heritage. Some questions were proposed to the 80 research participants and below is a compilation of the answers obtained . Briefly, in the graphs, the answers revolve around yes and no and, in the tables, they are cadenced with respect to an approximate level of relevance for the person.

⁶ By recent, it refers to the fact that this has a very troubled relationship from its foundation to the present day when comparing the number of times in which it was attacked in such a short time of existence.

⁷“Today it may seem that it is too detailed, but those who were at the time know that things happened in the regime of forces that we needed to never happen again in Brazil. There were violations of individual rights, imprisonment without a court order, torture, deaths. It was necessary to put a stop to these things never happen again. Nothing better than putting it in the Constitution”, comment by Mozart Vianna, a constituent of the Constituent Assembly. At [https://www.gov.br/pt-br/constituicao-30- anos/textos/democratica-constituicao-federal-de-1988-foi-construida-pela-sociedade](https://www.gov.br/pt-br/constituicao-30-anos/textos/democratica-constituicao-federal-de-1988-foi-construida-pela-sociedade), accessed 05/29/2021.

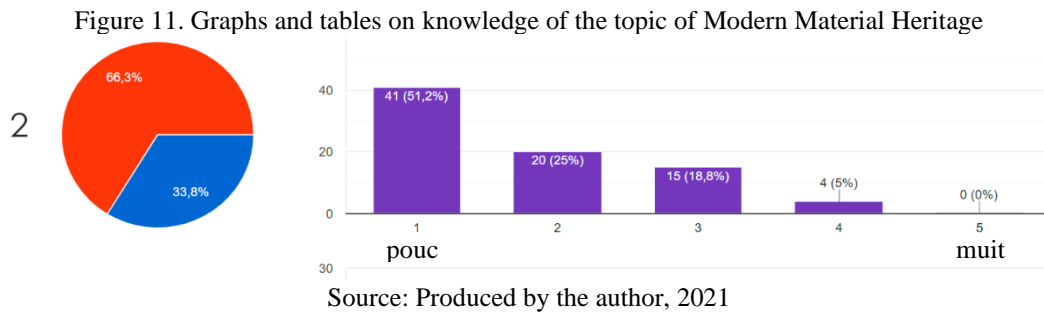
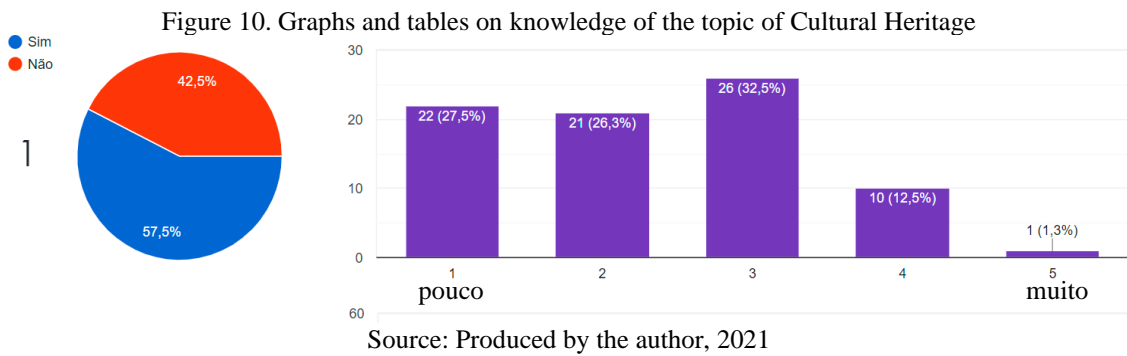


Figure 12. Graphs and tables on knowledge of the heritage of the Palace of Abolition and its personal relevance and for the city

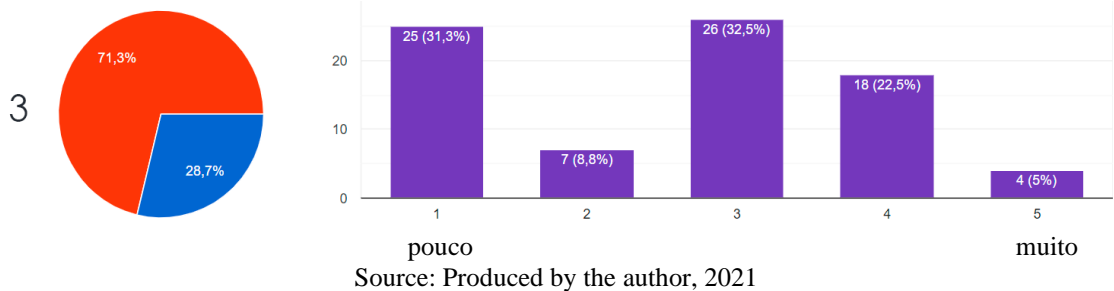


Figure 13. Graphs and tables on the knowledge of the symbolic tribute character of the Mausoleum, as well as the permanence of the marshal's remains for the graph and if the knowledge of this fact influences the change of perception of the place for the table

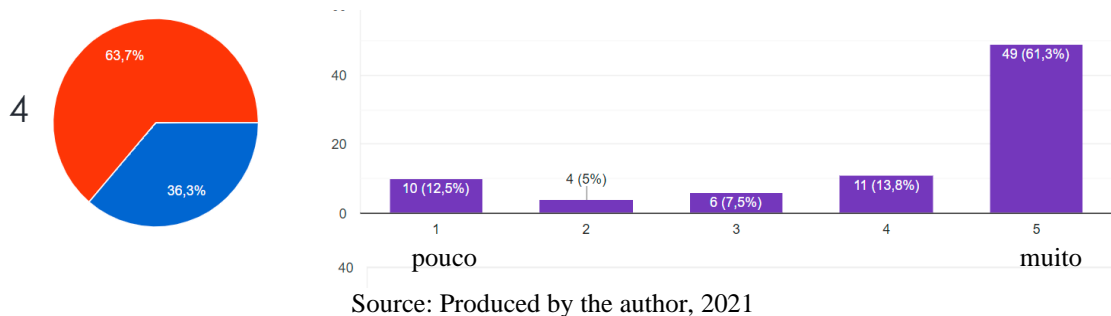
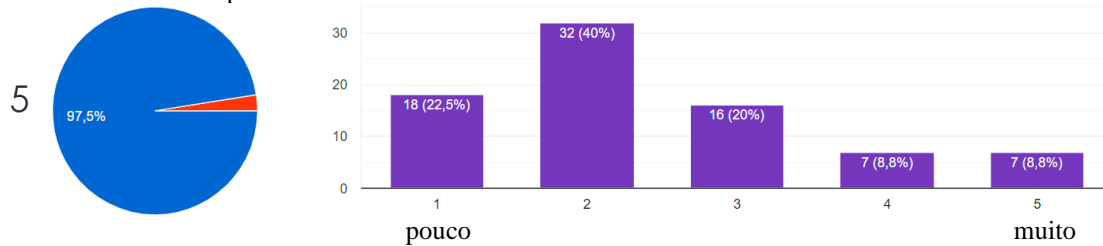


Figure 14. Graphs and tables on whether heritage architecture should exercise its sociocultural and historical function for the graphic and how this relationship exists in Fortaleza for the table



Source: Produced by the author, 2021

It can be inferred, therefore, that the building is not developing its full sociocultural function as a modern heritage for society, even though it is in a good state of conservation and preservation and is a great exponent of the Fortaleza architecture school. From the initial research, it is impossible not to notice the level of strangeness when one enters the question of modern material heritage, in addition to the lack of knowledge of the set treated in the article as a listed property, even though it is considered by the participants as relevant to them. Concomitantly, a good part claims not to have knowledge of the memorial character of the Mausoleum, noting that they have changed their perception of the place after the knowledge that it is a building in honor of the first president of the Brazilian Military Dictatorship. Finally, it is still possible to criticize the city of Fortaleza's failure to properly value heritage from the data obtained, in which almost all participants believe in the need for heritage architecture to perform its function, but which many believe they do not observe. This concretely in the capital of Ceará. One of the research participants made the following report related to the heritage issue in Fortaleza:

"I don't know, the feeling of being in an old space, which exudes a lot of history, is one of the most interesting. If that space is in a good state of maintenance, it's a total pleasure. I don't know, it's about going to Cineteatro São Luís and sharing your eyes and thoughts between the movie that's on and the richness of that ceiling, those walls, that stage. I used to go there as a child with my mother, it was closed for so long and then I was able to go back. Something happens in my heart, you know? It is difficult to explain the importance of this, but having spaces like this in the city is a kind of breathing space... they are spaces that let us dream."

This issue also implies the debate on the need to insert the imaginary involved in the issues of intangible cultural heritage in order to understand the phenomenological dimension of the architectural object and its role in influencing the culture of societies, as Liberal rightly addresses when talking about this theme:

"In ancient Rome, along with the origin of the word, correlated with the land, with the countryside, the culture of the spirit was also accepted. Thus, cultural heritage is composed of the collection of goods produced by human ingenuity, created by the

mind, and can be divided into intangible heritage and material heritage. [...] The systematization and expansion of the field of study of the various modalities of intangible heritage proceed, however, from much more recent propositions, since they obtained international seal only when UNESCO sponsored the realization of the Convention for the Safeguarding of Cultural Heritage and Natural Mundial, in 1972. Later, in 1989, the Recommendations on Safeguarding Popular and Traditional Culture were published, in which bases were established to activate efforts in favor of preserving the since so called 'intangible cultural heritage'". (CASTRO 2008, p.101-102)

It is surprising that, in a city divided by the government's negligence with certain heritage remnants and the violent invasion of the real estate market, one of the best preserved assets is found, as it was found here, not exercising its due phenomenological role for the culture of the spirit. , a fact confirmed by the research carried out, where the value projected on it by the community does not find any real correspondence with the values it intends to honor. Finally, it is interesting to note that, in an article published for the Globo newspaper in 2014, the journalist Juliana Castro addresses the issue of the movement of local visitors a while after the restoration and reopening of the complex, in which she notes that there is low demand for visitation. , when there are no school visits, with an average of three people per day, which demonstrates its low direct influence on the city's residents. Finally, for Fundarò, (2018) the loss of significant value of a building is comparable to the loss of value in use, still weaving the argument from Dezzi Bardeschi (2004), where for him to conserve buildings without meaning and without use it is how to declare "the death of our cities".

4 FINAL CONSIDERATIONS

The main objective of this article was to support the argument on the non-development of the sociocultural potential of the modern heritage in the figure of the Palácio da Abolição, more specifically in the building corresponding to the Castelo Branco Mausoleum. However, when observing and analyzing the set of the Palácio da Abolição, this potential existing in the Mausoleum building is not being fully and correctly manifested for society, raising numerous questions about how this could be resolved, combining the preservationist issue. from modern heritage to the architecture of memories strongly present in the building. It is possible to affirm and validate the argument discussed in this article from the studies of Liberal de Castro, which contributes to the debate on the potential of the symbolic value of architectural heritage with the following speech:

“While this meaning, at least in part, comes from the lack of knowledge of other types of cultural heritage, in reality, it also stems from the high symbolic power of works of architecture, a power to which the affective bonds of the populations that live with them are added, because they can be found in public spaces, made available to all, permanently and free of charge. Faced with such a situation, intellectual or sentimental involvement, stimulated by sensory contacts and reinforced by personal or collective

memory, triggers concerns and provokes reactions to the prospect of destruction of architectural works”. (CASTRO, 2008)

According to Choay (1925, p.18): “the monument assures, calms, reassures, conjuring up the being of time”, therefore, it is crucial to claim this phenomenological characteristic of the building, since it cannot exercise a tranquilizing purpose. when referring as a form of tribute to one of the exponents who contributed to the maintenance of such a dark past in national history. According to Fundaro :

“The dialectic between the terms “memory” and “cultural heritage” configures the existence of a collective consciousness of appropriation and recognition of the past by the present and necessarily a perspective of transmitting a value to the future, guaranteed by the idea of preservation. A dialectic that we often recognize as antinomic, with regard to the concepts of memory, heritage, what to conserve or eliminate, what to safeguard or recompose.

The issue of preservation is related to a recognition of value, be it aesthetic, material, symbolic, cultural, ideological or historical. Such recognition conditions and legitimizes the action of safeguarding, or not, a material object. Among the built objects, those perceived as bearers of cultural or symbolic value, of artistic, historical and documentary significance, for which, consequently, there is an interest in transmitting them to the next generations are selected. This as representative for the time itself. What is transmitted, from the past to the future, in this selection work is, therefore, essentially the contemporaneity itself .” (Fundaro, 2017, pp 11-12)

Thus , the need for a current intervention in the listed property in question is widely needed, respecting the heritage laws and ensuring its preservation, perhaps from a re -signification of the signifier of its space, as it is an example of modern Ceará architecture, in addition to be recognized by the majority of the community as a “fundamental part of the city” –In this way, the building could have its full service to society, inserting a new context in the heritage debate, about the vision of personal and collective memory sensations to guarantee the democratic maintenance of teaching about the history of a society. It is possible to punctuate, in parallel with the discussion raised here about the mausoleum, the issue of the destruction and removal of statues and monuments that honor slave and colonialist characters in the anti-racist demonstrations of the years 2019 and 2020 that started from the denial and questioning of the current symbolic value of these monuments. Finally, on the basis of these arguments, it is evident that the need for a new reflection on the heritage listed property in question, respecting the heritage laws and guaranteeing its preservation from a re-signification of the space, through a participatory process that could involve the community in the definition of what to honor and what are the values that if you want to pass it on to the future. In this way, the building could exercise its full service to society, inserting a new argument in the heritage debate, linked to the role of architecture and cultural heritage didactics . Therefore, according to Fundaro, from the Benjaminian

concept of Fantasmagoria ⁸, “focusing our interest on an implicit skewer in the latter, that is, on the ability of objects to represent something beyond what they are materially” (Fundaro, 2020, p.784). From personal and collective memory sensations to guarantee the democratic maintenance of teaching about the history of a society, because Ceará society must have the right to decide who to honor in a space and in a place that is primarily its own and, only later, of the institutions.

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CHAPTER 50

Profile of tuberculosis cases in pernambuco: analysis of cases, 2011 to 2020

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ABSTRACT

Tuberculosis is an infectious disease caused by the *Mycobacterium tuberculosis hominis*. In developing countries, such as Brazil, it remains a prevalent infectious disease. Tuberculosis is transmitted through the elimination of bacilli by the respiratory route and its infectivity is directly related to the immune status of the individual. The article aims to identify the profile of confirmed cases of tuberculosis in the period from 2011 to 2020 in Pernambuco. This is an observational, descriptive, quantitative and longitudinal field study, in a time frame from 2011 to 2020. Secondary data were collected from the website of the Department of Informatics of the Brazilian Unified Health System (Datasus), specifically from the Information System of Information on Diseases and Notification (SINAN). The variables were standardized through rates per 100 thousand, with the following variables: sex, race/color, age group, education, form, and closure, analyzed descriptively by means of absolute and relative values. According to the results observed in this research, the cases of tuberculosis mostly occur in mixed-race men, aged between 20 and 39 years, with a blank field of education (and followed by 1st to 4th grade of elementary school), presenting the pulmonary clinical form and with closure situation with cure achieved.

Keywords: Tuberculosis, *Mycobacterium tuberculosis*, Health Indicators, Epidemiological profile.

1 INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by the *Mycobacterium tuberculosis hominis*. In developing countries, such as Brazil, it remains a prevalent infectious disease. Tuberculosis is transmitted through the elimination of bacilli by the respiratory route and its infectivity is directly related to the immune status of the individual.

According to data from the Computer Department of the Brazilian National Health System (DATASUS), registered in the System of Information on Diseases and Notification (SINAN), Brazil had 83,678 confirmed cases of TB in 2020, of which 6,068 were from the state of Pernambuco.

In this context, the present research seeks to analyze the profile of tuberculosis cases in Pernambuco, in the period from 2011 to 2020. Thus, in light of the above, the following questions are posed: What is the profile of TB cases in the state of Pernambuco?

Our hypothesis is that the profile of TB cases in Pernambuco follows the same pattern as in Brazil.

The research has as a general objective: To identify the profile of confirmed cases of tuberculosis, in the period from 2011 to 2020 in Pernambuco. The specific objectives are: To perform the temporal analysis of tuberculosis cases in Pernambuco, in the years 2011 to 2020; to trace the profile of tuberculosis cases in the state; to compare the profile of cases in Pernambuco with that presented in Brazil.

As tuberculosis is a treatable disease of priority control in the country, the analysis of its occurrence in Pernambuco becomes indispensable, thus enabling the tracing of new paths for the planning of prevention and combat actions.

This is an observational, descriptive, quantitative and longitudinal field study, in a time frame from 2011 to 2020. The interval analyzed corresponds to the last ten years available in the system. Secondary data were collected from the website of the Informatics Department of the Brazilian Unified Health System (Datusus), specifically from the System of Information on Diseases and Notification (SINAN). The variables were standardized through rates per 100 thousand, with the following variables: sex, race/color, age group, education, form, and closure, analyzed descriptively by means of absolute and relative values.

2 DEVELOPMENT

Tuberculosis (TB) represents one of the major infectious diseases responsible for mortality in adults (GOLDMANN, 2011; WHO, 2014). Its etiological agent is the *bacillus Mycobacterium tuberculosis*, also known as Koch's bacillus. The dissemination of this bacterium occurs mainly through the air (aerosolization of contaminated secretions), and also through direct contact with an open wound. Individuals with cavitated pulmonary tuberculosis (tuberculous cave) are the main source of infection, due to their frequent coughing and sputum with high concentrations of the bacteria (GOLDMANN, 2011, WHO, 2014).

The bacillus can compromise different organs of the body, which determines the classification of its form. If it affects the lungs, it is classified as pulmonary tuberculosis - the most commonly found form - while its manifestation in other organs is called extrapulmonary tuberculosis (GOLDMANN, 2011; WHO, 2014).

Tuberculosis is considered a serious public health problem worldwide and has been perpetuated throughout human history. In 2018, it was considered the infectious disease that killed the most in the world (WHO, 2018). Characteristics such as the current scenario of the migratory process, added to the financial crisis and political instability have contributed to the maintenance of the TB transmission chain in developed and developing countries, as is the case of Brazil (ANDRADE et al., 2017).

Brazil ranks 18th in TB burden, representing 0.9% of the estimated cases worldwide and 33% of those estimated for the Americas. Even in the face of the advances that have occurred in the country in

terms of improved access to health services, these have not yet reached an ideal level of equity, which has resulted in health outcomes that are not always fair or acceptable (PAHO, 2012).

Although tuberculosis is preventable, curable, easily diagnosed and whose universal coverage treatment is offered by the Unified Health System, which in a way would favor access to health services, thousands of people still die in the country due to the disease (SANTOS-NETO et al., 2014).

Population agglomerations, coupled with accelerated urbanization, favor high rates of unemployment, underemployment, decreasing wage levels and poverty, to which are added poor housing and nutrition conditions. In this environment and context, tuberculosis finds favorable conditions for its dispersion. Poverty, in itself, contributes decisively to the maintenance of a general framework favorable to the spread of the disease. Pockets of poverty located in the most populous cities are fertile ground for the spread and advance of tuberculosis (PILLER, 2012).

For Barbosa et al. (2013), from the perspective of tuberculosis control, one has sought to understand the occurrence of the disease at a broad level, in which individuals and social space interact in the production of places that provide differentiated risks of getting sick, substantially changing the programming of health actions as well as their operationalization.

In this scenario, Brazil has been developing several actions aimed at reducing TB morbidity and mortality. Among them, with the objective of intensifying prevention actions and reducing TB-related illness, the maintenance of high BCG vaccination coverage and the expansion of surveillance and recommendations for investigation and treatment of latent infection by *Mycobacterium tuberculosis* stand out. Investments in the incorporation of new technologies to fight TB in the Brazilian Unified Health System (SUS) have favored the quality and effectiveness of diagnosis and treatment of the disease (BRASIL, 2020).

However, in studies such as that of Barbosa et al. (2013), the problem of tuberculosis in Brazil reflects the stage of social development of the country, in which the determinants of poverty status, poor sanitary conditions, the advent of acquired immunodeficiency syndrome (AIDS), the aging population and large migratory movements, in addition to weaknesses in the organization of the health system and management deficiencies, limit the action of prevention technology, diagnosis and treatment and, consequently, inhibit the fall of diseases marked by the social context.

When discussing TB, the orientation is to have a vision that goes beyond the characteristics of the clinic: people's living conditions must be involved, since the discussion that poverty favors TB transmission and the relationship of these people with PHC units is not recent. While TB control is considered only from the viewpoint of biomedical intervention, focused on achieving a cure, the prevalence and incidence rates will remain high in our midst (BRAGA, HERRERO, CUELLAR, 2011).

For Rocha et al. (2020), although Brazil has a comprehensive and recognized TB control program, the data obtained indicate the importance of sociodemographic characteristics in the evolution of the disease. There are several risk factors that increase the possibility of infection, passing through HIV,

smoking, malnutrition, diabetes, or other immunosuppressive diseases. The incidence of infection is also dependent on social conditions, such as quality of life, nutritional status, or hygiene (AZIMKA, 2017). Thus, it is necessary to strengthen control strategies directed at certain population groups.

It is important to emphasize that the patient's geographical proximity to health services does not mean guaranteed access to diagnosis and effective treatment. Access to health services often becomes difficult, either because of the professionals' work process, the stigma of the disease, as well as the user's resistance to seek the service (NARD et al., 2013). This can be exemplified when studying the neighborhoods in which residents move to other places to be attended and, consequently, notified (LEAL et al., 2019).

The actions that have a great impact on TB control were established by the National Tuberculosis Control Program (PNCT) and aims to decentralize these actions to the various PHC units, monitoring indicators, health education in PHC units and early diagnosis, preventing the spread of the disease (LEAL et al., 2019).

Success in the treatment of tuberculosis depends, among other factors, on the achievement of optimal therapy: appropriately chosen drugs, in correct doses and for a sufficient time (BRASIL, 2011). Based on this, it is expected that there will be neither bacterial persistence nor development of strains resistant to the drugs used. This favorable outcome of cure contributes directly to the control of tuberculosis, since the treatment of smearpositive patients is one of the main strategies to contain the infection by interrupting the transmission cycle of the disease (BRASIL, 2011).

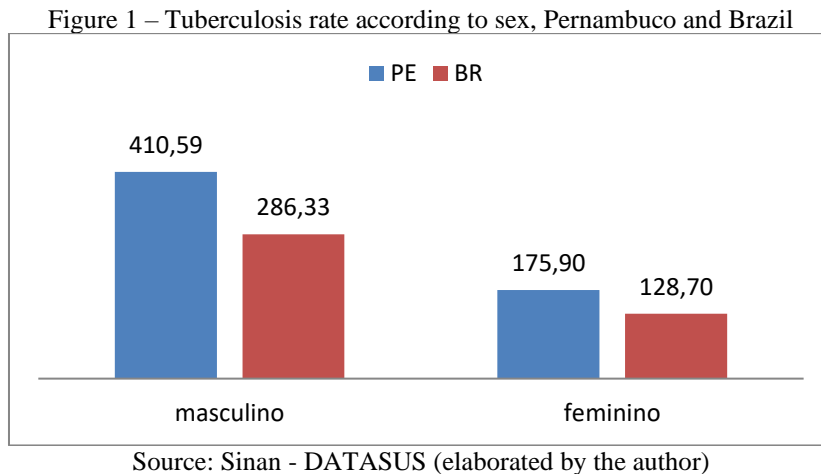
Information about contacts and the type of contact established should be listed and, whenever possible, home visits should be conducted to better understand the circumstances and invite them to the Health Unit to be evaluated and, if necessary, request tests (PROCÓPIO, HIJJAR, PORTO. 2008).

Based on the above, it is necessary to explain the vulnerability that individuals who are in contact with a case with an index of bacillus have. The chances of exposure of people to illness, resulting from aspects that are not only individual, but also collective and contextual, make them vulnerable, more susceptible to infection and illness (QUEIROZ et al., 2016). In this social layer, the proximity of coexistence due to the precarious structure of the house, lack of proper ventilation, humidity and large families propitiates contagion (PROCÓPIO, HIJJAR, PORTO. 2008).

According to Teixeira et al. (2020), advances in interrupting the chain of transmission of tuberculosis go beyond curative actions. A broader approach is essential, analyzing the sociodemographic context to the incorporation of preventive actions employed in Primary Health Care (PHC).

2.1 RESULTS AND DISCUSSION

In the gender variable, Pernambuco has 39,724 (70%) male cases and 17,018 (30%) female cases. Brazil has the same pattern, but with lower rates. Respectively, PE has 410.59 per 100,000 inhabitants and Brazil, 286.33 for males. For females, this number is 175.90 (PE) and 128.70 (BR).

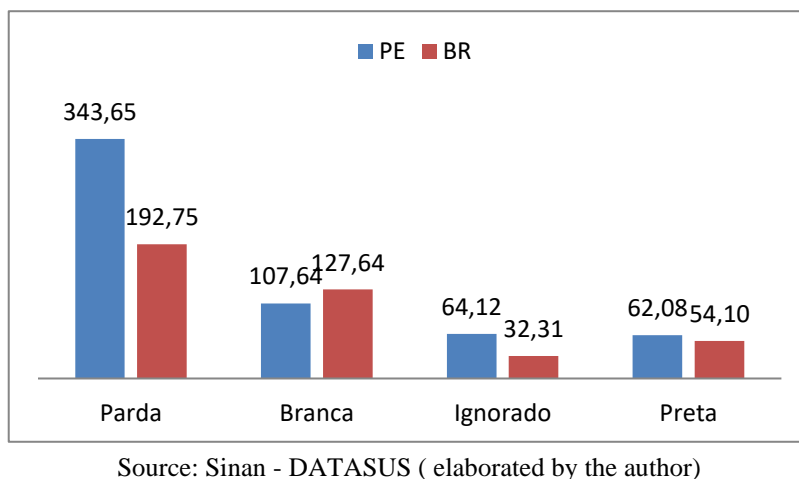


It is a disease with deep social roots (FERNANDES et al., 2020), historically maintaining a close relationship with social issues of inequity, poverty and underdevelopment (Barbosa et al., 2013). For the World Health Organization - WHO (2019), tuberculosis disproportionately affects males, young adults and low-income countries, pointing to the association between the occurrence of the disease and socioeconomic factors. The manifestation of tuberculosis is associated with poverty and its consequences, such as malnutrition and inadequate housing, and the existence of comorbidities (TAVARES et al., 2020).

In terms of race/color, Pernambuco shows that 33,247 (67%) of the cases are brown, 10,414 (21%) are white, and 6,203 (12%) had this field blank or ignored. This data differs from Brazil, where black is in 3rd place. The rates found in PE and BR were: brown 343.65 and 192.75, white 107.65 and 127.65, ignored 64.12 and 32.31. Only in the race/color white Pernambuco shows a lower rate compared to Brazil.

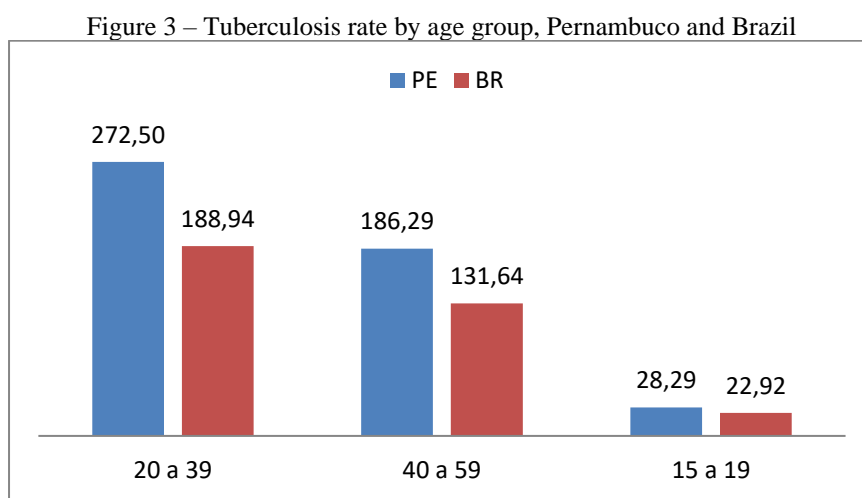
Figure 2 – Tuberculosis rate according to race/color, Pernambuco and Brazil

TRADUÇÃO:
 Parda: Brown
 Branca: White
 Ignorado: Ignored
 Preta: Black



The search for care in the referral service and the sociodemographic profile also resemble other scenarios, in which the Primary Health Care is not the first level of care sought by the user for elucidation of the diagnosis of TB that affects them, mainly men, of brown race/color, low education and economically active age (TEIXEIRA et al., 2019).

When it comes to cases by age group, Pernambuco showed 26,364 (56%) aged 20 to 39 years, 18,023 (38%) between 40 and 59 and 2,737 (06%) aged 15 to 19 years. There is a coherence with the classification of Brazil, presenting the same placements. The rates for PE and BR were 272.50 and 188.94 for ages 20 to 30, 186.29 and 131.64 for ages 40 to 59, and 28.29 and 22.92 for ages 15 to 19. The state of Pernambuco has higher rates than Brazil in all categories.



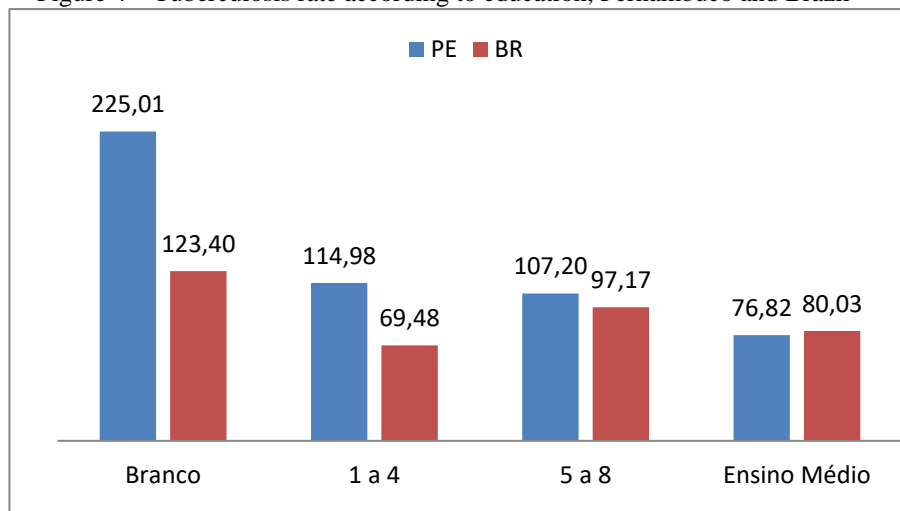
Source: Sinan - DATASUS (elaborated by the author)

The disease disproportionately affects males, young adults, and low-income countries, pointing to the association between TB occurrence and socioeconomic factors (WHO, 2019). The disease is closely linked to the socioeconomic issues of the population. The disease affects all age groups, predominantly in economically active individuals (15 to 54 years old) and males (BRASIL, 2010).

The results regarding the level of education showed that Pernambuco presents the blank category in first place with 21,769 (50%), followed by 1st to 4th grade with 11,124 (26%) and third from 5th to 8th cm 10,371 (24%) of the recorded cases. When compared, Brazil diverges in the third position, where High School is present. In relation to the rates, PE shows higher rates in all categories, with the exception of High School.

Figure 4 – Tuberculosis rate according to education, Pernambuco and Brazil

TRADUÇÃO:
 Branco: White
 1 a 4: 1 to 4
 1 a 5: 1 to 5
 Ensino
 Médio: High School



Source: Sinan - DATASUS (elaborated by the author)

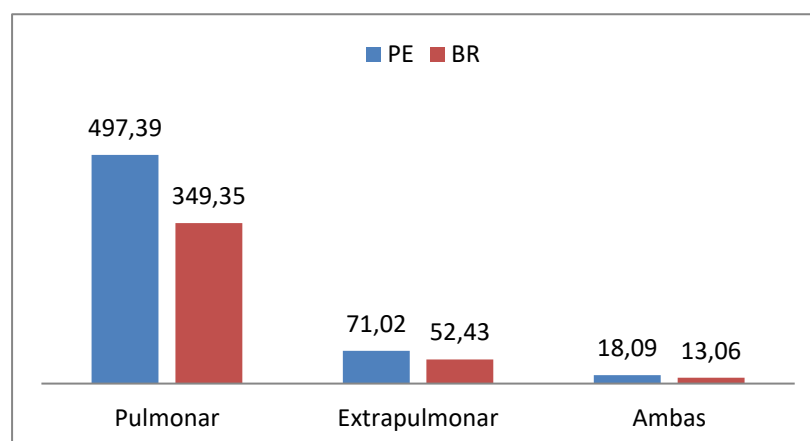
Most cases are present in males and this aspect when associated with low education level contributes to increased exposure and greater vulnerability, as it compromises access to health services, makes it difficult to face the diagnosis and adherence to treatment, either by lack of information, self-care and co-responsibility of their health condition (SAN, OLIVEIRA, 2013).

As for the clinical form of tuberculosis, Pernambuco registered 48,121 (85%) cases of the pulmonary form, 6,871 (12%) extrapulmonary and 1,750 (03%) of both forms. When compared to the national level, PE follows the same pattern of occurrence.

The rates of PE and BR are respectively: 497.39 and 349.35 for the pulmonary form, 71.02 and 52.43 for extrapulmonary, 18.09 and 13.06 for both clinical forms of the disease.

Figure 5 – Tuberculosis rate according to clinical form, Pernambuco and Brazil

TRADUÇÃO:
 Pulmonar: pulmonary
 Extrapulmonar: extra-pulmonary
 Ambas: Both



Source: Sinan - DATASUS (elaborated by the author)

According to Thronon et al. (2013), the pulmonary clinical form is the way in which TB is transmitted, as well as being the preferred location for the bacilli, since it facilitates their development due to the higher concentration of oxygen. It is the most frequent form, given its transmissibility, and is of great

importance for the early diagnosis and control of TB through adherence to treatment and assessment of contacts.

When the situation of TB case closure is analyzed, Pernambuco showed 34,072 (72%) with cure achieved, 7,078 (15%) transferred from one municipality to another, and 6,445 (13%) with treatment abandonment. Brazil differentiates its second place in relation to PE, presenting the ignored or blank field when filling out the data. The rates are all higher in Pernambuco. The values of the rates in PE and Brazil, in this order, are: cure status, 352.17 and 270.69, transfer 73.16 and 25.78, and abandonment 66.62 and 50.79.

Figure 6 – Tuberculosis rate according to closing situation, Pernambuco and Brazil

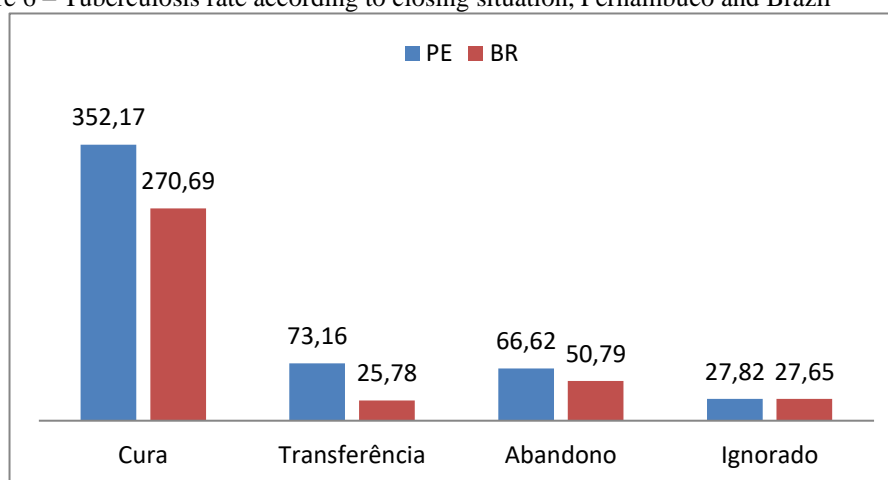
TRADUÇÃO:

Cura: Cure

Transferência: transfer

Abandono: Abandonment

Ignorado: Ignored



Source: Sinan - DATASUS (elaborated by the author)

3 CONCLUSION

This study provided the analysis of the profile of patients diagnosed with TB and notified in the SINAN system, which are similar to those found in the literature, reinforcing the importance of developing actions aimed at controlling the disease, early detection and monitoring of cases in Primary Health Care.

According to the results observed in this research, the cases of tuberculosis mostly occur in brown men, aged between 20 and 39 years, with a blank field of education (and followed by 1st to 4th grade of elementary school), presenting the pulmonary clinical form and with closure status with cure achieved. Pernambuco presents classification of variables differently from Brazil only in relation to race/color, education, and closure status.

There is an evident deficiency in the more complete filling out of the fields of some variables, as well as an increase in the number of cases in the ten years analyzed.

As a limitation of this study, we highlight the quality of the data in the information system, in which inconsistencies were identified, as well as exams "in progress", interfering with the knowledge of the profile and magnitude of the disease in the analyzed scenario. However, in order to produce data that is reliable to reality, it is necessary to train professionals to make them aware of the importance of correct registration, from data collection to data evaluation.

It is important to emphasize that in order to achieve favorable outcomes, there are recommendations for the implementation of care strategies that favor the establishment of a link and adherence in order to achieve early diagnosis and timely treatment, and consequently, prevention of drug-resistant TB..

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CHAPTER 51

Incidence of cancer among firefighters

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ABSTRACT

Firefighters are exposed to carcinogens that can increase the risk of developing various types of cancer. Many systematic reviews and articles have already been produced around the world with few conflicting conclusions. The results of several studies and analyses in Brazil, the United States, Canada, and Australia will be addressed in this article. This overview of bibliographic reviews is intended to evaluate the consistency of conclusions among the systematic reviews available on the risk of cancer in firefighters. Literature research was conducted in several indexed databases and literature available on the Internet to retrieve studies aimed at evaluating the

incidence of cancer and/or cancer mortality in firefighters. The results, among others, consistently reported a significant increase in the incidence of rectal, prostate, bladder, and testicular cancer as well as melanoma in firefighters compared to those in the general population. Results of reviews and studies suggest that various types of cancer may be more frequent in firefighters than in the general population. It is necessary to rethink models already proposed and active to institutionalize prevention programs, with the modernization of equipment and standardization of technologies, in addition to prophylactic measures that face the reduction of the development of cancer risk in professionals. After scenario analysis, preventive and mitigative measures will be sought to drastically reduce the incidence of the disease.

, abstract, abstract, abstract, abstract adjective Short short, short, small, brief, little, short, abbreviated

Keywords: Firefighters. Risk. Cancer

1 INTRODUCTION

There are numerous comprehensive reviews of recently published cancer-related literature on firefighters, along with a summary of potential carcinogens to which firefighters may be exposed. A recent study by the Industrial Injuries Advisory Council (2021) - Industrial Accident Advisory Council (IIAC), an independent scientific advisory body of the Government of England that analyses work accidents and how they are administered, found substantial evidence that firefighters could potentially be exposed to a complex mix of substances, including various carcinogens; measurements during firefighting operations may be above the work exposure limit. Heeded that many of these carcinogens are also common environmental contaminants, although generally at much lower concentrations than those experienced by firefighters.

There are a large number of published studies investigating the risk of cancer in firefighters from many countries. There is consistent evidence that mortality and incidence of cancer in firefighters are at higher risk compared to the general population. Increased risks associated with firefighting for specific types of cancer were found however, the types of cancer and the magnitude of risk estimates vary considerably between studies and between countries, the date of the study, and the time of use of firefighters in the occurrences.

2 FIREFIGHTING ACTIVITY

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The work done by firefighters differs considerably between countries and even among locations within a country. Firefighters may have to deal with many different tasks, including fighting fires in domestic buildings or industries, in vegetation, forests, and other natural environments, and on aircraft or vessels. The work can be full-time or part-time or contracted to respond to certain fires, as demanded. Some firefighters are volunteers, some professionals, and others are military. The fact is that exposures to hazardous agents differ between location and environment, regardless of the classification that can be given.

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3 ANALOGY BETWEEN STUDIES CONDUCTED IN BRAZIL AND OTHER COUNTRIES

As stated by the German news agency, Deutsche Gesetzliche Unfallversicherung Spitzenverband – DGUV (2020), by the end of October 2019, eighty-seven epidemiological studies on cancer risks in firefighters had been identified in the literature. Such studies were carried out in several ways, namely: with volunteer firefighters, military, police, female, and male, together or separately. After analyzing all studies already conducted, keeping the proportions of size and variability of each study, DGUV concluded that there is an increased risk previously demonstrated in the incidence of bladder cancer among firefighters compared to the general population. The risk of developing bladder cancer was increased by 18% and the risk of death by 72% compared to the general population. In addition, there was a 46% increase in the risk of mesothelioma. Another considered increase was kidney cancer, with a 132% increase based on three studies.

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According to the American news channel NBC News (2017), cancer is the main responsible of the death of firefighters in the United States. It also cites that the International Association of Firefighters says that cancer is currently the leading cause of death among firefighters, especially leukemia, lymphoma, or myeloma. Moreover, according to NBC, fire departments in Boston, New York, Chicago, Seattle, Los Angeles, San Francisco, Houston, Toronto, and Calgary report high cancer rates. The most aggressive cancers reported were oral, digestive, respiratory, and urinary. The researchers assure that a great reason contributing to the significant increase in rates is that firefighters today are fighting very diverse fires. Modern homes and businesses with various synthetic materials, plastics, and chemicals can explode much faster and contaminate firefighters with toxic soot

Moreira (2021) brings in his article entitled "Cancer in firefighters: the concept of protection of EPI in the long term":

"A survey conducted by the Fire Cancer Support Network, a non-profit organization based in the United States, found that cancer accounted for two out of three deaths of retired firefighters between 2002 and 2019 – and that these professionals have a 9% higher risk of being diagnosed and 14% higher of dying from cancer than the general population. The data reinforce a 2006 study by the University of Cincinnati (USA) published in the Journal of Occupational and Environmental Medicine. The survey analyzed data from 110,000 firefighters and concluded that exposure to chemicals is a threat to the health of these professionals since the profession leads to higher rates of cancer compared to the general public."

In the United States, in 2018, another study by the National Institute of Occupational Health and Safety (NIOSH) found that firefighters are significantly more likely to develop many types of cancer than the general population, largely due to the high levels of carcinogens and other toxins found in burning buildings and hazardous environments. Firefighters have a 9% higher risk of being diagnosed with cancer and a 14% higher risk of dying from cancer than the general U.S. population, according to (NIOSH). The cancers were related to the respiratory system, in addition to the oral cavity, esophagus, large intestine, and kidneys

4 FINAL CONSIDERATIONS

Made all the above exposures, it is notorious that there are a large number of published studies investigating the risk of cancer in firefighters from many countries around the globe. There is also evidence that mortality and the incidence of cancer in firefighters, considering all existing types of cancers, analyzed together, do not present such an excessive risk compared to the general population. However, it is possible to demonstrate that fire professionals have an increased risk of some types of cancer (JALILIAN et al.,

2019:p.01). It is valid to affirm that there is a greater tendency to risk contracting the disease associated with fire fighting in various types of cancer, although risk estimates vary widely between studies, in which country was conducted, date of the study, and time of employment in combat.

It is interesting to note that there are commendable initiatives related to the attempt to reduce and mitigate the problem, in addition to assisting firefighters. One notable example is the Firefighter Cancer Support Network (FCSN), which since 2005 has been a non-profit and offers individual assistance and guidance to thousands of cancer firefighters and their families. Its mission is to assist firefighters, emergency medical service providers, and their families, diagnosed with cancer, and provide support, training, and guidance to be the global leader in cancer support, awareness, and education of firefighters.

Effective education and better maintenance of equipment are essential to decrease the risk of cancer. The Lavender Ribbon Report of the National Council of Volunteer Firefighters and the Section of Volunteer and Combined Officers of the International Association of Firefighters describe some actions firefighters can take to reduce the risk of cancer.

Personal Protective Equipment (PPE) should be worn throughout the incident, including respiratory protective equipment throughout the occurrence, also in the aftermath. Measures such as immediate washing of exposed areas and removal of soot from the body (neck, face, arms, and hands) are suggested. Indications such as transporting the PPE in a plastic bag sealed and placed in an external compartment of the vehicle, thus keeping the PPE away from passengers and yourself are highly indicated. Finally, annual physical and clinical examinations are recommended, as early detection is the key to survival.

It is stressed that this article is not intended to exhaust, nor to limit such a broad subject concerning the incidence of cancer and mortality among firefighters.

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CHAPTER 52

Agroecological certifications and commercialization channels: a look under the eco-innovation shield

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ABSTRACT

With the objective of discussing the insertion of agroecological products in commercialization channels, this article links principles of eco-innovation to the production and certification of products and processes arising from family farming. It presents a new territoriality, where networks of farmers are formed and, through social organization, there is certification by peers and consequent use of seals, attesting to the quality of what is sold. In the

meantime, agroecology, participatory certification systems, eco-innovation, social innovation, networks, markets and commercialization channels are discussed. Methodologically, it is a qualitative research of a theoretical nature that seeks critical reflection on the subject. The results point to the growing problematization of the forms of appropriation, by various social actors, of agroecological knowledge through instrumental (techno-scientific) and economic rationality, conditioning the autonomy and creativity of the local socio-productive system to those logics. On the other hand, the establishment of alternative networks for joint sales, whether with the appropriation of new technologies - such as applications and/or websites, implies, above all, in changing paradigms not only in agroecology, but also on the part of consumers who adhere to a new social behavior.

Keywords: Agroecology, Family farming, Eco-innovation, Sustainable development.

1 INTRODUCTION

In order to leverage the achievement of the Sustainable Development Goals (SDGs), the Food and Agriculture Organization of the United Nations (FAO) launched the “Decade of Family Farming”, between 2019 and 2028. (UN, 2018). The relevance of world family farming is supported by FAO estimates, which indicate the predominance of this type of agricultural establishment, both in developed and developing countries, covering approximately 500 million farmers in the world. (LOWDER et al, 2016; 2014). Small and medium-sized farmers are part of this context, as well as peasants, indigenous peoples, traditional communities, fishermen and other groups representing all regions and biomes of the world. (GRISA & SABOURIN, 2019; LOWDER et al, 2016; 2014; GLIESSMAN, 2014; WYMANN VON DACH et al, 2013, MCMICHAEL, 2012).

Family farming is characterized by diversified agricultural systems, by safeguarding global agrobiodiversity, by food production and consequent maintenance of food and nutritional sovereignty. (LOWDER et al, 2014; 2016; GRISA & SABOURIN, 2019; ALTIERI & TOLEDO, 2011).

Dealing with the Brazilian reality and according to data from the 2017-2108 Agricultural Census carried out by the Brazilian Institute of Geography and Statistics (IBGE), Brazil has a total of 5,073,324 agricultural establishments, which occupy a total area of 351.289 million ha, that is, about 41% of the country's total area. Of these, approximately 77% were classified as family farming (according to the classification of Decree 9,064, of May 31, 2017), responsible for 23% of the production value and occupying an area of 80.89 million hectares. (IBGE, 2019). Given its relevance, family farming is regulated in Brazil through Law 11,326, of July 24, 2006, which establishes guidelines for the formulation of the National Policy on Family Agriculture and Rural Family Enterprises.

Schneider (2016) warns of the conceptual controversies surrounding the definition of the term “family farming”, often used as a synonym for “small production” and “peasantry”. Family farming is a productive activity, while small production refers to the scale of production.

Family farming is a productive activity that takes into account a traditional (or substantive) rationality that goes beyond economic logic, in this sense, local institutions based on a peasant logic tend to affect it, in different expressions.¹

A large part of these farmers characterized as family members practice agroecology not only as a productive system, but as a philosophy of life, which considers the land as a sacred patrimony, they use practices of water preservation, reduction of the use of chemical products, rescue of knowledge and ways of traditional cultivation, sustainable development of the territory, solidarity economy and safeguarding agrobiodiversity. (ALTIERI, 1989A, 1989B, 2002, 2012; WANDERLEY, 2014; 2009, 1999; WOORTMANN, 1990) Agroecology has also been treated with a multidimensional approach covering social, political, economic and environmental aspects (ALTIERI et al, 2021; WEZEL et al. al, 2009; CAPORAL & COSTABEBER, 2002). It is identified as an alternative to overcome world food insecurity, safeguard biocultural heritage, improve production, add value to products and promote local development (ALTIERI & NICHOLLS, 2020; NICHOLLS & ALTIERI, 2018; TOMICH et al., 2011; FLORIANI; FLORIANI, 2010)

However, the products coming from these small properties, usually agroecological, face difficulties with the flow of production, given the high competitiveness and competition, and access to commercialization channels is unfeasible due to high costs and requirements for standardization and standardization of products. One of the alternatives to improve the income of producers, add value to

¹ Far from presenting the state of the art on the scientific paradigms about the peasant question, whether they are more materialist or cultural, we highlight some authors who have contributed to the reflections of what peasants are in modernity and the process of re-peasantization in the face of the process of globalization of the capitalist mode of production, especially in rural Latin America. Each author, although focusing more on the economic, or organizational or symbolic dimensions, seeks to address the issue by establishing connections between the categories identity, territory, work and way of life, and their forms of resistance and constant search for autonomy (CHAYANOV, 1981; CANDIDO), 1964; SAHLINS, 1979; IANNI, 1986; WOORTMANN, 1995, DIEGUES, 1996; WANDERLEY, 1999, ESCOBAR, 1999; TOLEDO; BARRERABASSOLS, 2000; BRANDENBURG, 1999; CARMO, 1998; SABOURIN, 2009; PLOEG, BRANDÃO; LEAL, 2012; RAFFLES, 2002; BARRERA-BASSOLS and FLORIANI, 2016, among others).

products, guarantee access to buyer markets , whether institutional or for direct sale and promotion of sustainable development, is social organization, through networks and associations.

Brazil is a pioneer in institutionalizing the production of organic and agroecological products. In this sense, Law no. 10,831 of 2003 and Decree no. 6,323 of 2007 that regulate the production, storage, labeling, transport, certification, marketing and inspection of products. In addition, there is also a wide range of normative instructions, ordinances and resolutions that establish technical norms and procedures that govern the matter.

The objective of so much regulation is to provide instruments of control, transparency and traceability for consumers who opt for organic and agroecological products. It is, therefore, a guarantee of quality. We believe that legislation on the procedures that govern the production of agroecological products is necessary, from the point of view of establishing certain control standards. However, in practice, adapting to what is recommended in the legal-bureaucratic framework has been limiting, imposing and excluding, limiting the creative and innovative potential of family farming. (FLORIANI et al, 2022; GIRALDO & ROSSET, 2018)

Agroecological certification initiatives maintained by public institutions or implemented by associations and cooperatives persist equally imposing and excluding protocols, demanding that farmers adapt to standards that promote the deterritorialization of practices and traditions that translate into territorial and cultural goods. Furthermore, it can be seen that the extensive and complex legislation has represented obstacles not only to certification, but also to the insertion of agroecological products in distribution channels.

Still from the perspective of agroecological certification, the proposal is the development of protocols that cover the legislation, but at the same time allow flexibility in favor of the traditional practices adopted that translate into cultural and local goods. The development of such humanized protocols involves social organization and certifications would be the result of control exercised by peers, formally organized through associations and/or cooperatives.

Once organized collectively, it is possible to define certification strategies, as the extensive legislation recommends, with seals that identify a certain territory, reflecting its characteristics and cultural heritage. Within this context, eco -innovation is inserted as a tool for adding value (BERTHET et al., 2016; EL BILALI, 2019; IYABANO et al., 2021; PEÑA-TORRES; REINA-ROZO, 2022; SILVA; ISSBERNER; BRAGA, 2021).

Based on the study developed by Shumpetter , innovation is understood as a process that results from complex interactions at local, national and global levels between individuals, firms and other organizations focused on the search for technological capability. (PORDEUS & STROPARO, 2021; PRZYBYCZEWSKI; STROPARO . 2021).

We cite the work of Dosi (1988), who uses Thomas Kuhn's notion of a scientific paradigm to understand the development of technology, relies on an analogy between science and technology, and cites

innovation as a problem-solving and developmental activity. specific procedures for solving these problems, characterizing it as the search, discovery, experimentation, development, imitation and adoption of new products, processes and new organizational techniques. (PORDEUS & STROPARO, 2021; PRZYBYCZEWSKI; STROPARO, 2021).

Innovation can incorporate other dimensions and move towards environmental and social dimensions, for example. In the environmental issue, there is eco -innovation that goes beyond the themes of diagnosis, pollution prevention, reduction of environmental liabilities and environmental impact, with most concepts incorporating the reduction of environmental effects (KOELLER ET AL., 2020; PINSKY ET AL., 2015; SCHIEDERIG ET AL., 2012).

According to Maçaneiro & Cunha (2015) eco -innovation , therefore, is an innovation that results in a reduction in environmental impact, whether these impacts are intentional or not, thus being a way of sustainable innovation. The interfaces between eco -innovation and agroecology are perceptible as the latter is characterized by the adoption of sustainable, albeit traditional, practices.

Innovation focused on sustainability, or eco -innovation , can be considered as the introduction of new or significantly improved products, production processes, management or business methods for the organization and that bring economic, social and environmental benefits, compared to relevant alternatives. It is not just about reducing negative impacts, but adding net benefits (MAÇANEIRO & CUNHA, 2015).

In the midst of discussions about innovations, eco -innovations and the relationship with agroecology and participatory certification systems, the link with social innovation emerges, in the sense of proposing a new productive and process rationality. A rationality that escapes the imposing and inflexible processes, legally constituted or by protocols agreed by established organizations. (BERTHET et al., 2016; EL BILALI, 2019; IYABANO et al., 2021; PEÑA-TORRES; REINA-ROZO, 2022; SILVA; ISSBERNER; BRAGA, 2021).

We share the idea that agroecological certifications can be a form of eco -innovation because, in theory, they are vectors for adding value to products and processes, as they enable the creation of networks and the safeguarding of knowledge and practices.

Family farmers, agroecological, whose products are certified with quality assurance, adept at eco -innovative and social practices, have greater possibility of access to commercialization channels, whether through fairs, supply of baskets, organization of communities that support agriculture (CSA - *Community Supported Agriculture*) as well as institutional programs such as the Food Acquisition Program (PAA - replaced by the Alimento Brasil Program) and the National School Feeding Program (PNAE)

In this way, the objective is presented, which consists of discussing the insertion of agroecological products in commercialization channels, linking principles of eco -innovation to the production and certification of items arising from family farming. The justification for the possession of eco -innovative tools by agroecology, notably in terms of adding value and access to more competitive markets, is based on the principles of agroecology itself, which encourages the autonomy of farmers in the market and the

consequent appreciation of agrobiodiversity . . (ALTIERI, 2012; ALTIERI & TOLEDO 2011 FLORIANI and FLORIANI, 2020), and the diversification strategy is recognized as one of the means that provides the sustainability of a property in rural areas. (PLOEG et al., 2019; ALTIERI, 1989b).

The methodology is characterized as qualitative research, with a bibliographic approach and documental procedure. In this way, searches were carried out in international journals such as *Esmerald Insight* , *Science Direct*, *Scopus* and *Web of Science*, using the terms “ Agroecology ”, “ Innovation ” and “ Distribution ”. channels ”. Duplicate items were excluded from the research portfolio; articles published in scientific events; texts exclusively focused on the business area and/or with a general focus; without specifying agroecological products in the research object and studies that do not deal with eco -innovation directed to distribution channels or agroecology.

2 DEVELOPMENT

2.1 SUSTAINABILITY, AGROECOLOGY, NETWORKS AND INNOVATION: MEANINGS AND REPERCUSSIONS

Sustainable development was defined by the Brundtland Commission (WCED, 1987) as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Other definitions have emerged over time and although the concept is widespread and accepted in academic circles, it is vague and subjective in terms of practical ways to achieve the proposed objectives. (CAPORAL E COSTABEBER, 2002; LICHTFOUSE et al., 2009) . In common, among the numerous definitions of sustainable development, the central point is the duty to satisfy the needs of the present generation without compromising the needs of future generations. In other words, the long-term vision and actions to safeguard material and immaterial (biocultural) heritage must prevail. (DALE et al., 2020; LICHTFOUSE et al., 2009; ALTIERI 1989A;1993; CAPORAL E COSTABEBER, 2002)

Dealing specifically with family farming, we adopt the approach of Caporal and Costabeber (2002) who assert: “(...) strategies aimed at promoting sustainable agriculture and rural development must take into account six related dimensions, namely: ecological, economic, social, cultural, political and ethical”. Thus, the concept of sustainability is one of the pillars on which agroecology is based, and can even be used as an indicator of activity in transition processes (CAPORAL AND COSTABEBER, 2002).

Thus, discussing sustainability in the light of family farming, specifically agroecology, implies considering multidimensionality as an implicit factor not only in terms of regional and local characteristics, but above all with respect to ancestral practices, defining the cultural identity of the different social groups that constitute territorialities .

We believe that it is not possible to deal with sustainable development without considering the ecological, economic, social, cultural, political and ethical dimensions, although it is not the objective of this work to discuss each of them in detail. At the same time, Sachs (2004) considers the following

dimensions: social, political, economic, environmental and territorial, the latter being related to the spatial distribution of resources, populations and activities.

In the scope of this work, the terms and dimensions are related and integrated in a symbiotic way, as the defense of territorialities and the fight against hegemonic processes of monocultural production are defended. It is understood that the social organization and the certification of agroecological products are sustainable alternatives for small properties that will be able to access marketing and distribution channels, using an eco-innovative tool for the promotion and dissemination of what is produced.

Innovation focused on sustainability, or eco-innovation, can be considered as the introduction of new or significantly improved products, production processes, management or business methods for the organization and that bring economic, social and environmental benefits, compared to relevant alternatives. It is not just about reducing negative impacts, but adding net benefits (MAÇANEIRO & CUNHA, 2015).

Furthermore, leaving the field of abstraction and thinking about the concrete reality and the difficulties related to the theme, the central point is the reflection of the meanings and repercussions arising from the adoption of eco-engagement tools in such a way that they guarantee to the farmers processes within the principles agroecology itself, that is, are economically viable, environmentally safe and socially just. In this way, the aim is to restore local self-sufficiency, the conservation and regeneration of agrobiodiversity of natural resources, the production of healthy foods with low inputs and the empowerment of peasant organizations (ALTIERI; TOLEDO, 2011)

Ploeg and Marsden (2008), when discussing rural development, discuss it from two perspectives: one that understands development as something that is being built from local experiences and another that encompasses social processes of inclusion, participation and income generation. In this study, there was the proposal of the so-called Rural Web, which aims to understand the interconnections between people from different locations around agriculture. Networks are fabrics that make it possible to study the relational structure in which individuals or organizations are inserted and that emerge as a new instrument in the face of determinisms to existing social groups, new arrangements and demands. (PLOEG, MARSDEN, 2008; MARTELETO, 2001).

In line with the above, networks are groups formed from common interests, with relations of respect and reciprocity, despite individual differences, collective interests overlap. It is noticed, in the debates involving the term development, different concepts and approaches to deal with the intrinsic relationships existing between sustainability, networks, autonomy and local organizations. In these terms, freedoms are not just the primary end of development. The promotion of political freedoms (governance and bottom-up decision-making processes), social opportunities (in the form of socio-environmental education and health), and public-private economic devices, are synergistic processes aimed at social (equity), ecological (sustainability) and economic (growth) of development (SEN, 2010).

Latour (2007), deepens the discussion by proposing the Actor-Network *Theory* (ANT) deals with the perception of space as an analytical dimension, enabling new re-readings of the relationships that are

established, even enabling the construction of collectives including human and non-human and establishing new paradigms. (FLORIANI et al, 2022)

Networks are, therefore, constitutive of political spaces and, for the scope of this work, when discussing whether alternative agri-food networks such as CSA, for example, there is, in addition to the aspects of connections for common interests, the struggle for healthy foods, for safeguarding agrobiodiversity, by ancestral cultural traditions and knowledge and represents an act of subversion to the dominant model of markets and profits. In this way, it is verified that the social actors constitute a web of interdependencies that constitute space and territorialities.

Finally, it appears that the issues dialogue and, as a political action, it is up to agroecological farmers to appropriate the available technological tools, as a way of reaching new markets and consumers and as a guarantee of adding value to what is produced.

2.2 PARTICIPATORY GUARANTEE SYSTEMS (SPG), SOCIAL CONTROL, AGROECOLOGICAL CERTIFICATIONS AND DISTRIBUTION CHANNELS

The conformity assessment of organic products was instituted in Brazil with the enactment of Law n. 10,831 of 2003 and Decree no. 6,323 of 2007 that regulate the production, storage, labeling, transport, certification, marketing and inspection of organic products in Brazil. In addition to the legal instruments mentioned above, there is a range of normative instructions, ordinances and resolutions that establish technical standards and procedures. (BRAZIL, 2003; 2007).

The enactment of Law 10,831/2003 formalized the Brazilian Organic Conformity Assessment System (SisOrg) which has three modalities for certification: i) certification by auditing; ii) participatory conformity assessment bodies (OPAC) and iii) Social Control Body (OCS). There are, therefore, the Conformity Assessment Bodies (OAC) constituted by audit certification or Participatory Assurance Systems (SPG) covering OPAC and OCS. The latter establishes Social Control for direct sales (without certification).

Certification by auditing consists of hiring public or private auditing companies, regularly registered with the Ministry of Agriculture, Livestock and Supply (MAPA). The criteria for certification are defined by international regulations and standards suited to Brazilian legislation and consist of inspections of properties aimed at verifying production processes. This modality is unfeasible for small family producers because it incurs high costs of contracting and adaptation.

Participatory Guarantee System (SPG): This is a collective organization that is responsible for certification. They are usually groups of producers, consumers, technicians and other interested parties, and there is a need to establish and formalize a Participatory Conformity Assessment Body (OPAC) that will be responsible for issuing a seal via the Brazilian Organic Conformity Assessment System (SisOrg), as well as controlling of production processes. It is a legal entity with attributions and responsibilities regulated by MAPA and, due to the administrative structure and inherent bureaucratic obligations not only for

constitution and formalization, but for operationalization, it also presents high costs and broad and rigid protocols.

On the other hand, the third way to obtain accreditation and conformity assessment, which allows direct sales, is through the constitution of a Social Control Organization (OCS) . It is a group, association, cooperative or consortium of family farmers, with or without legal personality, which establishes the processes and inspects the documentation produced internally, in each of the properties and issues the Registration Declaration, which proves its production of agroecological and/or organic basis. Quality assurance, in this case, is the responsibility of the group responsible for social control.

Among the possible ways of obtaining the conformity assessment, the one obtained through OCS stands out for the simplification of the assessment processes and reduction of implementation costs, since social control is carried out by the peers that make up the nucleus. The conformity of processes and products is attested after visiting and verifying the items object of analysis and identification of inconsistencies and non-conforming items, as well as adaptability to specificities, and there may be seals that identify territorialities and territories .

Constituting an OCS is, therefore, one of the ways provided by law to strengthen existing family farming, with the implementation of agroecological practices that add value to the products and consequent creation of a certifying seal that enables product traceability and quality assurance. Furthermore, it should be noted that the creation of a certifying seal supersedes legal issues and technical procedures, but must consider variables such as respect for traditions, beliefs, methods and acceptance by the farmers involved, completely discarding any imposing methodology and/or that significantly alters the way production and processes already consolidated.

Even opting for the modality of social control for direct sales, in a simpler theory, it appears that the three modalities provided for by law are wrapped in a wide range of complex and excluding protocols, making it extremely difficult for small family farmers to participate.

Research pointing out such difficulties and dichotomy between the ideal and the real find that although there is an increase in the number of certified farmers, it is noticed that there is a tendency to keep only in the reach of the minimum objectives, without the interest in the implementation of complex agrifood systems and the justification has been the impositions arising from the introduction of extensive and costly manuals and forms. It questions whether, even, the excessive concentration on evaluation routines as a demotivating factor for the transition from conventional to agroecological agriculture. (NIEDERLE et al., 2022).

In addition to problems with certifications and sales, agroecological farmers face problems with the competitiveness of their products and, as they are perishable, with timely disposal. Solutions have been presented to overcome the problems arising from supply and demand, trying to establish sales schedules, either through street markets, weekly or fortnightly baskets for pre-determined consumers, as well as the so-called Communities that Sustain Agriculture (*Communnity*). *supported Agriculture*), or simply CSA.

CSA is a movement that aims to encourage the consumption of local products and the sustainability of local food systems (Henderson; Van En , 2007; Lamb, 1994;) where consumers are considered co-producers and purchase an expected harvest, every six months or year, of agroecological farmers, paying monthly or fortnightly a predetermined amount of money. On the other hand, they receive baskets with various products, which can be vegetables, fruits, vegetables and other items produced on the property.

The central objectives of the CSA are: i) stimulating the consumption of locally produced food; ii) establishment of direct links between producers and consumers; iii) revitalization of production, transformation and distribution structures; iv) building networks of relationships between producers and local governments, entrepreneurs and other leaders; and v) promotion of the local economy and rural development. (KOLODINSKY, PELCH 1997; LANG, 2010; LAGANE, 2015).

At the same time, producers are encouraged to participate in other sales modalities, such as using sales platforms hosted on websites or applications developed for this purpose.

3 CONCLUSIONS

This article seeks to discuss theoretically the insertion of agroecological products in marketing channels, linking the principles of eco -innovation to production and certification. The need to provide sustainable development where natural resources are used within an ethical and preservation rationality, linking income generation policies and improving the quality of life of small farmers is urgent under penalty of deterritorialization of an entire cultural and cultural heritage. agrobiodiversity present.

Among the alternatives for adding value and access to markets, there is the certification of products and processes, through social control exercised by peers, which makes it possible to provide tools that translate into transparency and traceability for consumers, restoring relationships of trust and proximity.

However, certifying products and processes, even in a less bureaucratic way - via the constitution of OCS - implies overcoming highly complex obstacles and constraints related to extensive legislation that imposes time-consuming, exhaustive and often limiting standards and procedures.

The solution that presents itself to face the obstacles is to build networks and work on collective solutions where farmer associations (OCS) play the role of agglutinating, inspecting and certifying products and processes in accordance with and in line with the territorialities and traditional practices of a population whose foundation is the safeguarding of the present biocultural heritage .

Certifications and seals are, therefore, instruments of validation and accreditation that the product offered was produced within certain ecological, ethical, social and economic precepts that encompass the multidimensional dimensions of agroecology itself, giving them protagonism and socio-environmental awareness. .

Within this context are the eco -innovation tools that cover all stages of production, certification, marketing and logistics channels. Dealing specifically with commercialization channels, there is the

possibility of sales at street markets, supply of baskets, participation in programs such as CSA and institutional notices such as supplying food for school lunches.

We understand that access to these markets necessarily involves the disclosure of available items, publicizing not only the items themselves, but setting up a pool of information that allows the necessary transparency of the production process, the sanitary techniques used and other pertinent information in such a way that consumers and farmers and serve as an incentive to consume local, agroecological, in natura or agroindustrialized products . To this end, the use of apps or websites for sale means a paradigm shift not only in agroecology that appropriates new technologies, but also on the part of consumers who adhere to a new social behavior of valuing local and healthy products.

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CHAPTER 53

Ecomuseum of the Quilombola Community of São Pedro de Cima

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ABSTRACT

The ECOMUSEU project of the Quilombola Community of São Pedro de Cima was designed and organized as a university extension project with professors and students of the Geography course at the Federal University of Juiz de Fora. The starting point of this project arises from a field work carried out in

2007 in the discipline of Agrarian Geography, from then on, a web is built with the community and it started to present demands that gave rise to this extension project. The quilombola community of São Pedro de Cima is an extremely rich geographical sociocultural reality, and this reality is one of the reasons for carrying out this extension work. The project has its relevance for providing the interrelation between the different actors of the local community and with the institutions present, in particular the public school. Therefore, this work aims to contribute to discussions mainly economic and sociocultural about the Brazilian agrarian processes that were responsible for the emergence of excluded territories and that today interact with the agro-export model fostered by Brazilian policy.

Keywords: Rural Geography, Quilombola Community, Territoriality, Environmental Education, Heritage Education.

1 INTRODUCTION

During the Brazilian historical process, there were several struggles for land ownership and for improvements in working conditions. For this reason, several resistance movements emerged that fought for their affirmation in space. Within these movements we can consider the quilombola MOVEMENTS, which were represented by slaves who fled the farms in search of a better quality of life. Most of the time, they were installed in places of difficult access, to make it difficult for the overseers to hunt these slaves who fled the farms.

The Quilombola community of São Pedro de Cima still does not have a defined history of its beginnings, but we can say that it was first occupied by a family of black slaves who “went up” to higher lands in order to constitute a new territory. This was characterized by a black community that was called by local residents as São Pedro dos Crioulos. With its traditions and customs, and after a migration process and with the arrival of new subjects, this community undergoes transformations with the insertion of new cultures by constituting itself as a space of agricultural production, incorporating other traditions, thus occurring a cultural miscegenation.

The community was founded in what is now called São Pedro de Baixo, but due to the articulation and pressure of farmers at the time, the slaves moved to a more distant region, where today is São Pedro de

Cima. During this period, the process of territorialization of the community takes place. The community was formed and commanded by a black gentleman by the name of Pedro Malaquias, who occupied the place with his family, giving rise to the village.

According to reports from local residents, the community when it started went through numerous difficulties, such as difficult access to places and, mainly, to practice agriculture, which caused other critical situations such as hunger and poverty in general.

The situation of isolation and/or refuge, like all quilombos, meant that black families were in fact isolated, subsisting to this day rural workers who deal with the land as a legacy of these times and the only source of income and survival. This situation contributed to the emergence of the collectivity, creating an intense community life with gardens and collective creations serving the entire community and the reproduction of a social and cultural life guided by the residents themselves.

Over time, this built tradition has been changing according to the advancement of the economic system and the intensification of relations with the city. With the expansion of new residents who arrived in the locality, mainly in the second half of the 20th century, the community has been changing in an intense way. The migratory process begins and becomes the main factor of transformation.

During this period, other families began to acquire land in São Pedro de Cima. The acquisition of land by new families was an intriguing factor in our work in the community, based on reports from local residents with varied testimonies and justifications. As the community was a space for runaway ex-slaves, they did not have legal ownership of the land. Among the main reasons given to the group through interviews, is the figure of Pedro Malaquias, until then founder of the community, who in turn begins the process of selling land. However, other interviewees from the community itself said that the occupation of the community by new families took place in a violent way. It is important to emphasize that the new families that enter the community are non-blacks from the region. The process of community occupation according to local residents makes up a cast of several stories, which, when trying to bring them all together, leads to an understanding of the spatial organization relations and structuring of power in the place.

With the entry of new members into the community, the way of dealing with the land was gradually privatized. But these new farmers who entered the community also had the desire to cultivate the land for survival. It is from there that traditions and customs begin to be changed. Before, families were predominantly black and marriages often took place between family members. With the entry of new members, families were mixing and mixing beliefs and customs. Catholicism is present in a deeper way and when it comes to culture and belief, the introduction of the evangelical religion later came to contribute to yet another influence on the sociocultural framework of the population.

Starting in the 1980s, programs to encourage coffee production made the community more complex in terms of its social and economic organization. It is at this moment that the transformation of the territory takes place with greater intensity, because with the cultivation of coffee, the network of relationships

between producers and workers was gradually expanded, as well as the planting and commercialization of coffee also brought the possibility of more intense relationships. with neighboring municipalities.

From then on, all people in the community plant coffee, being the flagship of the local economy and families. Over the years, the landscape is increasingly taken over by coffee plantations, with crops created mostly by family members, reinforcing the idea of family farming.

The Brazilian rural environment today is experiencing dilemmas and impasses that go through issues of the past, which have had consequences today and which concern all Brazilians. These issues are crossed by different projects for the countryside, divergent views on rural development and territorialities that attribute different, even confrontational, meanings to rural territories.

Located in the Zona da Mata Mineira region (southeast of the state, bordering the states of Rio de Janeiro and Espírito Santo), micro-region of Muriaé, between Serra do Caparaó and Serra do Brigadeiro and having as main access roads to BR- 116 and MG-265, is the municipality of Divino, bordering (among others) the municipalities of São João do Manhuaçu, Orizânia, Espera Feliz, Caparaó and Carangola, where the community characterized as a rural area of the municipality is located.



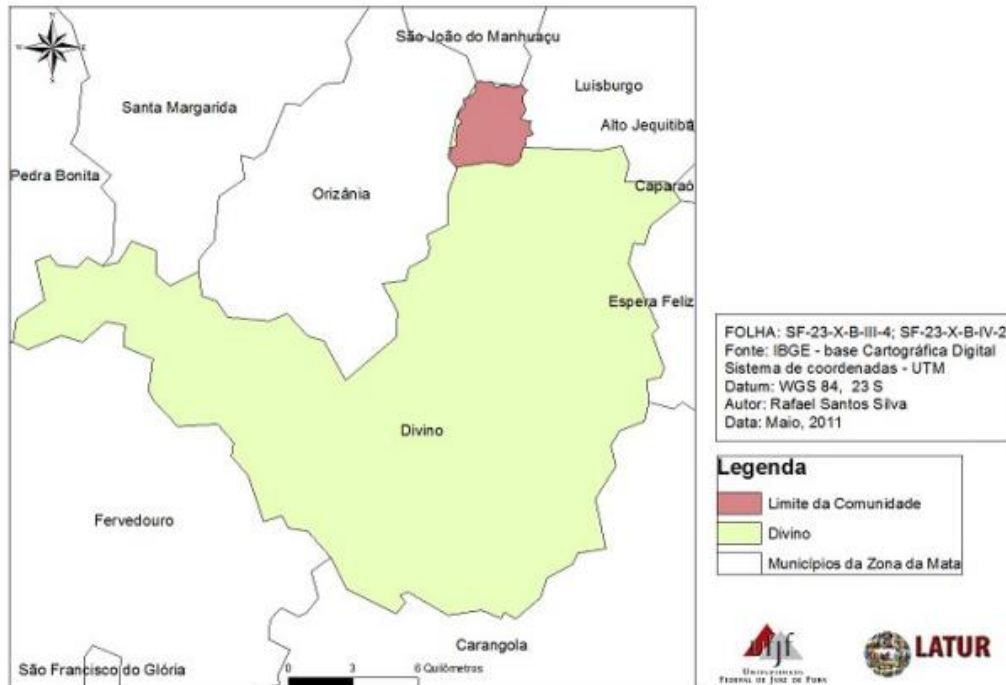
According to DANTAS (2011), São Pedro de Cima currently has approximately 130 families and 500 inhabitants who, according to MENEZES (2008), spread out on the slopes of the upper and middle valleys of the São Pedro River at altitudes ranging between 900 and 1200 meters.

Also according to MENEZES (2008):

“In São Pedro de Cima, there remains a generation of rural workers from the times when accessibility to the region was precarious, which determined a certain isolation of the black families who lived there. This situation, in turn, created an intense community life that, although semi-isolated, was able to maintain itself, thanks to joint work and the reproduction

of a social and cultural life guided by the residents themselves. There is still a strong influence of popular Catholic rites mixed with healing and blessing practices of Afro-Brazilian and indigenous origins, and some festivals and celebrations that mark the Catholic religious calendar are still preserved today” (Menezes, 2008)

Localização da Comunidade no município de Divino, MG



The access to the community takes place mainly through two accesses, which can be considered the main ones: through the municipality of Divino, with a distance of approximately 20 km and through the BR 116, at the height of Orizânia, which is approximately 7 km from São Pedro de Cima.

The community also has relationships with nearby municipalities such as Luisburgo, São João do Manhuaçu, Orizânia, Carangola and even Muriaé. However, the seat of the municipality of Divino is configured as the main service center for the residents of the community.

São Pedro de Cima's main economic activity is family farming and is the main source of income for the community, with each family organizing their production, but also intercropping plantations. The common plantations are coffee, corn, sugarcane and beans, and there are also vegetable gardens in the backyards of each house. In addition to consumption, coffee is produced for sale, being the flagship of agriculture in the community.

We cannot fail to mention the entry of a private ore pipeline, which cuts through the community. This project had a strong impact on the community, since it dispossessed several families and also ended up with the floodplain areas destined for rice plantations.

However, what makes the community an object of study is the recognition by the Palmares foundation as a quilombola remnant on July 28, 2006, the date of publication in the official journal of the Union.

According to CARNEIRO 2008:

“The movement that took place around this process of recognition of territoriality brings conflicts and questions about the existing social composition, due to the presence of several other subjects in this community attracted by the planting of coffee in new lands from the 1970s, with their respective techniques and cultures, including the new religious contexts that purged the healing and magic practices of the original black community. Today, this community relaxes, aiming for the titling of their lands, even demanding the return of the name “São Pedro dos Crioulos” to the community” (Carneiro, 2008)

The São Pedro de Cima Quilombola Community Ecomuseum extension project emerged from the opportunity in 2007, when fieldwork was carried out in the discipline of Agrarian Geography in the Geography course at the Federal University of Juiz de Fora. This visit was the first contact with the community where questionnaires were applied in order to carry out a qualitative and quantitative study of the community in question. This work served as the basis for a second fieldwork of the discipline, this time in another class, where new questions to be addressed emerged.

Therefore, the present project arises from the verification of the existence of problems and/or needs of the community, on the part of students and teachers, together with demands identified and presented by some members of the community itself.

Working in the community of São Pedro de Cima has a special meaning for the group, as it is an opportunity to exchange knowledge and knowledge for the progress of the project.

It is worth mentioning here that the project comes for its third approval. The first was in the 2008 public notice, with the approval of the project by the Ministry of Culture to be carried out during 2009. The second approval was in the 2010 public notice, which was approved by the Ministry of Education with activities for be carried out in the current year of 2011. The third time that the project was contemplated was in the 2011 notice from the Ministry of Education, for activities to be carried out during the year 2012.

The project initially aimed to collect socio-geographical information and sought to consolidate partnerships in the community to help with research activities. In doing so, it managed to consolidate itself and attracted several members of the community as important and strategic collaborators in the development of the community project.

The project also aims to sensitize the community to the issue of environmental and cultural heritage. This effort is necessary for the residents to see themselves as producers of space, in addition, it is intended to recover an identity put aside with the entry of the urban way of life in the community.

For this, the geoprocessing tool is being used with the objective of mapping and mapping the region and the entire community. This procedure aims to understand the identity and local geography from the forms of representation of space. This work is also being carried out as far as possible in parallel with the environmental diagnosis. This stage is certainly the most laborious of the project, as it simultaneously needs to organize the environmental and cultural database.

As final products of the research, based on the data obtained, the consolidation and recovery of community knowledge is being continuously carried out, materialized in proposals for the annual realization of the cultural agenda, the installation of an ECOMUSEU, the creation of a geographic-cultural Atlas of the community, the booklet and the strengthening of the residents' association, as well as the Avura black movement. It is intended to install a permanent forum for discussions of the main problems related to the community and its environment.

2 OBJECTIVES

The ECOMUSEU project of the Quilombola Community of São Pedro de Cima, as it is still in progress, has as its main objective to build an environmental education program with the community to consolidate management practices within the agroecology system and the characteristics of the local peasantry; Build dialogue and action practices for the construction and consolidation of community identity, through the inventory of local, tangible and intangible heritage and the dissemination and apprehension of heritage education; Creation of an ECOMUSEUM and production of the Geographical Cultural Atlas and the Booklet, with the proposal to register, represent, stimulate and promote the cultural development of the region.

This would aim to:

- Diagnose and map the environmental problems experienced by the community, based on consolidated collective knowledge and the counterpart of identifying the unknown effects caused by the action of new technologies and the variety of impacts on the community's life space.
- Foster the exchange of knowledge between the University and the Community of São Pedro de Cima, through the collective construction of a political pedagogical project.
- Disseminate and clarify topics related to situations and phenomena present in everyday life such as: environmental impacts, agroecology practices, banking and financial relationships, production cost, rights and duties of citizens, etc.
- Shared proposition of environmental education and heritage education actions.
- Promoting awareness of environmental preservation, relating it to the local reality, as a large part of the territory is in APA (Environmental Preservation Area) and considering, above all, land / soil as the main source of income for the population.
- Georeference and produce a local thematic cartography as a database and knowledge of the geographic reality of the lived space.
- Study and propose solutions to the problems identified, considering the local context.
- Awakening awareness of its own representation, so that the community can develop its own social, political and, if possible, economic autonomy.
- Consolidate action to preserve and rescue the territorial and cultural heritage of the São Pedro de Cima region and the quilombola community.

3 METHODOLOGY

The main application of the methodology of this project is made in the field applying the principles of university extension. It is the first step to evaluate, analyze and tabulate data on the demands presented by the community of São Pedro de Cima. The methodology of this project can be divided into two stages and several moments that are divided into the work of part of the concentration of activities that are carried out at the Laboratory of Urban Territorialities (LATUR-UFJF), always according to the demand of the community and products from the universe present in the community itself. As products of the research, a first edition of a booklet and a cultural geographic atlas about São Pedro de Cima were prepared.

During the first stage, fundamental activities are carried out to represent the local geographic space, such as: georeferencing the community's territory and collecting socioeconomic data. *Pari passu*, reading groups were held in an attempt to establish a theoretical framework, together with weekly meetings of the extension group for the successive construction of activity plans for the actions that will be carried out in the field. Among the various activities that have already been carried out and continue to be carried out with different demands, we can mention:

- Meeting with community representatives, school members (Secretary of Education, school management, teachers and students, Movimento Negro AVURA and the Municipality of Divino);
- Application of socioeconomic questionnaires;
- During all field trips, part of georeferencing is carried out: eucalyptus, coffee (plantations in general), in addition to the pipeline, water resources, etc.;
- Dialogue and detection of the most varied demands that arise in the community over time;
- Audiovisual documentation;
- Photographic records;

This project is already in its third approval with funding agencies, so new activities and more demands arise from the community.

- Preparation of the second volume of the booklet that will address a topic taken together with the research group and the school (students) that will help to prepare it.
- Production of the second volume of the cultural geographic atlas.
- Mapping of the community area that is used for coffee plantations, among other agricultural activities.

- Presentation of the family tree of the community. The aim of the booklet and Atlas products are aimed at the community, where they will be used after training workshops for teachers in the community. Thus, these products can be used in the classroom of the community's own school, presenting the community to the community and being able to be worked on in an interdisciplinary way, since both the booklet and the Atlas will address cross-cutting themes.

Emphasizing the discussion on the importance of the material and immaterial goods of the community. We will also resort to works on the community that have already been carried out by UFJF

students trying to systematize them. The structure of the meetings (field work) will be defined based on the results of research in the community (Cf. Menezes, 2008). The methodological proposal of IPHAN (<http://www.revista.iphan.gov.br/se.php?id=1&ds=17>) will be followed in dealing with the implementation and dissemination of material and immaterial heritage education:

... cultural heritage from its forms of expression; of their ways of creating, doing and living; of scientific, artistic and technological creations; works, objects, documents, buildings and other spaces intended for artistic and cultural manifestations; and urban sets and sites of historical, scenic, artistic, archaeological, paleontological, ecological and scientific value. (Institute of National Artistic Heritage)

The proposal for a material or immaterial heritage education follows the parameters of education integrated to the preservation of cultural heritage, that is, the relationship between the community, education and cultural heritage. In other words, heritage education has as its main framework to take the objects and cultural expressions that support cultural heritage as the beginning of the weaving of recognition of local historicity (historical process), where all its aspects must be questioned and explored: social, political and cultural. economy, translating concepts and knowledge. In this way, the work is carried out with the São Pedro de Cima Community, tracing the following points:

- Consolidate action to preserve and rescue the territorial and cultural heritage of the São Pedro de Cima region and the quilombola community.
- Publicity and Citizenship Awareness of its Social Agents – assist in improving the community's perception, understanding and demand for solutions in relation to its own problems.
- Awakening awareness of its own representation, so that the community can develop its own social, political and, if possible, economic autonomy.
- Affirm the importance of its main identity elements such as the Black Avura Movement and the Council of Residents.

The proposal arises from the importance of the community's heritage, as a set of elements that represent a historicity, that is, a cultural heritage and that can be better understood through the teaching of science geography. Thus, it is possible to analyze the distribution of physical and social phenomena in space, their interference in the construction of landscapes, researching the elements that mark territories and build an attachment to the place of origin.

These points are divided into 4 steps:

Step 1: Observation: sensory perception exercises, through questions, manipulation of objects, measurement, notes, deduction, comparison, detective games, etc. This stage aims to identify the object, its function and meaning, in addition to the development of visual and symbolic perception. Suitable for dealing with children and adolescents.

Step 2: Elaboration of drawings, verbal or written description, graphics, photographs, models, maps and floor plans, modeling, etc. It aims at fixing the perceived knowledge of critical analysis, memory development, logical, intuitive and operational thinking.

Stage 3: Analysis of the local context, raising hypotheses, discussion and questioning, evaluation of research and other sources such as libraries, archives, notaries, family documents, newspapers, magazines, interviews, etc. It aims to develop critical analysis and judgment skills for the interpretation of evidence and meanings.

Stage 4: Re-creation, re-reading, dramatization, interpretation in different means of expression, such as painting, sculpture, drama, dance, music, poetry, text, film and video, class exhibition. This procedure aims at affective involvement, development of the capacity for self-expression, appropriation, creative participation and appreciation of the cultural asset. It should be noted that the entire methodology must first be discussed by the research group and presented to the community, so that procedures that are consensually considered feasible to obtain a greater amount of information and pedagogical value in their application can be removed.

4 EXPERIENCES AND EXPERIENCES

During monthly field trips, in addition to carrying out activities, these aim to strengthen ties with the community, when the group is housed in the homes of the residents themselves, residents who demonstrate a great capacity for reception and interest in contributing to the research.

Among these experiences, we recorded the way people eat. Food is based on habits different from those used by us who have experience based on urban daily life. In the community, the menu is closely related to the economic and work issue, that is, the rhythm of life of the people in the community. Both at lunch and dinner, in their two main meals, carbohydrate intake is intense, to support the heavy work routine and long period without eating.

The following reports are derived from field experience and participant observation of the research group.

4.1 THE COFFEE “PAN”

Also noteworthy is the distinct construction of values, especially in relation to time and space. Unlike the urban environment, where the space/time relationship is inverted, where people organize themselves in a tumultuous way, in the community of São Pedro de Cima everyone is always working in the fields from a very early age. At the end of the journey, they finish and return to their homes doing household chores and getting ready to go to bed and get up early when another day begins. Children, for example, demonstrate a unique relationship with nature, they know the names of trees, birds and other animals in the region and, especially, at the time when nature offers its fruits, this relationship reveals a kind of natural calendar.

It is worth highlighting an important moment experienced in the last field trips. The last trips were made in July and August, a time when the community turns to the coffee harvest. And, a very important aspect is the massive participation of women at this time, where, in addition to working in their household chores, they participate equally in the coffee harvest.



Panha do café - acervo ECOMUSEU

4.2 LIA MARTA MUNICIPAL SCHOOL



Escola na Comunidade São Pedro de Cima – acervo Ecomuseo

The Lia Marta Municipal School is a constant stage for our meetings with the community, the fruits of the project are displayed at the school and a neutral place where all children from families of the most varied religions are displayed.

The community faces some problems. It is worth mentioning that on rainy days classes are suspended due to the bad conditions of the road, since the arrival of students and teachers from neighboring cities, for example, from the city of Divino, is compromised, as the road that connects Divino to São Pedro de Cima is not paved. The school has a lack of improvement courses for the students themselves, as is the case of informatics. However, there have been some advances, such as the project of capoeira classes that, a priori, are aimed at school students, but the extension of access so that classes can be attended by the entire community is already being considered.

4.3 BLACK MOVEMENT

The Black Avura Movement arises from the demand of teachers and students in order to discover or try to unravel its origins. The movement resists as much as possible, the company Samarco donates musical instruments to Avura and workshops with teachers and students are already planned. The movement works at the school and also has wide participation in the discipline of History of Africa, which is one of the proposals contained in Federal Law 10.639/2003.



Placa de identificação da comunidade – acervo Ecomuseu

Law 10.639/2003 is an achievement of the national black movement, in order to insert it into the school curriculum.

Today, we have a framework that allows us to bring these discussions to the teaching of Geography, which is Law 10,639. This law is dealt with in Part 1, “Law 10,639 and the teaching of Geography”. It puts on the agenda – in different ways – that the world of education has to reflect on these issues, it has to reflect on the way in which racial relations are treated within program contents and also in pedagogical practices. It provokes us, therefore, to insert new contents, but, above all, to review contents and pedagogical practices. (SANTOS, Renato Emerson dos, 2007, page 15).

Currently, Avura organizes and participates in the main festivities within the community and is also an important partner in the development of this research. **Preliminary results**

The present extension project entitled Ecomuseu da Comunidade Quilombola São Pedro de Cima, as previously mentioned, arises from field visits in the community of some classes of the course and Geography of UFJF. The first project approved was in 2009, being contemplated by the Ministry of Culture. Since 2009, activities have been officially carried out in the community in order to comply with the schedule proposed in the public notice.

As the main products of the entire research, materials were and are being developed that will compose the material collection of the ecomuseum. It is worth mentioning here that all public notices provide for consumable and permanent material to compose the Ecomuseum. Therefore, a computer, data show, tables, chairs, shelves, cabinets and some consumables have already been acquired that will support the operation of the Ecomuseum.

However, the project goes through a challenge that has been posed since the beginning of the work. As no public notice guarantees the purchase of material for civil construction, we have not yet managed to definitively install the Ecomuseo's physical space.

Several contacts have already been made to solve this problem, such as, for example, conversations with the director of the community school and with the existing council of residents. No solution has been given for this problem. At this moment we are in conversation with the Municipality of Divino to try to make the construction of the Ecomuseum possible in the community.

As part of the entire process, we will describe below what has already been done, what is in progress and future projects.

The Ecomuseum has the proposal to be a space to keep memories of the community. However, it is not based exclusively on memories of the past, but on the production of materials that can ensure that residents see themselves in time and space.

As a result, from these two years of project, the first volume of the booklet entitled "São Pedro de Cima: Nosso Lugar" can be presented, which was a way found to present São Pedro de Cima to the residents themselves, which addressed topics such as "my place and my community." This first booklet produced aims to make residents feel a sense of belonging to the place. Through the stories told and the topics covered in the booklet, the objective is to awaken in them the importance of the community for past generations, present generations and future generations. That even with the entry of the urban model and life, they manage to live with the customs brought by past generations.

The first volume of the Cultural Geographical Atlas is also a result of these two years of work. This volume presents topics such as: "geographical scale, land use and occupation, water resources, relief, spatial representation and discussion on the issue of quilombola recognition". The production of this Atlas aims to make the daily life of the community represented through images, such as maps and photos, being a way to materialize in space.

In parallel with the field work and the production of the Atlas and the booklet, footage was also taken of some residents of the community giving testimonies about the history of the community compared to today. These footage will be edited and will compose the Ecomuseum collection.

Also in partnership with an Agrarian Geography class from the UFJF Geography course and another project to map quilombola communities in Minas Gerais coordinated by Professor Leonardo de Oliveira Carneiro, in 2010, a questionnaire was produced to be applied in the community. . This questionnaire produced information such as age group of people in the community, income, education, sex, types of

plantations. All these data are being accounted for and will form part of the Ecomuseo collection. These questionnaires served to draw a first socioeconomic panorama of the community.

Today, volumes II of the booklet and the Atlas are in progress and will be presented to the community later this year. The presentation will be made to the entire community, school members and possible public bodies that are interested in helping to develop the project.

The booklet volume II has as its themes “youth, gender and black movement”. The booklet's theme is being built together with adolescents and children in the community. It aims to address the conflict between past and current generations, analyze the role of women in the community and discuss the participation and importance of the black movement in the community.

The second volume of the Atlas has the following themes “crafts, family tree of families in the community, handicrafts produced and records of the oldest residents”.

All this material produced in the booklet and in the Atlas is also intended to serve as pedagogical material to be used at school. For this, we are putting together proposals for workshops for teachers to use these materials produced in the classroom.

The mapping of all plantations in the community is also in progress. Part of the existing eucalyptus plantations have already been mapped, showing a certain advance of this monoculture in the community. After that, the coffee plantations will be mapped. This will serve as a basis for a comparative analysis with the area planted with eucalyptus.

All roads that connect the community and those existing within it will also be mapped, as well as the path taken by the pipeline that passes through the community. We also intend to map the main water bodies existing in the community, in order to later analyze their use and their geoenvironmental conditions.

For the next year, even with its activities already started in 2011, the elaboration of the Geographical Atlas volume III and the booklet volume III, in addition to the challenge of allocating the materials produced for and with the community in the future space of the Ecomuseum.

The São Pedro de Cima Quilombola Community Ecomuseum project also has a partnership with the project entitled “From cultural diversity to productive diversity: the construction of knowledge necessary for the agroecological transition in São Pedro de Cima”, which also works in the community.

The importance of participating in this project, in addition to improving the professional training of those involved, is the fact that it is an extension project. This empowers academic praxis and establishes a dialogic space in the effort to build a new moment in the territoriality of the community. It is intended to work with the objectives of consolidating the exercise of citizenship, expanding working conditions, valuing the cultural environment and agroecological practices, as a relationship between the community and nature. For this reason, the Extension preserves the character of interaction, which produces an even greater responsibility for the university group, as we deal directly with the reality of the population.

We aim to show the community the importance of the quilombola culture, the rural environment, show alternative ways of farming, show the importance of the environment in which they live. This gives

people more elements to think about life in/in the countryside and in/in the city. It is worth mentioning that the exchange of knowledge between the group and the people who live in the community is extremely important for the progress of the project. Once we interfere in the local reality, we have to know and respect the knowledge and the desire of the residents of the community.

All this is a way of showing alternatives to the commercial and business logic in force in the field. Which makes the project an even more challenging job.

Therefore, the prospects for the progress of the project are concretely: the development of actions already initiated and the deepening and expansion of the collection of material and immaterial goods of the ECOMUSEU. This year we are already in activity, going to the field systematically, keeping in touch with people and collecting material for the preparation of the booklet and atlas volume II. We are also going to do more mapping of the community to reinforce the collection, as well as establish contacts and partnerships to guarantee the construction of the Ecomuseo building.

As it is an extension project, continuity is a key factor. For this, we already have the approval of a new project for next year in order to continue everything we have built and that we are still going to build.

It is a challenge to be overcome every day.

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CHAPTER 54

The Sports Lockdown in Times of Pandemic: Present and Future

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ABSTRACT

This chapter analyzes the situation of contemporary sport from the perspective of the impact of the COVID-19 pandemic. The use of examples related to international sporting events that were affected by the lockdown serves to reflect an expectation about the

future of global sport. From a SWOT analysis based on situational assessment, the return of activities is explored in a critical way. The position of senior managers in Olympic and Paralympic sport in relation to the pandemic is also used to discuss the situation in question. It is concluded that the return of activities and the execution of the biggest mega events on the planet must take into account the benefit and health of an entire planet, before any other aspect, but above all, conscious management measures are necessary for the full execution of the project. sports planning.

Keywords: COVID-19, Pandemic, Lockdown, Olympics and Paralympic Sports.

1 INTRODUCTION

After the identification of the disease COVID-19 (Corona Virus of the Severe Acute Respiratory Syndrome 2 - SARS-COV-2), based on the evidence pointing its emergence between the end of November and the beginning of December 2019, the routine on the planet has undergone constant transformation.

Sport, in turn, has not exempted itself from this resizing. Italy and Spain held football matches with thousands of spectators at the stadiums. Formula 1 was faced with the indecisiveness about holding the Australian Grand Prix, which was eventually canceled (Richards, 2020). The Tokyo Marathon was canceled for amateur athletes and the professionals ran without an audience on the streets (Mccarthy, 2020). Several trials for the Tokyo 2020 Games were canceled, which created uncertainties for countless athletes. Covid-19 crossed borders and simply caused a lockdown in the sporting hemisphere around the world.

Lockdown is the paralysis of flows, especially those that involve displacement, according to Alexandre Robazza, relationship manager at Sebrae-SP, in an article in the newspaper O Estado de São Paulo (Kerber, 2020). Lockdown measures were adopted in some parts of the world in response to the battle against the pandemic.

Thus, an unprecedented situation in modern sport opened the door and paralyzed the sector worldwide. Competitions were being postponed or suspended. The Olympic and Paralympic Games were postponed to 2021 (McCurry & Ingle, 2020), along with major continental football competitions (Conn, 2020; Ungheria, 2020), after a great discussion about the next course of action for these competitions which come under strict contracts. The major American leagues have been paralyzed or switched their calendar.

Formula 1 canceled four Grand Prix races and has postponed seven races so far. The traditional Wimbledon Tennis Tournament was canceled for the first time since World War II (Carayol, 2020).

In Brazil, the sport also stopped. However, we see discussions about how to maintain the sports industry, which depends on the functioning of the sport and activities to make the wheel spin. With poor sports management, in most cases, we are close to seeing a breakdown, too, in the sports arena.

In football, this issue is more latent, as we have clubs that do not participate in national competitions and are restricted to state competitions. These, even with competitions having been halted without their end, no longer have a perspective for 2020. Athlete contracts are at the end and clubs are not receiving the last sponsorship fee(s) (Beting, 2020; Boni, 2020). Following, there is a confrontation between the clubs and Globo TV to receive the broadcasting rights that concerns the Brazilian football championship, in which it seeks a reduction in the amount which eventually will be paid in the first installments (Folhapress, 2020). Finally, the sponsors see the situation as a threat to the previously closed deal, as there is no certainty that the purchased product will be delivered (Vaquer, 2020).

How to plan the future of athletes and organizations? Will the aid of sports organizations be enough? What about those sports with less expression? Will the professional leagues be able to return under the same status?

Many questions without answers. Perhaps, the last turn point of the sport, happened after the Second World War. From then on sports achieved exponential growth in income and exposure. And now, how will this challenge be faced by sport managers?

2 THE BUSINESS IN PANDEMIC TIMES: SPORTS AND THE NEW FUTURE

The Olympics have previously only been cancelled completely during periods of World War - in 1916, 1940 and 1944 - but never suspended or postponed. The IOC tried to delay the idea to postpone the decision to gain time during the pandemic. After a global pressure for a decision following statements lasting over two days, the IOC decided to postpone the megaevent. Canada announced the drop of the games, and the United States Olympic Committee joined the British Olympic Association in coalition with Germany, Australia, Brazil and Norway in calling for a postponement. However, it will be maintaining the Tokyo 2020 brand live to not affect the commercial relationships and contracts signed before the pandemic.

According to Loy and Coakley (2015) “Sport is characterized as embodied, structured, goal-oriented, competitive, contest-based, and ludic in nature.” Following the three lines, it is possible to classify sports in different dimensions, such as: (a) Sports Leisure or Participation in which the participant is engaged in developing the human essence as a hobby or having fun; (b) Sports for Education, as part of a scholar curriculum model (using an appropriate syllabi) to provide Physical Education in educational institutions; and (C) Sports Performance, a sector dedicated for training and competition, whether or not the athletes are engaged to present the high results of performance (see also, Table 1). According to the NSCA (2017) this sector is highly dependent on fitness training, ej. power, speed, agility, reaction time,

balance, and Body Composition coordination. It is considered in addition, the strong preparation of the athlete to refine techniques, to orientate the decision making process in short reaction time, and to increase the level of competency in sport-specific motor skills.

Table 1. Dimensions of sport in relation to the pandemic.

Dimensions of Sport	Pre-Pandemic	During the Quarantine or Lockdown Period	After-Pandemic
Sport Participation	Everyone practising; indoor and outdoor environment.	Some people practice inside the house; others not practicing at all.	Sports participation will increase exponentially in public areas and under environment spaces outdoors.
Sport Education	PE lessons ranging from 1 to 2 days per week.	Stopped for most of the schools; some institutions organise online classe.	The face-to-face classes tend to return normally. However, the hybrid model, that unifies distance learning and face-to-face classes will be available in the same time
Sport Performance	Athletes are preparing for high-level competition, and for the Olympic and Paralympic Games.	Stopped the training in clubs due to the imposed curfew in most of the countries. But the athletes keep training at home or in centres.	Athletes will start training again for the competitions which were postponed or canceled. Some will have better results and some worse. They will follow standard operating procedures (SOPs) for health protection.

Source: Developed by the authors.

All the sectors in sports are affected by the Covid-19 in different dimensions that require the situational analysis, as recommended by Mataruna (2007) to report a problem identified in a sport event. Mataruna-Dos-Santos, Zardini-Filho and Cazorla (2019) recommended the SWOT Analysis for a strategic planning tool. According to the authors, this analysis (see Table 2) can be used to evaluate the Strengths, Weakness, Opportunities and Threats of company, situation or activity that is required a decision making process. Facing the COVID-19 pandemic period, it is possible to find an analysis to target the possibilities for the safe return of the activities.

Table 2. SWOT Analysis in relation to the Pandemic.

SWOT Analysis	
Strength	Weakness
<ul style="list-style-type: none"> ● Implement strategies to apply in a short period of time. ● Adapt the athletes and teams to train or compete in different environment (for example no spectators). ● Time for innovation and improvement of technology applied to the sport. 	<ul style="list-style-type: none"> ● Stop all the sport activities. ● Canceling Sports events. ● Canceling training from some clubs. ● Some clubs continue training (weakness for the health and performance). ● Athletes' performance dropping.
Opportunities	Threats
<ul style="list-style-type: none"> ● Team skills development (online workshops). ● HR actions improvement (psychology support, accurate information). ● IT/Virtual programmers expansion (AV). ● New Marketing/creative strategies. ● Finance revision considering buffer for emergency. 	<ul style="list-style-type: none"> ● The Jobs of the stakeholders in the sports industry might be affected directly. ● The number of attendees of the sports events might take a long time recover from this crisis. ● The old known ways of organising an event might change drastically due to the COVID-19. ● Postponing the Tokyo 2020 Olympics games to 2021 ● Athletes getting sick from Covid-19.

Source: Developed by the authors.

However, some sectors can use this type of situation for their benefit if they have a proper marketing department. For example, companies which sponsor teams, clubs or athletes, it is possible to develop a campaign supporting people during the crisis and use it as advertisement to get a positive image of the brand. Same approach is applicable for athletes who desire to associate a positive image to their names through donations, volunteering and creating awareness campaigns with governments and health organizations. It is the case of many sportsmen in Brazil that joined their efforts with singerst to donate money for people living under social vulnerability or for people on the streets through live concerts or campaigns. Other initiatives used in the three levels were: live classes, sport challenges, sport training, marathon contest (indoor at home), and many other strategies.

During the quarantine, gyms lost income because there are no new customers and actual members are not consuming their product as Personal trainer sessions, supplements and tracking devices. The strategies applied by some gyms at the moment are renting their machines such as indoor bicycles and treadmills (Professionals and Amateurs) and keeping the sales team active through broadcast emails to prospective consumers; giving free months or discounts for buying a new membership which will start after lockdown. The gyms are exploring social media channels to sell packs and to maintain a positive relation with the customers. However, after the lockdown period, members will be back with some extra weight

gained and ravenous for losing the fat and getting active again; the time when the gyms can improve their income and profit. In all business, it will be necessary to respect the new orientation or policies from the government such as: compulsory social distance over 2m, keep sanitizers available and in some cases orientate the trainers to use masks and other face protection elements (WHO, 2020).

A huge number of personal trainers are already providing online courses and training sessions, as well as some coaches are coming with innovative workouts orienting how people can continue training and stay active inside their home; possible by the time several people will have their own gym and own workout routine at home. Gyms are now offering on-line classes with trainers in a personalised way with better prices. The on-line personal training can be implemented by a big number of professionals, in order to keep the fidelity to the PTs. Following different strategies, the companies could maintain the laborers jobs and pay their salaries on time or with less reduction, as well as rather than keep the equipment not being used in the gym building, gain some profit by renting their equipment. The impact in the economy is visible and will affect all sectors of the society. The association of social media influencers and trainers are providing cases of sport engagement success.

The sport clubs have the right to reduce the salaries of all their employees including the athletes, because they are private properties and most of the businesses are locked down. This action avoids employees becoming redundant and assuring the employability index. The current situation of Covid-19 is uncontrolled and the innovation in the marketing perspective is necessary to provide new models for this industry.

3 SAILING IN ROUGH WATERS: THE ADVANCEMENT OF COVID-19, THE IMPACTS ON CANOE SLALOM AND THE POSITIONING OF THE ADMINISTRATIVE BODIES OF THE SPORT

Canoeing in a very broad sense is the simple act of driving any floating object, aided by paddles. Given these circumstances, it can be practised in any layer of water, which makes it possible to guide the different vessels, whether individually or collectively, subdividing into three different segments: utility, leisure and competitive¹ (Merkle, 1993).

Canoe Slalom is an Olympic sport, through a course (between 250 to 400m) of hanging downstream or upstream gates on river rapids (natural or artificial). Each gate consists of two poles hanging from a wire strung across the river. There are 18-25 numbered gates in a course, of which 6 or 8 must be upstream gates, and they are colored as either green (downstream) or red (upstream), indicating the direction they must be negotiated.

¹ The Brazilian Canoeing Confederation - CBCa consists of thirteen modalities: I) Speed (Olympic event since 1936), II) Slalom (Olympic event, first edition in 1972, reintroduced to the Games in 1992) and Extreme Slalom kayak, III) Para Canoe (Paralympic event since 2016), IV) Downhill, V) Marathon, VI) Oceanic, VII) Wave, VIII) Kayak Polo, IX) Dragon Boat, X) Traditional, XI) FreeStyle or Rodeo (currently inoperative), XII) Rafting (emancipated), XIII) Wa'a or Hawaiian Canoe(emancipated).



Photograph²: Brazilian canoeist, Pedro Henrique Gonçalves da Silva, on the World Championship (2018)

It is conjectured that to return to training, it is expected to take into consideration the social context of the sports centres. For international championships, the particularities of the host country in the face of pandemic must be analyzed, even as the control of athletes, technical staff, press, among other people who will take part in the event, through regular testing for COVID-19, to keep the safety of everyone involved in the event.

We have to get to the point where everyone is safe, able to train and prepare so that we can restart.
- ALEXANDER SLAFKOVSKY³.

For this reason, when dealing with sports competition, it is appropriate for the occasion to highlight two aspects:

I) The conceptual understanding of sports training, aimed at improvement and the high level of performance. In this sense, high performance is one of the promoters of the show, defined by Greco (2000, p. 29) as:

The 'Sports Training' system has as its objective its direction to achieve adequate results in high-performance sport, optimizing the athlete's potential, aiming to present maximum outputs. Thus, aspects such as available organizational infrastructure, self-interest and predisposition of the individual, diagnosis and prognosis of the evolution of the level of performance in the modality (SIC:event), physical-technical, technical-tactical, tactical-psychological evolution ethically feasible to the athlete, biotypological prerequisites inherent to the chosen sport, must be permanently related to the sport.

II) The understanding of the globalization of the sociocultural sports phenomenon, both as a practice and as consumption by the masses. Given this, the high level of performance is one of the gears for the movement of the prosperous market of products and/or services, because when offered as the main attraction, it provides the spectacle for potential consumers. Because of this reality, Constantino (1990, p. 78) identifies the values incorporated into the sport and considers that:

Sports 'show-business' went through everything and everyone. He perfected market research techniques. He applied marketing. He projected the image. It fueled its media consumption. It removed the added value of being a phenomenon of the masses. It was used for advertising purposes.

² Photograph: Buda Mendes. Retrieved from: <https://www.zimbio.com/photos/Pedro+Goncalves/2018+ICF+Canoe+Slalom+World+Championships/LKO1fOurVR7>

³ Slovakian Alexander Slafkovsky was a silver medalist in the 2013 and 2017 world championships and European champion in 2014, 2016 and 2017 editions. He is currently the world representative of slalom canoeing athletes.

It intensified economic relations. It served as a means of ideological political affirmation. He sat at the negotiating table in the face of world conflicts.

The objectives proposed here to present the impacts caused in the training and competitions of the Olympic sport Canoe Slalom, accompanied by the positioning of the administrative bodies of the sport: International Canoeing Federation - ICF and Brazilian Canoeing Confederation - CBCa, as well as the Olympic institutions: International Olympic Committee - IOC, Tokyo Organizing Committee, Brazilian Olympic Committee - COB for the 2020/2021 biennium. We are aware of the incipience of this essay, due to the innumerable unknowns to be solved, but it is relevant given the complexity of the storm that humanity has been going through, with sport being one of the vessels to face it.

After identifying the onset of the disease COVID-19 (Corona Virus of the Severe Acute Respiratory Syndrome 2 - SARS-COV-2), based on evidence pointing between the end of November and the beginning of December, in the province of Hubei - China, since then, its progress has been colossal. In January it arrived in Europe and Oceania, in the following month, the American and African continent diagnosed the first infected patients and when spreading across the planet, it was classified by the World Health Organization as a pandemic on March 11, 2020 (WHO, 2020c).

In the first months of 2020, insecurity hovered across the globe and immediate readjustments needed to be established in the economic, social and cultural spheres along with the reinvention of everyday life was put to the test; promoting inevitable strangeness and discomfort caused by the short time for reorganization in the routine.

The sport was not exempt; in a short time, the training was interrupted to comply with the isolation recommended by the World Health Organization (WHO) measures adopted by most of the affected countries. Sports organizations showed solidarity and engaged in combating the spread of the disease and preserving the health of athletes.

The International Canoeing Federation (ICF) has 157 affiliated entities, is present on five continents. Annually it fulfils a vast calendar of competitions, in 11 official modalities, offering courses, training and assemblies.

However, its first official statement was dated March 2, 2020, with mild measures, because at the time, despite the progress of the disease, the countries were not in such alarming situations:

The International Canoeing Federation (ICF) is regularly receiving updated information from the advice of health experts and the International Olympic Committee (IOC) on the status of COVID-19. The virus has already caused serious disruption at sporting events around the world, but so far the canoeing program has not been affected. Currently, Chinese athletes (of high performance) are outside their country and the ICF does not have events scheduled in China for this year. Changes and travel restrictions may affect some of our qualifying events for the Tokyo 2020 Olympic Games. We continue to follow the recommendations of the World Health Organization (WHO), the International Olympic Committee and making decisions in the best interest of everyone involved. ICF continues to monitor the situation. Family health and safety canoeing are our priority (ICF, 2020).

Soon after the first communiqué, weekly newsletters began to be published on the ICF website, warning about the proper precautions to be taken. Competitions have been cancelled or postponed on all continents. The 32nd edition of the Olympic Games, scheduled to be held in Tokyo, from July 23 to August 9, 2020, was under constant pressure for the postponement to happen.

Countries like Norway, Canada, Spain, Italy, Australia, Brazil and Great Britain added to the North American athletics and swimming federations who were already positioning themselves in favour of changing the date. It is appropriate to emphasize that the countries with more tradition in the Winter Olympic Games - Canada and Norway - were the most incisive (and supportive), even declaring a boycott, if the events were maintained in 2020.

The North American Swimming and Athletics Federations, with the largest number of medals in dispute⁴, knowing their political strength due to sports that have a huge television and media audience, asked the United States Olympic Committee to advocate for the date to be revised and extended by one year.

The Brazilian Olympic Committee - COB, in an official statement issued on March 21, 2020, demonstrated a reciprocal position to the postponement, as explained by Paulo Wanderley, president of the entity.

The Brazilian Olympic Committee defends the postponement of the Tokyo Olympic Games to 2021, in a period equivalent to that originally scheduled. (...) "The IOC has experienced immense problems before, as in the episodes that culminated in the cancellation of the Games of 1916, 1940 and 1944, due to the World Wars, and in the boycotts of Moscow 1980 and Los Angeles 1984. The entity he knew how to overcome these obstacles and we see the Olympic Flame stronger than ever. I am sure that Thomas Bach (president), gold medal athlete in Montreal 1976, is fully prepared to lead us in this difficult time" (COB, 2020).

With such international pressure, the maintenance of the Games was inevitable, leading the President of the International Olympic Committee - Thomas Bach and the Japanese Prime Minister - Shinzō Abe⁵, to jointly postpone the 32nd edition to exactly one year.

For this cautious moment, the International Canoeing Federation (ICF) was favourable to the measures adopted, according to the statement issued on its website, on March 24th. It is worth noting that the publication only took place after the Committees (Olympic and Organizer) made official the 1-year extension of the Tokyo Games (ICF, 2020). It is presumed, therefore, that there is a punctual alignment of this Federation with the International Olympic Committee for decision making.

Atypical situations caused by COVID-19 put countries in unequal performance conditions in a short time. However, it is known that the performance of sporting excellence (especially the Olympic) is

⁴ Vecchioli (2020) noted that two sports won the largest number of medals for the United States. In the Rio Olympics 2016, North American swimming rose to the podium 33 times and athletics 32. Therefore, they would only be behind Great Britain (by the difference of 02 medals), China (five medals) and, of course, the United States as a whole. Swimming, if classified as a country, would rank eighth in the overall Olympic medals table.

⁵ The meeting also included: Mori Yoshiro - President of the Tokyo 2020 Organizing Committee; Hashimoto Seiko - Olympic Minister; Koike Yuriko - Governor of Tokyo; John Coates - Chairman of the IOC Coordination Commission; Christophe De Kepper - Director General of the IOC and Christophe Dubi - Executive Director of the IOC Olympic Games.

associated with several other factors. Vagenas and Vlachokyriako (2012, p. 211) when correlating the demographic and socioeconomic profile of the countries participating in the Athens Games - 2004, concluded that: “The achievement of Olympic medals depends on the combined potential of population, wealth, growth rate, unemployment, former host and spending on social sports”.

Despite all the historical differences between countries, considering the demographic and anthropometric profile of the population, socio-economic development, cultural characteristics, investments in sport, among others, it is up to us to register the comprehensive position of Alexander Slafkovsky, in an interview given to ICF, being one of the shortlisted to represent Slovakia at the Tokyo Games:

You (SIC:he) want to go to the Games, as long as everyone can prepare and you (he) want to compete when everyone has a chance to prepare enough to be at the Games. (...) It would be unfair to all other athletes who can do nothing. Here in Slovakia, we can do something (SIC:train), but everyone is in the same boat. We can't say: okay, let's train and compete, while the rest of the world is locked up (ICF, 2020b).

Even with the uncertain future, sport is reinventing itself, athletes are looking to remain physically active and new ways are being put into practice for social re-framing. The Brazilian Confederation of Canoeing-CBCa, in the second half of March, after the national trials, released the athletes of the national team to return to their cities. The athletes went through social isolation by performing physical training in their homes, monitored by the technical staff and under local flexibility policies, gradually resumed specific training in their clubs.

4 ECONOMIC PROTOCOL X VALUES: RECONNECTING THE GAMES

The pandemic opened up some issues that we thought were consolidated in the most diverse sectors of society. In sports, a very latent issue was the hosting of the Olympic and Paralympic Games in Tokyo.

At the beginning of March 2020, Thomas Bach (IOC President) went so far as to say that the IOC was fully committed to the Games on the previously planned date. Also, he encouraged athletes to keep their preparations (Euronews, 2020).

It is not known for certain why this posture. Whether it was triggered due to lack of knowledge about the extent of the lethality of the virus, or whether due to the economic protocol that involves the Games. One can see the erratic conduct of the decision-making process about the future of Tokyo 2020.

Just two days before the announcement on the postponement of the Games, the IOC issued a statement setting out some scenarios for the Games. What would serve as a basis for the best decision was taken in favor of all stakeholders (IOC, 2020). However, between the lines of the Olympic world, what was said about the delay in making this decision was due to the complex contracts involving the Games, as well as the contracts with the sponsors.

So, this position on the part of the authorities was delayed as much as possible. Although everyone involved (IOC, Organizing Committee, and Government of Japan) declared the maintenance of the Games, it was more difficult to maintain this position every day.

As said by Bull (2020), the IOC had an opportunity to take the global leadership as often claimed. He continues:

Because if the delay caused by the coronavirus pandemic is a crisis for the IOC, it's also an opportunity for it to prove the Games really do have a greater significance to us all. And its leaders being criticised for delaying the decision to postpone the Games so much longer than many of the competitors felt was necessary (as recently as three weeks ago Bach was still insisting that they would go ahead as scheduled) that will matter less, in the end, than what comes now, and whether the IOC gets its next steps right.

Only at the end of March, when it no longer made sense to insist on the Games, was the Games postponed confirmed. Japanese Prime Minister Shinzo Abe declared that: "we agreed that a postponement would be the best way to ensure that the athletes are in peak condition when they compete and to guarantee the safety of the spectators" (McCurry and Ingle, 2020). Meanwhile, Thomas Bach said: "this is about protecting lives" (BBC, 2020; Grohmann, 2020).

About the challenge never saw before, Bach noted: "we will work hard now to undertake this extremely challenging task of postponing the Games and of organising postponed Games, which have never happened before, so we have no blueprint for this" (Tokyo 2020, 2020).

Andrew Parsons, President of the International Paralympic Committee (IPC), declared:

Postponing the Tokyo 2020 Paralympic Games as a result of the global COVID-19 outbreak is absolutely the right thing to do. The health and well-being of human life must always be our number one priority and staging a sport event of any kind during this pandemic is simply not possible. Sport is not the most important thing right now, preserving human life is. It is essential therefore that all steps are taken to try and limit the spread of this disease (IPC, 2020).

It is important to note that, despite the organization of the Games encompassing the Olympic and Paralympic, the rich cousin and the IOC are the ones who have the greatest decision-making power. The Paralympic Games have always sought to be part of this "circus". Since 1988, the Paralympic Games have followed the Olympic Games in the same host city and since 2000, there has been a formalized understanding between the parties.

Through the signing of a Memorandum of Understanding in 2000, basic principles and relationships between the International Olympic Committee (IOC) and the International Paralympic Committee (IPC) were established, ensuring resumption of their organisation in the same city. This obligation was included in the Host City Contract. In 2001, the second part of the Agreement was signed, protecting the future of Paralympic Games, and since then many extensions of this agreement have occurred, formalising the 'One Bid, One City' concept (Brittain 2010; IPC 2014).

However, even though the agreement provides greater financial support, brand protection for the Paralympic Movement, and includes further co-operation in a range of other areas, the Paralympic Games still suffer from a lack of funding, with a lesser degree of importance given by society in general, as well as the complexity in the relationship between the Committees and the difference in philosophical and ideological foundations.

The discussion about the dichotomy between the Games and the financial issue has been fostered for some time. Cities give up their candidacy, some due to pressure from the population itself, others due to financial demands that end up exhausting the local budget.

For the Modern Era of the Olympic Games, Pierre de Coubertin, using the traditional concept of the Games, rescued in order to promote the changes that were necessary at the end of the nineteenth century, bringing to the sports field the clashes that occurred in other spheres. That is, Coubertin sought means for the promotion of peace, taking advantage also of the emergence of internationalist organizations (Tavares, 2003).

Nevertheless, it seems that the financial sphere has supplanted the original idea of the Games. Today, the clashes are a little bit different. The economy has appeared as the main focus on the Olympics background, bringing the Games as a powerful tool to promote the cities, either by leveraging your image or through your own development.

On the other hand, the Paralympic Movement appears to give a chance for those was condemned because of serious injuries. Until then, these people carried a death sentence after suffering the injury. After Guttman recognized the physiological and psychological value of sports in the rehabilitation of the patients, sports worked as a factor of social integration, especially when it was perceived that it provided good results in medical treatment (Brittain, 2010; Legg & Steadward 2011; Brittain, 2012; Mataruna-Dos-Santos, L, Guimaraes, A., Range, 2018, Mataruna-Dos-Santos, Khan & Al-Shibini, 2018; Santos Neto, Oliveira, Cardoso & Haiachi, 2019). Thus, it is so complex to evaluate the dichotomy between values and economic protocols (sponsorship, deals, broadcast rights, licensing, among others). If in one hand the main advertising throws the light on values, the economic protocol is mandatory to keep running gear during the whole time.

5 FINAL CONSIDERATIONS

For the sport's definitive return, the opening of the practice centres should be considered, in the case of canoe slalom, it is the natural or artificial course, generally integrated to the tourist and sports complexes or hubs, so that the training periodicity is re-established.

Regarding the organization of national and international competitions, it is necessary to consume the services offered by the chains and sectors of the hotel, gastronomy, security, cleaning, transport, tourism operations, among other areas that are essential for holding events of this size.

Specifically in international competitions, even if the host country demonstrates to be in comfortable conditions and progressive control of the disease, as is the case in Slovenia ⁶, it will receive athletes, technical staff and the press from all over the planet, which could harm the stability previously achieved.

Finally, we list actions, aiming to respect the particularities of the host countries: I) A peculiar analysis of the progress and, consequently, the confrontation of COVID-19 in its territory, taking into account the policies for the prevention and circulation of people; II) Providing health infrastructure to the population; III) Socioeconomic restoration; IV) Progressive and safe resumption of daily activities.

Despite the complexity of the current period which requires time, solidarity, investments and joint efforts by the Nation States to solve the pandemic, the deadlines for holding events, including sports, are stipulated according to the demand for financial resources, personal and infrastructure. Despite all these aspects and difficult as it may be, at first the postponement is established, until the necessary cancellation, if it is so vital for human health.

⁶ On May 14, 2020, Slovenia (a country with approximately 2 million inhabitants) announced that it had controlled the spread of COVID-19, but preventive measures would remain in place. On May 23 and 24, the country was the first in Europe (perhaps in the world) to hold a national slalom canoeing event and, following international recommendations, vetoed the public's presence (ICF, 2020c)

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CHAPTER 55

The right to work in the context of human rights: a perspective of Joaquin Herrera flores' critical theory

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ABSTRACT

Faced with the historical process of human rights and the struggle for the dignity of the human person, the right to work emerges as a regulation of the employment relationship as a guarantee of access to

indispensable resources for the survival of the individual and access to goods. In addition, it extends to the need to guarantee decent working conditions, seeking to protect the worker from the violation of rights. In this sense, this article seeks to reflect on labor law in its intersection with human rights, based on the critical theory of Joaquin Herrera Flores.

Keywords: Human Rights; Right to work; Dignity.

1 INTRODUCTION

It is considered the duty of the State to promote actions and guarantee the minimum conditions of life for citizens. Work, as a source of resources to meet the basic needs of individuals, becomes a fundamental right within the legal framework, whose purpose is to be carried out in a dignified manner, where the worker feels respected and his activity is valued economically and socially.

Based on Critical Theory and the approach of Joaquín Herrera Flores on human rights and the processes for the effectiveness of these rights, considering the existing disparities, it is intended to correlate labor law and the author's critical theory, as well as access to a dignified life, object, including, of international conventions and treaties.

Universalizing human rights is not an easy task, especially in the face of globalization, neo-capitalism, and social changes. With this, it is necessary to join forces between countries to strengthen critical thinking and the defense of these rights, establishing a world order that guides the fundamental principles.

2 HUMAN RIGHTS AT WORK

Considering the long historical processes of human dignity, it is important to contextualize the search for human rights and Herrera's critical theory, so that it is possible to verify how these rights are placed under the perspective of the right to work.

For the universality and protection of human rights, it was necessary to limit the power of the State, since state sovereignty made it difficult to implement humanitarian law and ended up violating several rights.

(Piovesan, 2013)

With the signing of the Treaty of Versailles at the end of the First World

War, in 1919, the International Labor Organization - ILO emerged, seeking to promote the minimum conditions for decent work. (ILO, BRASILIA).

Internationally, the ILO was responsible for strengthening the importance of the compromise between labor law and human rights,

shedding light on the need to ensure the well-being of workers in the workplace. It brought to the discussion the conditions of human dignity and the need for full protection (Piovesan, 2013).

Through various Conventions on the right to work, the ILO encompasses 187 Member States that seek to promote productive work worldwide, with security, freedom, equality and opportunity for men and women, with a view to reducing social inequalities and overcoming poverty (ILO , BRASILIA)¹ .

Still as a reflection of the recovery of nations in the post-war period, based on the atrocities suffered and on the ideals of respect, freedom and equality, on December 10, 1948, the Universal Declaration of Human Rights was promulgated. The protection of the human being and a dignified life through an instrument that encompassed all Nations, was intended to build a society focused on the well- being of the human person, despite the suffering brought about by the various rights violated by the State (OLIVEIRA, 2016).

With the Universal Declaration of Human Rights - UDHR, in 1948, the dignity of the human person is treated as a central focus

through this document. Among these rights, article 1 provides that: “All human beings are born free and equal in dignity and rights (...)”

(DDH, 1948). The right to life, liberty, property and work are also provided for, highlighting:

Article XXIII

1. Every human being has the right to work, to free choice of employment, to just and favorable working conditions and to protection against unemployment.
2. Every human being, without any distinction, has the right to equal remuneration for equal work.
3. Every human being who works has the right to just and satisfactory remuneration that will ensure him and his family an existence compatible with human dignity and to which, if necessary, other means of social protection may be added.
4. Every human being has the right to organize unions and join them to protect their interests.

¹ Available: <https://www.ilo.org/brasilgia/temas/trabalho-decente/lang--pt/index.htm>. No date and again.

In Herrera's view (2009, p. 27), we say that we all have rights, but the vast majority of the world's population cannot exercise them due to lack of material conditions to do so. In this way, it can be said that the existence of human rights alone is not a reality for all people.

THE profound inequality between social classes becomes an obstacle to the exercise of these rights. Therefore, human rights should not be understood in isolation, as they arise from a historical and cultural context that, at first, is seen with a colonizing and non-emancipatory perspective. The author emphasizes that the State leaves the control it had over the market and starts to be influenced by the capitalist system, the which ends up limiting the power of the State to promote the rise of individual freedom and rights.

Understanding the challenge for the realization of these rights, Herrera (2009, p.17) explains that "The globalization of capitalist rationality supposes the generalization of an ideology based on individualism, competitiveness and exploitation". Although we talk about the various human rights, the realization of these ends up being distant, since we are facing a society formed by individuals who are concerned only with themselves. The struggle for equality and for the dignity of people becomes compromised, as such rights are often violated and this violation becomes naturalized, causing human rights to end up taking another social format, merely an object of discourse and announced.

by the State, failing to achieve its objective. (Herrera, 2009)

Since rights are considered a cultural product, the importance of the existence of legal norms for the protection of labor rights is unquestionable. Through them, rules are established for the employment relationship and instruments are created to combat eventual injustices and demand the rebalancing of the contractual relationship. Herrera points out that:

With labor legislation that guarantees the rights of workers, we will be able to denounce situations legitimized by principles of justice that, in their foundations, are defined for the benefit of only one group, which transgresses. continuously the procedures "publicly" recognized "as valid in terms of their own interests" (Herrera, 2009).

In the author's view, the path may be through the creation of a culture that brings politics, economy and culture together, through the legal system that guarantees a more equal and generalized access to social goods.

2 THE HUMAN RIGHT TO WORK

In its primary condition, the human being has survival as its main objective.

To survive it needs food, shelter, clothing.

To obtain the necessary goods, it lacks resources. As a synthesis of the solution for this cycle, work appears as a means to obtain resources that enable the acquisition of goods to guarantee the survival of individuals.

Work, therefore, is born from a double relationship: the natural and the social. It is natural as a mediation with nature; social when their actions have repercussions on other individuals. The latter is understood as the cooperation of individuals and constitutes the productive forces linked to the division of labor.²

In this way, needs are extended to other individuals, creating the social relationships that determine the historical conditions of work.

The dependence between human beings is reciprocal, that is, one cannot survive without the other. Their needs are historically produced in social relationships, constituting subjectivity and objectivity and their distinction from animals.

The work and its product belong to the one who performs it or to another to whom the performer is subordinate. This relationship that is established between the two from the ownership of the means of production. For those who are responsible for the work, there is also the physical effort and the allocation of time. For the other, production and profit. While for the former, work means the counterpart for the sale of his time and strength, for the latter it represents the

fruits of the investment made in the means of production. In Marx's words, if for one it is torment, for the other it is satisfaction:

The being to whom work and its product belong, to whom work is devoted, and for whose enjoyment the product of work is intended, can only be man himself. If the product of labor does not belong to the worker, but faces him as an alien force, this can only happen because it belongs to a man other than the worker. If his activity is a torment to him, it must be a source of satisfaction and pleasure to another. Not the gods nor nature.

The presence of this tension is justified by the “exchange” of work for necessary resources (not always achieved). According to Herrera Flores, as already stated, dignity is linked to access to fundamental goods for survival, and the law is not capable of guaranteeing effectiveness only by its existence. For him, the right is not obtained immediately from the legal determination. More than that, the right comes only after the fights, but only man himself can be that strange force of men. (MARX, 1983: 98)³

It is not just the creation of a right that makes it exist in the world of things. A norm can be created to establish a right without this right becoming effective, as the conditions of each individual and the society where he is inserted shape this reality. The consequence of this is the inefficiency of the remuneration for the work performed to respond to the totality of basic needs for subsistence. Although many workers find a job, in contrast to the many who cannot find a job, even so, the earnings from this work may not correspond to the minimum necessary for their maintenance. In this reality, work would not be providing basic conditions of subsistence to the worker, depriving the individual of the enjoyment of a dignified life.

² THE CONSTITUTIVE RELATIONS OF THE SOCIAL BEING BASTOS, Rachel Benta Messias, https://files.cercomp.ufg.br/weby/up/248/o/Rachel_Benta_Messias_Bastos.pdf. Accessed on Aug 05, 2022

³ MARX, Karl. “Economic and Philosophical Manuscripts.” In: FROMM, Erich. *Marxist Concept of Man*. Rio de Janeiro: Zahar, 1983, p. 85-169.

Explained by Herrera Flores, human dignity is linked to guaranteeing access to housing, work, the environment, citizenship, healthy food, time for leisure and training, expression, religious conviction, education, historical-artistic heritage, etc.⁴ Only after having conquered these goods is that individuals take possession of their place in society and start to interact and interfere in the environment. Social recognition, non-invisibility, not being on the sidelines gives it dignity. The prediction of these achievements must be supported by the legal norm and this, have its effectiveness, which does not occur in most cases.

According to that author, the law establishes what we should have and not what we actually have, including with regard to equality.

In this sense, the right to work, foreseen as a fundamental right in the Federal Constitution, must be among the goals of the Welfare State. Through employment policies and the promotion of entrepreneurship, the State greatly contributes to the reduction of social inequalities, improvement of living conditions, access to education and goods, achieving the desired dignity of the individual.

The law in its essence is focused on hegemonic processes, with the legislator having the function of establishing norms that favor access to goods and rights, transforming reality and bringing more equality and promotion to social goods. This evolution in the way of seeing the law, not as something fixed and definitive, but as adaptable to the conjuncture, makes possible the reformulation of the dominant economic and political systems.

The issue of access to equal opportunities is intertwined with the struggle for democracy and justice. Regarding democracy, it is possible to say that there are several models of democracy. Many theorists risk the best concept within

diverse theories. However, it is not an easy task, as an analysis of the concrete case is necessary, considering the specificities and conditions in which democratic systems are applied. In relation to the question of the concept of justice, it is even less generic, implying, in addition to all the specific characteristics of the fact to be analyzed, in the conjuncture and in the referenced culture. Thus, various models and theories try to explain and characterize democratic systems and justice in its fullest sense. However, democracy and justice are more linked to the culture of a society and, consequently, also to the practice of equal opportunities.

One of the areas where inequality of opportunity is most observed is work.

As well as human rights, work is also greatly affected by neo-capitalism, leaving the employee without conditions of choice and doomed to accept the conditions imposed by the employer. In line with the interests of capital, with a greater number of workers than formal jobs, there is no guarantee of ideal working conditions.

⁴ Herrera, p. 28-38.

Those who get a job are subject to the conditions offered by the employer, even if their rights are violated to some extent.

In all this orchestrated set, the intended result is always the growth of capital accumulation. Financial speculation, the presence of transnational companies and the difficulty in promoting income distribution make the construction of social equality less and less possible.

Once again, the struggles against social injustices, in any dimension, occupy a prominent role for human emancipation and liberation.

The advance of the forms of exploitation of workers by capital was such that today accumulation permeates all areas of life.

In times of weakening of individual labor relations, the path of social relations proves to be efficient in adding economic and social value to workers through movements, associations, non-governmental organizations, etc. As a result, there are policies for the recognition of rights and actions for human emancipation and liberation.

The boundaries of accumulation extend to such an extent that they invade language, affections, brains, the ability to cooperate, the task of caring, the use and knowledge of new (and old) technologies and even traditional knowledge itself. of historically marginalized and exploited peoples. The exploitation of the human by capital is now confused with social activity.

Even with stronger movements and the action of emancipatory groups, the neoliberal system will continue to privilege the market.

Consequently, the application of norms will always fall short of guaranteeing equal access to goods.

A critical theory of law must be supported, then, on two pillars: the reinforcement of legally recognized formal guarantees, but, equally, the empowerment of the most disadvantaged groups to fight for new, more egalitarian and generalizing forms of access to goods protected by law. . (HERRERA, 2009, p.19)

In this perspective, Herrera proposes a new perspective of rights as institutional and social processes that enable the opening and consolidation of spaces for the struggle for human dignity. To analyze the law to work as a fundamental right, it is necessary to understand the serious consequences of normative deregulation of labor relations, as well as spatial displacement⁵. Such changes in the employment contract, always with a view to increasing competitiveness and the flexibility of the contractual relationship, generate new forms of production, based on machinery and the use of increasingly advanced technology. In this scenario, the social relations themselves are transformed and the “human doing” starts to have a territorial, social, sexual and ethical division.

In the current conjuncture, the surplus value is not limited to the employee's surplus time delivered to the owners of the capital. It also covers all the accumulated knowledge, its creativity and its ability to

⁵ Relocation: refers to the transfer of an industrial activity from one country or region to another location, with the aim of reducing production costs.

modify the environment in which it is inserted. “It is cognitive capitalism and consists of the new way of extracting and accumulating social value produced by workers”⁶. Nowadays, what we see is a globalized and neoliberal world, commanded by large economic groups and market institutions (World Bank, WTO, IMF), which has demanded a reformulation of Human Rights and its true adaptation to new issues such as the deterioration of the environment, cultural differences and intolerances, war scenarios, etc.

3 INTERNATIONAL WORK AND CONVENTIONS

According to Herrera, today the great challenge is to defend ourselves against the ideological avalanche provoked by the aggressive and destructive growth of neoliberalism on the social achievements hard-won by the struggles of social movements, left-wing political parties and unions for more than a century and a half.⁷

Even with the prerogatives of the directive power provided for by law and the employer being the holder of this power of its business, such as, for example, applying punishments in the face of the employee, each and every case must be analyzed in the light of human rights, after all, the dignity of the human being in no way should be violated, including and especially in the work environment.

In a globalized world, international relations are increasingly closer and lead to a worldwide trend of labor regulation within parameters that protect human dignity and avoid unfair competition within an economic vision of labor costs.

Common point, it can be related to international treaties and agreements, agreements between Nations with the objective of making standard the treatment of common issues between them. Issued by international organizations, these standards are ratified and accepted by each of the participating countries. Among these documents, of outstanding importance for the Brazilian labor law, the Universal Declaration of Human Rights and the Conventions of the International Labor Organization are cited.

The Universal Declaration of Human Rights - was proclaimed by the United Nations General Assembly in Paris on December 10, 1948, through General Assembly Resolution 217 A (III) as a common standard to be achieved by all peoples and nations. With this document, the universal protection of human rights was established for the first time.

Everyone has the right to work, to free choice of work, to equitable and satisfactory working conditions and to protection against unemployment. Everyone is entitled, without any discrimination, to equal pay for equal work. Anyone who works has the right to equitable and satisfactory remuneration, enabling him and his family to live an existence worthy of human dignity, supplemented, if possible, by all other means of social protection. Everyone has the right to form trade unions with others and to join trade unions to defend their interests.⁸

⁶ Herrera Flowers

⁷ Herrera Flores, Joaquin. *The reinvention of human rights.* / Joaquin Herrera Flores; translation by: Carlos Roberto Diogo Garcia; Antônio Henrique Graciano Suxberger; Jefferson Aparecido Dias. – Florianópolis: Boiteux Foundation, 2009.

⁸ Universal Declaration of Human Rights, 1948. Art. 23.

In her work, *The (re)invention of human rights*, Herrera Flores states that human rights can be achieved through the social practices of NGOs, Associations, Social Movements, Trade Unions, Political Parties, Citizens' Initiatives and demands of groups, minority (indigenous) or not (women), who in one way or another have traditionally remained marginalized from the process of positivization and institutional recognition of their expectations.⁹

Through access to work, the human being is socially dignified, assumes an identity before society and strengthens himself as a social individual by assuming responsibility for his survival, this due to his immaterial component that gives distinction to the one who works. Dignity prevents man from being used as a mere instrument or means to achieve an end. The human being is an end in itself and its “reification” is not allowed under any circumstances.¹⁰

The struggle for the recognition of human rights leads to the study of the International Labor Organization, as the main body of supranational labor standards, considering its political importance and its sui generis composition that give it prominence from a social and economic point of view for development of nations.

It was only after 1985, through the country's democratization process, that Brazil started to ratify relevant international human rights treaties. The starting point for the process of incorporating international human rights treaties into national law was the ratification of the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment, in 1989. In other words, only with the democratic Constitution of 1988 Brazil becomes part of the group of countries united by the recognition of human rights.

As of the 1988 Charter, Brazil ratified:

- a) the Inter-American Convention to Prevent and Punish Torture, on July 20, 1989;
- b) the Convention on the Rights of the Child, on September 24, 1990;
- c) the International Covenant on Civil and Political Rights, on January 24, 1992;
- d) the International Covenant on Economic, Social and Cultural Rights, on January 24, 1992;
- e) The American Convention on Human Rights, on September 25, 1992;
- f) The Inter-American Convention to Prevent, Punish, and Eradicate Violence against Women, on November 27, 1995.

⁹ Herrera Flores, Joaquin. *The reinvention of human rights*. / Joaquin Herrera Flores; translation by: Carlos Roberto Diogo Garcia; Antônio Henrique Graciano Suxberger; Jefferson Aparecido Dias. – Florianópolis: Boiteux Foundation, 2009.

¹⁰ Miraglia, Livia MM *The right to work and the dignity of the human person – due to the need for decent work, a human right*.

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The innovations introduced by the 1988 Constitution — especially with regard to the primacy of the prevalence of human rights, as a guiding principle of international relations — were fundamental for the ratification of these important instruments for the protection of human rights.¹¹

In order to reach the scope, validity and effectiveness of international norms in Brazil, aiming at their effectiveness in relation to human rights, it is necessary to highlight the landmark of the Federal Constitution of 1988, by breaking with the authoritarian regime, giving rights and guarantees extraordinary emphasis, placing them as the most advanced and comprehensive document on this matter

in the country's constitutional history.

Regarding the legal impact of international human rights treaties on Brazilian law and considering the constitutional nature of these rights, three

hypotheses may occur, and the law stated in the international treaty may:

- a) coincide with the right guaranteed by the Constitution (in this case the Constitution reproduces precepts of International Human Rights Law);
- b) integrate, complement and expand the universe of constitutionally provided rights;
- c) contravene a precept of domestic law.

In the first hypothesis, Brazilian law, particularly the Magna Carta, presents provisions that faithfully reproduce statements contained in international human rights treaties. As an example, we can cite the provision in article 5, item III, of the Federal Constitution of 1988, which, by providing that “no one shall be subjected to torture, nor to cruel, inhuman or degrading”, literally reproduces article V of the Universal Declaration of 1948, article 7 of the International Covenant on Civil and Political Rights.

In the second hypothesis, international human rights treaties will integrate, complement and extend the constitutional declaration of rights. From the ratification of international instruments by the Brazilian State, it is possible to list numerous rights that, although not provided for at the national level, are listed in these treaties and, thus, are incorporated into Brazilian Law. As an example, we can cite the right of every person to an adequate standard of living for himself and his family, including food, clothing and housing, pursuant to article 11 of the International Covenant on Economic, Social and Cultural Rights, the right of minorities ethnic, religious or linguistic people from having their own cultural life, teaching and practicing their own religion and using their own language pursuant to article 27 of the International Covenant on Civil and Political Rights and article 30 of the Convention on the Rights of the Child, prohibition of resettlement of the death penalty in the States that have abolished it, in accordance with Article 4 of the American Convention, among others.

¹¹ For JA Lindgren Alves: "With its adhesion to the two UN International Covenants, as well as to the São José Pact within the OAS scope, in 1992, and having previously ratified all significant international legal instruments on the matter, Brazil has already practically all the external formalities necessary for their integration into the international system for the protection of human rights. Internally, on the other hand, the guarantees to the broad rights enshrined in the 1988 Constitution, which cannot be amended and, also, extended to others arising from treaties of to which the country is a party, ensure the willingness of the Brazilian democratic State to fully comply with the international obligations it has contracted." (Human rights as a global theme, São Paulo, Editora Perspectiva and Fundação Alexandre de Gusmão, 1994, p. 108)

The list of rights set out in international treaties to which Brazil is a party is not exhaustive here, but only aims to point out, as an example, the rights that are enshrined in international instruments ratified by Brazil and that have been incorporated into the Brazilian domestic legal order. This makes it possible to ensure that International Human Rights Law innovates, extends and expands the universe of rights that are already constitutionally guaranteed.

The third hypothesis listed raises the question of how to resolve a possible conflict between the Constitution and a certain international treaty for the protection of human rights? The criterion to be adopted is guided by the choice of the norm most favorable to the victim, prevailing the norm most beneficial to the individual, holder of the right. The criterion or principle of applying the provision most favorable to victims is not only enshrined in the international treaties for the protection of human rights, but also finds support in the practice or jurisprudence of international supervisory bodies. The international rights contained in human rights treaties only improve and strengthen, never restrict or weaken, the degree of protection of rights enshrined in the constitutional normative plan. In his work that deals with human rights at the national and international levels, Antônio Augusto Cançado Trindade analyzes: "(...) we free ourselves from the shackles of the old and idle polemic between monists and dualists; in this field of protection, it is not a matter of primacy of international law or domestic law, here in constant interaction: the primacy is, in the present domain, of the norm that best protects, in each case, the enshrined rights of the human person, whether it is a norm of international law or of domestic law."¹²

In the human rights protection plan, international law and domestic law interact, driven by the same protection needs, prevailing the norms that best protect the human being, considering that the primacy belongs to the human person.

4 WORK AS A FUNDAMENTAL RIGHT IN THE PROMOTION OF HUMAN DIGNITY

In the Federal Constitution of 1988, work is one of the foundations of the Democratic State of Law (art. 1, IV) and adds in its art. 6 that "Education, health, work, housing, leisure, security, social security, maternity and childhood protection, assistance to the destitute, in the form of this Constitution, are social rights".

Once the right to work is considered a fundamental right, one has in mind the possibility of its holder to legally plead his interests, then protected, before the one who has the obligation to provide it. The fundamental right as a whole is a very complex object and is composed of elements with a well-defined structure, that is, the different positions of the citizen vis-à-vis the State, from which the relations of precision, the relations of means/end and the weighting relationships¹³.

¹² Trindade, Antônio Augusto C.. The protection of human rights at the national and international levels: Brazilian perspectives, San José de Costa Rica/Brasília, Inter-American Institute of Human Rights, 1992, p. 317-318

¹³ Cervo, Karina Social The fundamental right to work in the Federal Constitution of 1988 / Karina Social Cervo. 2008

However, the task of delimiting what would be the object protected by article 6 of our Constitution regarding the fundamental right to work is quite arduous. Alexy¹⁴ responds to this question by saying that, on the scale of possible interpretations, one can have everything from the utopian right to give everyone whatever work they want, wherever and whenever, to the compensatory right to receive help in the event of unemployment.

The right to work is a fundamental right as a whole, having as one of its aspects is the fact that it encompasses not only concrete legal relationships, but also a potentially protected legal relationship, since the public power has a duty to protect this fundamental right, including the person who finds himself in the situation of potential worker. The task of protecting this right is indeed difficult, mainly due to the fact that it is not always possible to dissociate the work provided from the dignity of the person who produces it.

As highlighted in art. 1, III of the Federal Constitution, the dignity of the human person is among the foundations of the Federative Republic of Brazil and this dignity is closely related to the principle of valuing work, according to article 170 of the same institute. The connection between the principle of human dignity and the rule that ensures the right to work shows that the one when human work does not obtain adequate appreciation is unattainable.¹⁵

5 CONCLUSION

Making a counterpoint to the critical theory of Herrera Flores, it is possible to perceive that human rights constitute a constant challenge in relation to their concretization and effectiveness. Based on the author, for the population to be able to exercise these rights in their entirety, it is necessary that they have material conditions to do so. (Herrera, 2009).

It is understood that the dignity of the human person must serve as a guide for other rights, however, considering the social inequalities existing in today's society, even if dignity serves as a beginning, social problems become obstacles, preventing this minimum is achieved and that other rights such as access to housing, work, the environment, citizenship, healthy food, leisure time, training, etc., reach these people. Thus, it is not enough for rights to be laid down in legislation. They lack concreteness.

Along with the dignity of the human person, the right to work emerges as a fundamental right for human beings. It is through it that the citizen achieves social recognition and acquires the economic capacity to access these necessary goods to, at least, guarantee their survival.

Faced with the constant transformations and new ways of society and globalization, Brazil, based on the ILO and on the guarantees arising from the Universal Declaration of Human Rights, inserted norms for the protection of workers in the national legislation and, through treaties and conventions signed, seeks

¹⁴ ALEXY, Robert. Theory of the fundamental rights. Madrid: Center for Political and Constitutional Studies, 2002

¹⁵ LEDUR, José Felipe. Realization of Labor Law. Porto Alegre: Sergio Antonio Fabris. 1998

to advance in the consolidation of the right to work, protecting the dignity of the individual, avoiding the exploitation of labor and the supremacy of economic power to the detriment of the human person.

In this way, the right to work is fundamental for the survival of the human being, it is not enough that the legal norms for the protection of work are institutionalized, since the State must prevent such rights from being violated, despite the legal provision. It must also

to consecrate the dignity of the human person, as well as to provide the necessary material conditions for individuals to exercise their rights, protecting the greater good that is human life.

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CHAPTER 56

Legal-digital communication in the context of COVID-19 and the visual law proposal

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ABSTRACT

The present work investigates the reflexes of the adoption of digital communication tools by the Law

operator during the Covid-19 pandemic, questioning itself: how does innovation affect the relationship between society and Law institutions? Moreover, it is proposed the adoption of the Visual Law tool, which makes technical information more understandable, meeting the demand of simplifying the legal language and promoting the right of access to Justice.

Keywords: Digital Communication, Law and Innovation, Covid-19, Justice System, Legal Language and Visual Law.

1 INTRODUCTION

The debate about innovation is not recent in Law, however, in the last decade, and especially since the beginning of the Covid-19 pandemic, in March 2020, the topic has been widely theorized; and the implementation of digital tools for remote work, public attendance through phone calls, e-mails, meetings in digital platforms, and other procedures that have the virtual environment as a space, has been accelerated.

Considering the exceptionality of the moment and the urgent measures adopted, this paper investigates the consequences of the adoption of Digital Communication tools by the Law operator, based on the question: How does innovation affect the relationship between Law and society?

In order to answer this question, this research analyzes the transformations related to information technology, through which the Justice System has gone through, resuming innovation milestones of the last decade, but having as main cut of time the Covid-19 pandemic, seeking to indicate from the bibliographic review and documentary research the resources adopted, that is, which digital communication tools became part of the daily life of the Justice System in this period.

In addition, it discusses how its implementation was carried out, which stages followed and what the transformations were since the adoption of the digital communication tools until the present moment, taking into account the strategies and processes of installation, adaptation and effectiveness of these tools in the Justice System.

This is a research that has been developed in the Professional Master's Degree in Law, at the State University of Ponta Grossa (UEPG), of qualitative nature, carrying out the bibliographic and documental review pertinent to the theme, including productions that discuss the Justice System, Innovation and Law, and the democratization of access to Justice institutions.

We tried to combine the classic readings of Administrative Law and Public Law with other more current publications, making use of the filters of research tools and banks such as Scielo, CAPES Periodicals, and Google Scholar.

Also, based on the translational perspective, also adopted by the Graduate Program at UEPG, the data and notes start mainly from the recent experience of adopting digital communication tools, and will extend in the monitoring of its activities performed remotely and in person in the period after the Covid-19 pandemic. This is characterized by an inductive research method, in which data from the professional practice in the Attorney General's Office of the State of Paraná (PGE/PR), the changes experienced, and observations made, lead to general propositions (RICHARDSON, 1999).

Also, the survey of information about the resources and paths adopted is done from academic and official publications, bulletins and other documents that have recorded the instruments chosen and the strategies put in place for the implementation of digital communication tools during the Covid-19 pandemic.

The organization of the Public Power is foreseen and guaranteed in the Constitution. Its adaptation to the virtual world was mainly due to the concern with the functioning of the public machine, in order to achieve the final services and functions, which often could not be provided without physical contact, this, which was limited by restrictive measures at the municipal, state and federal levels, since March 2020.

Currently, there are several demands that must be met daily and the expansion of the use of digital communication tools will be essential to improve the provision of services practiced by the Justice System.

In this work, which is part of the studies for the dissertation, the investigation of experiences in the use of digital communication will indicate if there are already standard procedures being adopted, or if it is necessary to look into its elaboration, understanding that its effectiveness depends on a professional and institutional investment of reinvention of the Justice System, which must follow the demands of its people and the characteristics of its time.

2 THE COVID-19 PANDEMIC AND THE INTENSIFICATION OF THE USE OF TECHNOLOGY IN THE JUSTICE SYSTEM

Within a year, the whole society had to adapt to a new reality with the measures of social isolation and distance; and since then, digital communication tools have been of great value, and information technology has been able to supply the most different demands, making it possible to maintain activities in different areas through the virtual environment.

In 2020 and 2021, the use of technology for communication purposes has been enhanced, since social distancing as a health protection measure has brought to light the difficulty of adapting to daily tasks without physical contact.

The virtualization and digitalization of processes and procedures, which have already been a reality since the last decade, were enhanced, and the role assumed by digital platforms as a communication

environment was fundamental for the population to access public services, realizing fundamental rights provided for in the Constitution (MILANI; CUNHA, 2021).

Examples of this transformation are found in the recent, and increasingly common, service through phone calls and e-mails; in the holding of meetings and gatherings based on platforms in virtual environments; in the intensive use of online messaging applications and cloud-based file-sharing software, as well as other procedures that have the virtual environment as their space.

If the transformations sustained in the advances of information technology are already reflected in the System of Justice Administration, it is intended that the present research, concerned with the implementation and improvement of digital communication tools that facilitate access to the organization, structure and legal language may contribute to the guarantee of the fundamental right of access to Law and Justice.

In this sense, in the field of Law and digital communication, debates are arising that seek appropriate ways to improve services, in view of the development of information technologies and tools that facilitate access, that promote dialogue, and that reduce costs and time invested by the Public Power.

One of the alternatives suggested is Visual Law, a transdisciplinary approach that combines Law, Design, and Technology to make legal language accessible to those who resort to it.

It is in the understanding that Law has been adopting and should expand, in the coming years, the use of information technology, that the innovative approach to the Justice System, its applicability and effectiveness is explored.

3 THE JUSTICE SYSTEM AND INNOVATION: THE MATURING OF THE RELATIONSHIP ARISING FROM COVID-19

It is considered a punctual aspect for the proposed analysis: the scope of the discussion understands the access to the Justice System, not only in its physical materiality, but also in its structure and organization, especially regarding the technical language widely adopted in Law.

The transformations resulting from the Covid-19 pandemic in the organization of the Justice System have provided an experience, and there are already evaluations about it (FARIAS, 2021; MILANI, CUNHA, 2021), that allows innovative proposals to take space and be implemented, with theoretical and practical accumulations of its operation, functionality, reception by operators and users of Law, and results.

In this scope, Administrative Law is understood as the administrator of public and social interests, which, under the light of the Constitution, architects the operation and structure of the State and its legal order (MOREIRA NETO, 2014).

Moreira Neto (2003) addressed the Administrative Law of the 21st century as an instrument for the realization of substantive democracy, and expressed his hope in the transformation of the configurations of social organization:

Thus it is that the expectation of 21st century democracy is not only to maintain and improve its formal aspect, of electoral suffrage, but also to add new forms of citizen participation in public choices, of innovation in the substantive aspect, with the establishment of conditions and axiological limits to give legitimacy to any of these choices - both of people and political actions - in both cases, under the mark of the growing submission of the exercise of politics to the law (MOREIRA NETO, 2003, p. 16 - emphasis added).

It is by following a theoretical path similar to that of the jurist, and proposing that society can make itself present in the spaces of Justice and access the structure, organization and legal language through new forms of participation, that this work intends to investigate how innovation has been reconfiguring the relationship between society and Law, and the reflexes of these transformations in the System of Justice Administration.

The ponderation between the benefits and weaknesses of the innovation discourse in the legal area has already been made by Mendonça (2017), the author indicates that it is necessary for institutions to advance without moving away from the real world.

When talking about Law and innovation, it is necessary to contextualize how and where the Justice System, its agents and the citizens who make use of it are located. A recent concept that has been debated in Brazil is that of smart cities. Smart cities are a phenomenon linked to urban organization in contemporary times, which is related to the insertion of people in the city space and its growing demand for adequate and effective services, whether in health, education, transportation, and also in Law (GUIMARÃES; XAVIER, 2016).

Of the common bases of smart cities, the triad stands out: attention to issues related to sustainability; intensive use of technology; and concern with human and social development, having in the coexistence in the city space the expression of collectivity (GUIMARÃES; XAVIER, 2016).

Considering, then, the reality and the demands of smart cities, the work is justified in the construction and defense of proposals for the adaptation of the Law, starting from the fundamentals that govern this new spatial configuration, which dialog with the concern presented in this work.

The growing use of digital communication tools, in the context of smart cities (GUIMARÃES; XAVIER, 2016) directs us to the adoption of these new approaches for serving the public and promoting access to Justice, in Law.

If this research was mainly in the theoretical field, it ended up being tested in advance in the context of the Covid-19 pandemic: in 2020 and 2021, restrictive measures such as isolation, social distancing, and lockdown adopted by several cities in the country potentiated the use of technology for communication purposes.

4 LAW, TECHNOLOGY AND LANGUAGE

In Law, several efforts have been made to keep the Public Power in operation and to update it: the remote work regime; the attendance via telephone and internet; and the realization of hearings and trial sessions through digital platforms have been configuring a new model of access to Justice (FARIAS, 2020).

It is possible to identify, since the beginning of the 21st century, innovations. There is the performance of the Judiciary: in 2004, the Creta system was created with the purpose of procedural follow-up; in 2009, this tool is developed with the Creta Expansion (CNJ, 2020). Still at that time, initiatives supported by the advancement of information technology arose "favoring the adoption of technological strategies that would allow the use of the software [Creta Expansion] in all court procedures in a configurable and flexible way, considering the peculiar characteristics of the procedural process of each branch of Justice" (CNJ, 2020, s/ p.).

In 2010, through technical cooperation agreement 43/2010 signed between the CNJ (National Council of Justice) and the State Courts of Justice, the Electronic Judicial Process (PJe) was created. Since then the system has been improved.

In addition, the Justice System already had other technological instruments, such as search tools and applications used for different purposes, among them communication.

This familiarity with information technology and digital communication even before the Covid-19 pandemic facilitated the transition necessary for the reorganization of work in this last period (FARIAS, 2020).

The technical knowledge and the constant use and improvement of these tools were fundamental for the continuity of the operation of the Justice System, as well as the maintenance of the provision of other public services, thus concretizing fundamental rights provided in the Constitution.

When addressing the transformations in the Justice System, one must consider that this is a path that has already been explored: technology is already present in Law, this reality was intensified in the years 2020 and 2021 and who knows, a key point of its theoretical and empirical investigation has been reached with the experience derived from the Covid-19 pandemic:

[...] The health of its staff was preserved, which was placed in a remote work regime, a model that was already very common in the Judiciary a few years ago and ended up becoming the predominant system during the pandemic.

All this concern to keep the Judiciary functioning during the pandemic, through the expanded use of digital tools that allow remote service, led to a clear reconfiguration of the model of access to justice (FARIAS, 2020, p. 100).

And being face to face with this new model, some considerations should be made: the first relates to the actual conditions of access to digital tools, i.e., the internet; and the second deals with the scope of the structure and organization, especially the legal language in relation to people who have, or will come into contact with Law.

According to the survey conducted in 2019 by the Regional Center for the Development of Studies on the Information Society, linked to the Internet Steering Committee in Brazil, at least 74% of the Brazilian population accessed the internet at least once in the 3 months prior to the survey. In this group, 90% reported accessing it daily (AGÊNCIA BRASIL, 2019).

As much as these data indicate an increase - according to the survey, of 3.3% per year since 2010 (AGÊNCIA BRASIL, 2019) - in the portion of the population that has access to the internet, the Judicial System cannot ignore that there are still representative 26% that could not count on digital tools in the service by the Judiciary.

The elderly population, for example, whose access to the Internet is somewhat distant, should be taken as an example. According to the survey "Elderly in Brazil: Experiences, Challenges and Expectations in Senior Age" (AGÊNCIA BRASIL, 2020), despite the increase in the number of people over 60 who said they knew about the term Internet (63% in 2006 and 81% in 2020), only 19% of the elderly make effective use of the network. The study also says that 72% of the elderly population has never used an application, and 62% have never used social networks. Thus, it is necessary to ensure the digital inclusion of this portion of the population, in order to realize the fundamental right of access to justice, as also provided by the Elderly Statute.

Thus, it is noteworthy that the research that has been discussing the remote services and the use of the internet by the Justice System during the Covid-19 Pandemic (FARIAS, 2020; and MILANI; CUNHA, 2021) do not annul the continuity of face-to-face services, nor does this work.

Digital communication should be adopted in those cases where it is feasible and beneficial to Law and Society, not limiting the continuity of public service and provision of in-person services, considering the lack of conditions to access the internet for part of the population. As Mendonça (2017) argues, innovation must go hand in hand with reality.

The second aspect highlighted refers to the scope of the structure and organization of the Justice System, with emphasis on the technical language adopted in the legal field, in relation to the people who have, or will come to have contact with Law.

This debate has been carried out by the most diverse areas of knowledge, whether in the Philosophy of Law, or in Sociology and Legal Anthropology; here, the topic is approached from the understanding of access to Law as a human right to understanding, and subsequently, dialogue is established with the fields of Language, Design, and Technology in the search for effective communication.

Democratic states must guarantee access to law and justice. This is expressed constitutionally in item XXXV of Article 5 of the Federal Constitution of 1988; and also in other guiding documents of substantive democracy, such as the Universal Declaration of Human Rights, of 1948; the Convention for the Protection of Human Rights and Fundamental Freedoms, of 1950; and the World Charter of the Right to the City, more recent, of 2005.

We have tried to discuss the current reality and new possibilities of access to the physical materiality of the Law, by means of the effective assistance and applicable procedures. We will now consider the obstacles that, even after accessing the Justice System, the person who seeks legal support may face.

If, on one hand, the visible face of the law are the legal norms, on the other hand, the meanings that run through them are embedded with invisible meanings; in the space of the court, the rituals create the boundaries of space, transforming the ordinary into the extraordinary; for those who can perceive the meaning/significance there is the possibility of access, while others must continue on the 'other side of the line', which separates the accessible from the inaccessible; for the trained ear, the sound of law is quite (or at least relatively) harmonious, for those who do not understand its discourse there is the sound barrier, which gives way either to silence or noise (BRANCO, 2008, p. 7).

This silence is the incomprehension, the noise, the partial understanding. And if the communication barrier prevents full access, either to legal norms or to legal language (BRANCO, 2008), it is necessary to investigate where the limitations are and circumvent them in a propositional way.

In December 2019, the results of the "Study of the Image of the Brazilian Judiciary" were published, conducted by the Institute for Social, Political and Economic Research (IPESPE, 2019), in partnership with the Association of Brazilian Magistrates and the Getúlio Vargas Foundation.

Among the most perceived problems, the survey addresses the negative concepts about the Judiciary and indicates that, for 69% of the population, justice does not have a modern functioning; added to this is the perception that the legal language is barely understandable for 87% of the population (IPESPE, 2019).

Legal formalism is characterized by the exacerbated use of "archaisms, bureaucratic terms, hyper-specialization of terms, excessive remissions" (SLAIBI, 2017) and adopts an unobjective style.

Proposals to simplify legal language have been made by law researchers (BRANCO, 2008; RODRIGUEZ, 2015; SLAIBI, 2017; GUIMARÃES, 2019) under the argument that "law and its operators do not speak only for themselves. They speak for a wider audience, society. And therefore, it is a public language that should be accessible to all" (GUIMARÃES, 2019, p. 32-33).

One of the possibilities that technological advances and the interdisciplinarity of Law presents us with is Visual Law, a tool aimed at simplifying jargon and legal language, which seeks communicative effectiveness and efficiency between society and the Justice System.

5 VISUAL LAW: AN INNOVATIVE PROPOSAL

The transformations in the Justice Administration System driven by innovation promote greater access to the institutions and language of Law.

The transdisciplinary approach finds support in other areas of knowledge to improve legal practices, following some paths more familiar to Legal Sciences, in the intersection with Language, for example; and others of recent approach, by proposing dialogue with Technology and Design.

In this context, there is a tool that makes it possible to make legal information and procedures more understandable and intuitive. This tool, which has been called Visual Law and has recently entered the debates on Law and innovation in Brazil, is based on three axes: Design, Technology, and Law (HAGAN, 2017).

Design would make information more attractive and understandable; technology would make people's actions occur more effectively; and Law would be responsible for promoting a fairer society and empowering people. At the intersection of these elements is Visual Law (HAGAN, 2017).

For Hagan (2017), Law, and any other legal dealings, should adopt the tool to the extent that they communicate complex concepts, produce technical [written and oral] texts, and, as other scholars have pointed out: legal discourse needs to be accessible, with the meaning received by the one listening or reading Law matters being the same as the one that was intended to be produced.

There are different instruments and methodologies that this tool uses to make legal language accessible to society: images, charts, flowcharts, key words, glossary, comparisons, metaphors, summaries, reinforcement questions and highlights are examples that illustrate its communicability potential.

The application of Visual Law is not limited to virtual environments, so it can be adopted by the Justice System widely, in the medium - in person or virtual - as it best suits it.

And if, especially during the years 2020 and 2021, virtual environments and digital communication tools have already been developed and incorporated into daily life, the extension of this use must occur, improving it and seeking to diagnose where its weaknesses lie.

We resume what is proposed by Mendonça (2017), who indicates that innovation in Law follows a dynamic of progress and regression. Therefore, innovative means and forms should be tested, measured, revisited, and regulated as their applicability and effectiveness are presented to the Justice System.

6 FINAL CONSIDERATIONS

The present study has as its research problem the reflexes of the adoption of digital communication tools by the Law operator and asks: how does innovation affect the relationship between society and Law institutions?

The pandemic context has enhanced the use of digital communication tools in Law. What was already being done slowly, was accelerated with the restrictive measures enacted throughout the country, and the online work was adopted by Law agents, involving from their office work, which began to be done at home, or in a system of interspersed work; to the holding of meetings and attending to the public, which took place remotely. This transformation allows the impacts on the daily life of both the Justice System and the citizens who seek this service to be measured.

Through investigations already done by other authors it was possible to identify the adoption of meeting platforms and meetings in a virtual environment, online message exchange applications and cloud-based file sharing software.

This implementation occurred gradually, and was guided by local and regional demands and possibilities; a protocol that aims at its maintenance or continuity after the pandemic has not yet been established.

Thus, it is indicated the need to systematize the work from these new environments, which make use of the digital communication tools mentioned above; as well as local and regional evaluations that gather data on demand, access to the Internet and other technologies, the effectiveness of services already provided remotely and virtually, and qualitative information about the need to maintain face-to-face activities.

With the consolidation of these practices, the development and investment of time and budget in technologies that can further improve service and seek to guarantee society's constitutional right of access to justice, the discussion about legal language also allows alternatives to the technical and not very understandable discourse of Law to be proposed, one of which is Visual Law.

This tool, which has recently appeared in the field of Law studies and Brazilian Innovation, is capable of simplifying legal information and procedures that, for those who are familiar with them, are everyday; but that are received with strangeness and difficulty of understanding by people who are not directly involved or have little contact with legal language.

Furthermore, the broad use of Visual Law by Law operators meets the expectation of modernizing justice, through the transdisciplinary approach and communicative potential.

Finally, it is considered that, through the complementary adoption of digital communication and the maintenance of face-to-face services, to the extent of the limitations of internet use by the population; and the implementation of the Visual Law tool; or similar communication strategies, legal services and communication become more effective.

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CHAPTER 57

Nursing care to women who have experienced fetal death: literature review

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ABSTRACT

The death of a baby still in the maternal uterus reverses the logic that people are born, age and die. In this sense, the adequate treatment from a nurse to the pregnant woman is extremely important due to the fact

that the process of the human existence pass through inversions. In this present study, it was made a review from an integrative literature in order to analyze the main causes of fetal deaths and the care of the nurse to women who experienced the fetal death based on the published scientific literature. The search of the texts was made in the Portal of the Virtual Health Library (VHL). Scientific texts published in Portuguese, full texts, full texts online and with relevant topics to the research from the past 10 years were included. It was resulted in 10 texts. It is concluded that the most part of the fetal deaths occurred without a defined cause and it could be prevented through adequate care provided to women during pregnancy. The nurse feels limited to provide an adequate care to women who experience the fetal loss but demanding more sensitivity in more empathetic relationships in the care of these women.

Keywords: Fetal Death, Nurse, Caring in Nursing.

1 INTRODUCTION

In order to understand the concept of fetal death, the World Health Organization (WHO) defines the term as death prior to complete expulsion or extraction of a product of conception from the mother's body, regardless of the duration of pregnancy. This condition is evidenced by the following parameters: absence of breathing, as well as absence of fetal heartbeat, pulsation of the umbilical cord, and effective movements of involuntary contraction muscles (MIRANDA, ZANGÃO, 2020).

Fetal Death (FO) can occur early in fetuses weighing 500g, 22 completed weeks of gestation or more. Late Fetal Death can occur in fetuses weighing 1,000g at 28 completed weeks of gestation or more. Gestational loss below 22 weeks is considered by the International Classification of Diseases (ICD) as miscarriage (SUN et al., 2019).

Studies point out that 50% of the causes of Fetal Death are associated with maternal infections in pregnancy, maternal diseases including syphilis, diabetes and hypertension, placental complications and fetal growth restriction. The other 50% of cases are due to unknown causes and

often cannot be attributed to maternal, fetal or obstetric causes. Thus, the dimensioning of the current context is scarce due to information deficit in underreporting (MENEZZI et al., 2016).

Regardless of the type of fetal death, Ordinance No. 72 of January 11, 2010 of the Ministry of Health (2010) establishes the mandatory completion of all fields of the death declaration filled out properly.

Epidemiological studies become relevant for a greater understanding of the problem exposing the need for preventive measures in order to reduce the number of cases. The total occurrence of investigated deaths with informed summary form, investigated death without informed summary form and deaths not investigated according to the duration of pregnancy, in the state of São Paulo, 2019 (BRASIL, 2019).

The table below presents the total number of deaths in the state of São Paulo, indicates with higher prevalence deaths with gestation duration between 22 and 27 weeks.

Table - Epidemiology of fetal deaths in the state of São Paulo, 2019.

Gestation Length	Death investigated, with summary sheet reported	Death investigated, no summary sheet reported	Uninvestigated death	Total
Total	3.379	93	1.613	5.085
Less than 22 weeks	225	6	155	386
22 a 27 weeks	865	31	522	1.418
22 a 27 weeks	537	19	282	838
32 a 36 weeks	835	19	299	1.153
37 a 41 weeks	717	11	145	873
42 weeks and longer	2	-	1	3
Ignorado	198	7	209	414

Source: DATASUS. Mortality - Brazil. Ministry of Health, 2019.

Within this problematic, the Obstetric Nurse is responsible for the full care of the pregnant woman from her first stage to the last weeks before delivery. During this process, the nurse must provide care and guidance to the pregnant woman and her family, from adverse events that may occur during this process and prepare them for birth (BOBAK, PERRY, LOWDERMILK et al., 2002).

The death of a baby still in the mother's womb inverts the logic that people are born, grow old, and die, configuring itself in a very peculiar psychic elaboration work due to people's usual representations. For the parents and families involved, the rupture of life usually generates profound effects, and the non-appreciation of the whole context can lead to significant losses for the bereaved (SCHMALFUS et al., 2018).

In this sense, it becomes extremely important the proper care of the Nurse to the pregnant woman since the process of human existence goes through reversal. For this, the Nurse must obtain scientific and humanized knowledge of how to provide effective care in the physical, emotional and social context, empathizing with the woman and her family, offering care, support and guidance ((BOBAK, PERRY, LOWDERMILK et al., 2002).

In the Research Priority Agenda of the Ministry of Health (APPMS), it has 14 Axes and is concretized through nuances, epidemiological data, and with the support of all the health secretariats. Axis 10 - Women's Health or Axis 14 - Maternal and Child Health do not specify research on abortion or fetal death. However, there is an exception made in Axis 13 - Indigenous Health, 13.14 - Evaluation of birth and death records in indigenous communities and development of tools to improve the coverage of these records in Brazil (BRASIL, 2018).

Despite this, it is understood that the Nurse should seek more knowledge to guide the care provided to the family experiencing fetal death.

Thus, the theme of this study was thus established as of utmost importance in the development of research with the aim of improving health services and the care provided to women.

The guiding questions of this study are: what are the main challenges faced by nurses when caring for women who have experienced a fetal death and how should nurses care for these women?

This study aims to contribute to the production of scientific knowledge about caring for women who suffer fetal death and to redirect practices in order to improve the quality of care provided by nurses.

2 OBJECTIVE

To analyze, based on published scientific literature, the main causes of fetal deaths and the care provided by nurses to women who have experienced a fetal death.

3 THE CARE IN NURSING

The nurse is the professional responsible for various forms of care and according to a hospitalized client:

It is individualized care aimed at rescuing the aspects that are hidden by hospitalization. It is one of the most sublime jobs among all professions, because we are all, at any moment of our lives, a potential client. It is an action that produces care through frequent interaction with the client, respecting his or her right to question this care and to express an opinion about it. It is also any nursing action that aims at well-being and health. Caring implies several technical and informative activities to the client and the family, it is to implement nursing actions to meet all the needs of the client and his family. It is to contribute to the client's recovery of balance and homeostasis. Providing care is a daily challenge, it is the art of caring with much love,

help, understanding, dedication, and presence, contributing to the development of science. It is the permanent reminder that the client is not just a problem/illness". (COELHO, 2006; p. 2).

The client's expression and what is said by him/her is connected to what he/she is feeling, allowing the nurse to draw specific and efficient care plans. In the same way, this professional can use the technique of caring through gestures and words, generating emotional support to the client, seeking the exteriorization of feelings and needs. (COELHO, 2006).

4 THE DEATH AND DYING

According to Afonso and Minayo (2013), the theoretical framework of Elisabeth Kubler-Ross on death and dying, title of one of her books, describes the five stages of death by which people went through in a life-threatening situation: denial, anger, bargaining, depression and acceptance. Kluber-Ross' studies, described the relationships that involve the staff, the patients and the families, understanding that only theoretical knowledge was not enough, it was necessary to work with "heart and soul".

The five identified stages that a patient may experience during the period of grief or their terminality. Denial may be temporary and a defense, anger where feelings of anger and resentment arise and may be accompanied by questioning of "why me?", bargaining usually made with God or associated with contained guilt, depression where the feeling of sadness allied with another feeling becomes prolonged, and acceptance the one where the patient starts to accept the facts (SUSAKI et al., 2006).

Kluber-Ross' life story still according to these authors reveals that she was a Swiss-American psychiatrist, had a very low birth weight, being one among triplets, with the ideal of proving that she deserved to be alive. She also experienced World War II, working in Poland and Russia, with first aid care, starting her interest in the theme of death and dying (AFONSO, MINAYO, 2013).

5 MATERIAL AND METHODS

This study is an Integrative Literature Review. The Integrative Literature Review is a method that aims to synthesize research results on a given topic in a systematic way. It is called integrative because it provides broader information on a subject and/or problem forming a body of knowledge (ERCOLE, et al., 2014).

The Virtual Health Library (VHL) is the main channel of access to the research titles of the Ministry of Health (MH), besides being one of the main responsible for conveying scientific studies available in full and dissemination of bibliographic information produced by the Ministry of Health.

The purpose of the VHL is to gather, organize and disseminate information, making it accessible to health professionals, citizens in general and governments (VHL, 2021).

Through the site, a large collection is maintained with complete texts for research, digital books, primers, manuals, among others. In addition to possible access to international data such as Medical Literature Analysis and Retrieval System Online (MEDLINE) and Latin American and Caribbean Literature on Health Sciences (LILACS), which are bibliographic references of scientific documents focused on health.

To carry out this study, we used six steps indicated for the organization of reviews: 1- The elaboration of the research question; 2- the inclusion criteria of studies and sample selection; 3- data collection; 4- critical analysis of the studies, comparing the differences and conflicts between them; 5- analysis and interpretation of results and 6- presentation of the review, in a clear, evidenced and related way (MENDES, SILVEIRA, GALVÃO, 2008).

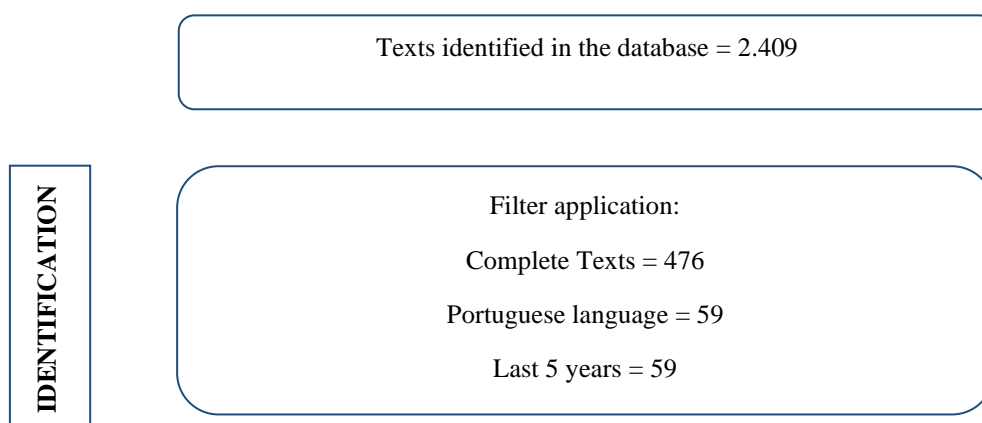
The following Descriptors in Health Sciences (DeCS) were used: Fetal Death, Nursing Care, Feelings and Emotions with the Boolean operator AND.

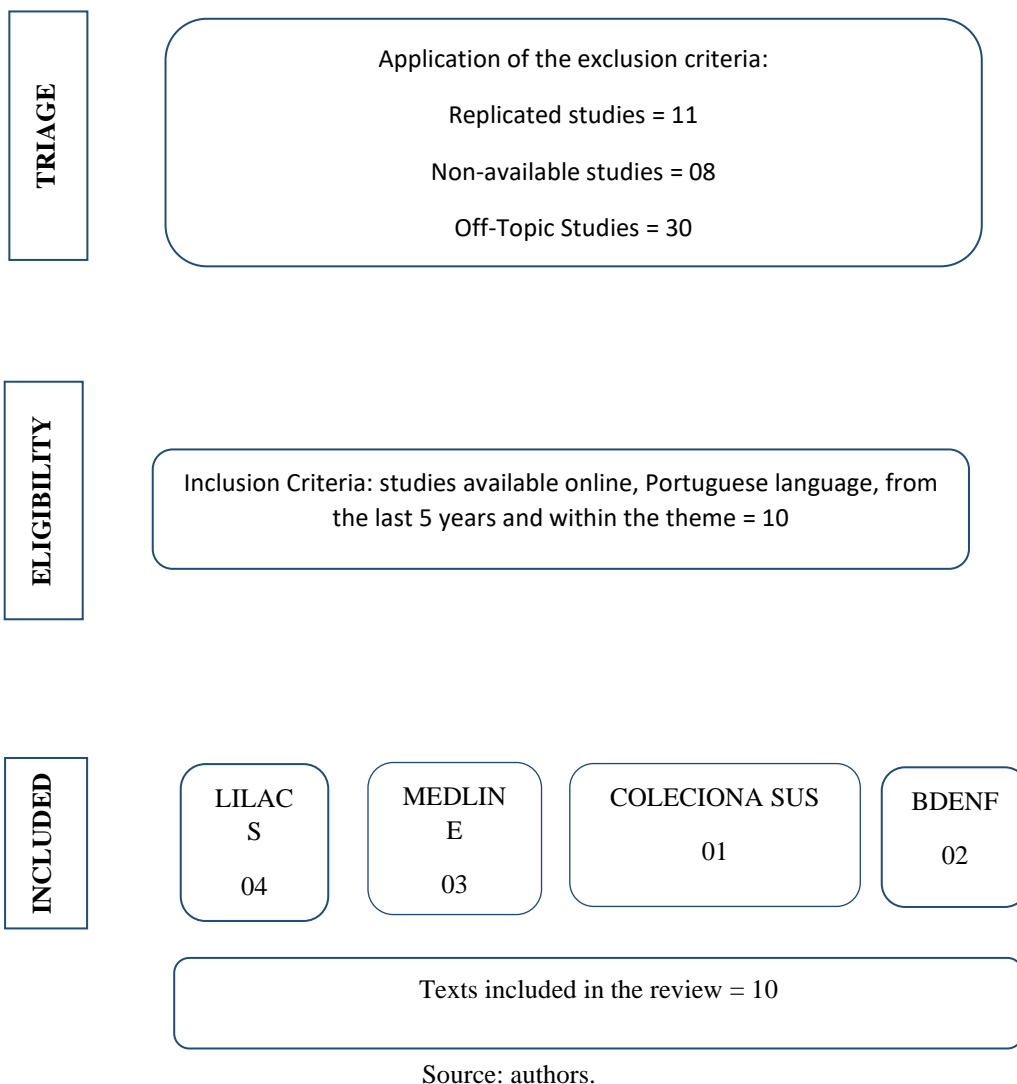
Inclusion criteria for text selection were: publications in the last 10 years, studies in Portuguese, texts with themes relevant to the research. Exclusion criteria were publications longer than the stipulated period, studies in other languages, integrative review studies, and repeated studies.

The data collection period occurred in August 2021.

We identified 2,409 publications, but 10 texts were selected because they fit the inclusion criteria. To analyze the texts, a data collection instrument was developed with the following variables: title of the article, authors' names, database, journals published, year of publication and main results, Figure below.

Figure - Flowchart of the text selection search method.





Source: authors.

6 RESULTS AND DISCUSSION

The 10 texts selected for analysis in this study were listed in the **chart** below.

Chart - Distribution of the texts according to the title of the work, authors' names, database, journal published, year of publication and main results.

N.	Title of the texts	Authors	Database	Journal	Main results
01	Avoidability of fetal deaths: Reflections on the Brazilian list of causes avoidable by single health system interventions.	Fonseca <i>et al.</i> , 2021	MEDLINE	Public Health Journal	Ineffective identification of the causes of fetal deaths, under-resourced prenatal consultation, and deficits in completing the Death Declaration.
02	Factors associated with mortality from nonspecific and poorly defined causes in	Baleiro <i>et al.</i> , 2020	MEDLINE	Science and Collective Health	Mortality from ill-defined causes is associated with spatial and temporal

	Amazonas State, Brazil, from 2006 to 2012.				dimensions, demographic and socioeconomic factors, and the assistance provided at the time of death.
03	Women in fetal loss: nursing care limitations.	Schmalfu ss, Matsue, Ferraz., 2019	BDEF	Brazilian Journal of Nursing	To identify the limitations related to the nurse's assistance involving feelings of insecurity and helplessness, inappropriate attitudes with the women.
04	Avoidability of infant and foetal death: dialogue between the committee and primary health care.	Ferreira <i>et al.</i> , 2019	LILACS	Portal of Nursing Journals	It evidenced the implementation and organization of technical groups to review conducts and work process and propose improvements in assistance during prenatal care.
05	Maternal age and perinatal outcomes in high-risk pregnancy.	Almeida <i>et al.</i> , 2018	BDEF	Nursing Journal	The study identified prematurity related to advanced age at gestation.
06	Perinatal deaths preventable by interventions of the Brazilian Unified Health System.	Rego <i>et al.</i> , 2018	LILACS	Gaúcha Nursing Journal	It showed as the main causes of fetal deaths: fetus and newborn affected by maternal affection and asphyxia/hypoxia or being born.
07	Hospitalizations for obstetric complications during pregnancy and maternal and perinatal outcomes in a cohort of pregnant women in the Unified Health System in the city of São Paulo, Brazil.	Moura <i>et al.</i> , 2018	LILACS	Public Health Journal	It identified a higher rate of hospitalization for obstetric complications of pregnancy in women with infectious diseases, diabetes and hypertension, older than 35 years, and low education.
08	The process of analyzing the avoidability of infant and foetal deaths: a single case study.	Ruoff, Andrade, Piccoli, 2018	LILACS	Texto Contexto Enf	The factors that contribute to the occurrence of infant and foetal death and the situations that trigger the deaths synthesize the process of death case analysis from the perspective of avoidability.

09	Surveillance of fetal death: study of the main causes.	Menezzi et al. , 2016	MEDLINE	The World of Health	It was observed that among pregnant women between the ages of 18 and 29, the causes of death did not present any associated risk factor.
10	Synthesis of evidence for health policies: reducing perinatal mortality.	Barreto, Souza e Chapman , 2013	COLECIO NA SUS	Brazil	Describes the development of techniques for reducing fetal and perinatal deaths in the public health service.

Source: authors.

The survey of possible causes of fetal death allowed the observation of a possible weakness in the health system, as well as in the assistance provided by the team, related as the main complaint the difficulty of access to health services, treatment and nursing consultations (RUOFF, et al., 2018).

Some of the factors that may contribute to the occurrence of fetal death are the biological factors that can be analyzed through data contained in medical records and examinations, in relation to the care of pregnant women, information is sought in the home environment, considering maternal self-care and the woman's desire to become pregnant and socioeconomic factors that are analyzed social indicators such as maternal age, education, economic status and housing (RUOFF, et al., 2018).

The frequencies of fetal deaths indicate higher incidence in pregnant women under the age of 30 years. Most deaths occurred mainly after 37 weeks of gestation and in most cases no associated risk factor was identified by the health care team. Among the multiple gestational interurrences there was relative difficulty in determining the specific cause of death (MENEZZI, et al., 2016).

The most frequent causes of obstetric complications that made hospitalization necessary for these women were: infections, hypertensive diseases, diabetes mellitus and hemorrhages. Being more common among mothers over 35 years and with multiple pregnancies (MOURA, et al., 2018).

Analyses with regard to fetal death showed common characteristics, mothers aged between 20 and 34 years who maintained more than 8 years of schooling, being the vaginal route the main type of delivery (REGO, et al., 2018).

Studies indicate that large differences in maternal age should be considered as a risk index. Adolescents and women considered of advanced age for pregnancy are more vulnerable to complications and unfavorable pregnancy outcomes. Adolescent mothers indicate higher rates of identifying the need for immediate treatment or intervention after birth, as well as mothers over the age of 35 are more susceptible to having premature children (ALMEIDA, et al., 2018).

Studies indicate that if the woman who experiences a fetal death receives adequate care from the health team at that moment, aiming at qualified care in both the physical and mental areas, it helps in the grieving process, making it lighter to face diversity. To this end, the professionals who work in direct obstetric care to women are included. Among them highlights the role of nurses, who do not always feel prepared or comfortable to provide such assistance, also evidenced that these professionals feel insecure about the best form of care, added to the lack of strategic knowledge, skills and resources (SCHMALFUSS, et al 2019).

Thus, although nurses value all the emotional support provided to mothers going through this loss, studies indicate that to qualify the assistance provided they should: adapt the curriculum, always be updating with courses and evidence-based training; create nursing protocols; keep the technique related to clear and effective communication updated; provide individual assistance to each woman; provide humanized care in labor; make use of all available structure in the health service, as well as all support networks.

They also recommend that to provide adequate care in a situation of fetal loss all staff should, show deep respect to the woman and the whole family, provide information in an objective, supportive and calm way, provide the creation of memories if possible let the parents hold the baby, bathe, talk and participate in ceremonies and consider mourning as a process of life and not with professional failure (SCHMALFUSS, et al 2019).

The fetal death can generate numerous emotional impacts to all, family, professionals involved and, from this, each individual goes through a process of acceptance / differentiated grief, however, the assistance taken tends to get a standard for all, in view of their exposure to a delicate situation and vulnerability (SCHMALFUSS, et al., 2018).

In order to reduce the mortality rates, each municipality maintains Epidemiological Surveillance professionals who are responsible for investigating cases of death. The investigation process is done through the death declaration (DO), followed by an investigation through the woman's medical records, analyzing all interventions during the pregnancy. The epidemiological surveillance professionals can also conduct home visits in order to reconstitute with the family the facts that led to the death. After the survey of the problem, it is suggested that there is a discussion with the multidisciplinary team so that similar cases do not occur again (FERREIRA, et al 2019).

Thus, the Ministry of Health, ORDINANCE No. 1.459, OF JUNE 24, 2011, established, within the Unified Health System (SUS), the Stork Network, aiming not only to provide services to the development of the child, but also aiming to provide services to the fetal death, ensuring reception and resoluteness facing the woman during this process (BRAZIL, 2011).

Given this, it is evident the need for assistance to both the professional nurse and the patient, since the patient tends to cause feelings of insecurity, pity, discomfort, and feelings of inability about her care. From the moment the patient is exposed to such vulnerability, it may cause doubts about the efficiency of the care itself. In this circumstance, the professional preparation based on evidence is of mere importance for both the care provider and the receiver, and consequently, bringing comfort and confidence to all involved (FERREIRA, et al., 2019).

In order to meet such challenges the professional must provide adequate support, ensure evidence-based and updated qualification, humanized care adopting individualized measures according to the needs of each patient, promote appropriate and comfortable environment and images for the moment and supply the woman's knowledge about the existing support networks (SCHMALFUSS, et al., 2018).

7 FINAL CONSIDERATIONS

This study reached its objective by analyzing, based on published scientific literature, the main causes of fetal deaths and the care provided by nurses to women who experienced a fetal death.

It was possible to verify that the causes of deaths are sometimes not identified due to relevant factors such as the mother's age, related pathologies and the adequate health care provided to the woman. Assisting a woman in the process of fetal loss still represents a great challenge for nurses, due to difficulties generated by lack of resources, lack of skills, technical and scientific knowledge, lack of emotional support, which can result in harmful assistance to the woman and lack of humanization in care.

It is suggested that new studies related to the theme be conducted, since it is extremely important to recognize the demand for increased access and quality of care to ensure promotion, prevention, treatment, specific and timely care to all women users of the public health service..

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CHAPTER 58

Strategic management of people in the business plan

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ABSTRACT

This article aims to show the benefits of deploying strategic management of people into car. To reach those goals several tools used in this system were studied and the most effective ones were selected. For a better understanding, its concepts and benefits were also considered when deployed. By the end of the study a survey was carried out and applied at three car dealership places in Londrina. After that a data analysis was performed and it was followed by a discussion. Through this analysis it was stated that the deployment process for strategic management of people into car dealership places in Londrina is still a slightly evolved issue and it needs some changes.

Keywords: Strategic Management of People, Car Dealership Places, Talents, Tools to Strategic Management of People, Benefits of Deployment.

1 INTRODUCTION

Over time, companies have faced and continue to face major changes. Changes in their structure, size, scope in their area of operation, among many others. We can consider that today, all companies that want to be successful in their field, must invest in the company's main capital, a capital that not long ago was forgotten within an organization and is simply the most important one, because it influences the entire result of its production. We can call this capital intellectual, which is represented in companies by the talent of their employees.

Although scholars have been talking for some time about the importance of companies investing in this area, many of them have not yet managed to see that their future depends entirely on the amount of talent they manage to retain on their staff. Despite being a minority, as early as 1998 through research conducted by McKinsey consulting, it was found that many executives and several large companies were already aware that attracting and retaining talent was the companies' main challenge. The question is: What measures do companies need to take to retain talents?

Strategic People Management comes to answer the above question. Of course it's not an easy procedure to implement, it depends on many factors and they all have to be in perfect harmony. For DUTRA (2002) people management is "a set of policies and practices that allow the conciliation of expectations between the organization and the people so that both can accomplish them over time". Therefore, after the correct implementation of Strategic People Management, the company will have competent employees working happily, and as a consequence, it will be able to achieve its goals and results, obtaining profit.

The objective of this article is to present to the reader the importance of the implementation of the Strategic People Management process in companies, based on successful cases of its implementation and presenting in a simplified way the benefits that this process can bring if applied in the Peugeot Ópera car dealership in the city of Londrina, in the state of Paraná.

2 CONCEPTS OF STRATEGIC PEOPLE MANAGEMENT

People management is a managerial function that aims to unite the interests of the employer with those of the employees, providing a balance between the parties and thus achieving the result that the company seeks and the recognition that the employees want. The management of people comes to consider employees as talents with the goal of giving their best, realizing themselves personally and collaborating with the results of the organizations.

The concept of People Management is a new term that appeared at the end of the 20th century. It originated in Human Resource Management, which over the years is no longer being adopted. Scholars adept at the term People Management argue that this term comes to present that the people

of a company are not just employees, but partners who work together with the company seeking to meet its goals. The term Human Resource Management has been losing strength, because it is a term that presents people as something very restricted, without variables, such as a material good or a financial resource. Strategic People Management aims to adopt this new way of viewing the people who work in a company, applying this concept strategically, joining effective tools and deploying them in such a way that all of them seem to be just one, and, if applied correctly, the result can be even better than expected.

As tools, the Strategic People Management has several. In this article some of them will be discussed, but they are the ones that bring more results to the company and satisfaction to the people who work in partnership with it.

The Strategic People Management must be divided into some subsystems, which are nothing more than the detailing of the tools that will be worked on during this work and presenting what each one is responsible for. Details of these subsystems are shown below:

HR Provision Subsystem: is the responsible for the correct hiring, HR planning, the presentation and integration of new professionals and also the termination interview;

HR Application Subsystem: it is responsible for the administration of the positions and the functions performed by them. This system is also responsible for evaluating the professionals' performance;

HR Maintenance Subsystem: responsible for keeping the good professionals in the company, taking care of remuneration, benefits, hygiene and safety at work, etc;

HR Development Subsystem: responsible for the development of professionals, providing training for personal and organizational development; and

HR Monitoring Subsystem: it is the one responsible for knowing what people do in the organization, trying to analyze the results obtained from each individual. It is also responsible for verifying if the actions of the Strategic People Management are being implemented in a correct way, carrying out HR audit procedures..

3 BENEFITS OF IMPLEMENTING STRATEGIC PEOPLE MANAGEMENT

For the company to be able to see the benefits provided by Strategic People Management, it needs to break some paradigms and open its vision to a new horizon. A company will only invest in this method from the moment it recognizes what people represent to it. People in a company represent the competitive differential, because they are the ones who promote and maintain organizational success. Thinking this way, the old idea that "the focus is only on the client" is eliminated, the

professional who is collaborating with the company's growth is promoted, and it is seen that for satisfaction to reach the client, it must first go through the organization's employees.

The employees become engaged when they feel valued. When they understand the organization's objectives and feel they are a fundamental part in achieving them. They feel valuable when they are involved in the organization's decisions, and through their ideas and performance they can see the organizational and personal growth, and, mainly, when they are rewarded for their effort and contribution to reach the established goals.

Thinking this way, for the customers to be well served and for the company to achieve its goals, the focus becomes the interests and feelings of the people who work in the organization, the well being of the people, the motivation of each one of them. The organization's people should stop being analyzed as resources and should be analyzed as partners; this will make all the difference in the organization and its results. When a company recognizes that its professionals are not resources, it no longer has a specialized workforce, but talent with intelligence. Employees stop seeing norms and procedures and aim only at the result, stop isolating themselves and create work teams.

When the organization recognizes its employees with these conditions, it enables its leaders to do a job effectively, coordinating their team and getting the best possible performance out of it. The leader will work as a coach, providing growth to his employees, establishing the company's vision, giving and receiving constant feedback. The leader must attract the professional, develop him/her, accompany him/her, keep him/her, and recognize the effort he/she is making to reach the objectives. In this way, the leader will find it easier to keep a good professional in his team and control the climate in his department, making it favorable for his employees.

Chiavenato (1999) comes to talk about the organization's partners, attributing who the partners are, what they offer for it, and what they expect as a reward for this effort expended. The shareholders, by offering their capital and investments, expect profit and dividends. Employees, by offering their effort, knowledge and skills, expect wages, benefits, recognition and satisfaction. Suppliers, by offering raw materials, technologies, and services, expect profits and new business. Customers, in buying the products and services, expect good service, quality, and price. "Each partner continues to invest resources as they receive satisfactory returns and results." (Chiavenato, 1999 p. 06).

In short, it is considered that the benefits of the implementation of this system can achieve unimaginable results, everything will depend on the amount of talent that will be awakened within the professionals of the company.

4 POSITION PLAN

In this work, the implementation of the position plan will be the basis for a successful compensation strategy and competency-based management. It presents to the employees the way they should act so that they have the possibility of internal growth.

The position plan is nothing more than a detailed description of the duties of each position. For its effective implementation, in the first instance, a survey of the existing functions in the concessionaire will be carried out, and after this, the attributions of each function will be specified.

As a basis for career development, the network structure system will be used, thus enabling professional growth in the department itself or migrating to other departments, so that this migration occurs effectively, this will be accompanied by the management by competencies.

5 REMUNERATION STRATEGY

Strategic remuneration means valuing the employee and not the function he or she performs. It gives him the possibility to achieve a higher remuneration even without changing function, this is possible by the results obtained by his professional performance. As a result of this, the company has a partner by its side who will give all his strength to achieve the organization's goals, because in this way he will also achieve his own, thus bringing the result expected by the company.

When an organization chooses to adopt strategic remuneration, it removes several limitations of traditional compensation plans, such as those mentioned below:

Inflexibility by treating different situations homogeneously, not considering peculiarities of the companies;

False objectivity by appearing to have a rationality, thus hiding a reductionist view of the organizational reality;

Outdated methodology;

Conservatism by preserving hierarchy and reinforcing the bureaucratic structure;

Anachronism by holding back the development process in companies;

Divergence, because with a casted vision of compensation, organizations cannot get the most out of their employees to achieve the desired goals.

The strategic remuneration system has some essential components for its operation, which are listed below for a better understanding:

Functional compensation comes to determine a salary according to the function and the market;

The indirect wage, which includes benefits and other advantages;

The skill-based compensation that is determined by the training and education of employees;

Variable pay, which is determined by the performance of the individual, the team or even the organization itself;

Stock ownership, which will be determined by the company's profitability goals that have been achieved; and

Creative alternatives, which include prizes, trips, bonuses, and others.

In this work we will use the job plan, the strategic remuneration and the management by competencies together in order to obtain a better result. By combining these three tools, we will seek to assign the correct functions, determining the right salary for the positions using strategic remuneration and making people seek the possibility of internal growth through the management by competencies policy.

6 COMPETENCE-BASED MANAGEMENT

The competency-based management model comes to value people who have the knowledge, present skills for their execution, and have attitudes to take the lead and make changes by presenting new ideas. In short, this system values the great talents.

For Fleury and Fleury (2000), competence is "a responsible and recognized know-how, which implies in mobilizing, integrating, transferring knowledge, resources, and skills that add economic value to the organization and social value to the individual.

The competency-based management comes to be a major contributor to the correct implementation of the Strategic People Management model. The study of the knowledge, skills, and attitudes of the partners (employees) comes to bring a new reality to the company, which can make good use of its employees, allocating them to the departments linked to their competencies and providing a right choice in new hirings.

Analyzing people's competencies makes them seek knowledge to supply what they lack, improving themselves through studies, training, lectures, among other various learning methods. This way, the company will have people with more knowledge and will repay them for it, consequently they will seek a constant evolution, which will bring new ideas that when correctly analyzed will become profit for the company. The competence of an organization lies in the competence of each person who works there. Uniting the competence of each person the company will conquer an essential competence, which is nothing more than adding value to its products.

7 TD&E - TRAINING, DEVELOPMENT AND EDUCATION

When talking about TD&E, not only are the needs of the company addressed, but also the meaning of work for lives is prioritized, analyzing the benefits that it brings to personal and professional life.

With the search for excellence in service delivery, companies have been investing more and more in training their professionals, enabling them to grow professionally and consequently increasing their revenues and customer satisfaction.

Training activities have existed since work has existed, because since the beginning men have had to teach each other ways to perform a task. The organizational function T&D emerged in the early twentieth century and since then organizations have been working with training more incisively, but over the years, the focus for these trainings has changed.

At the beginning of the 20th century, with the classic School of Administration, the objective of training was to make employees achieve the highest possible degree of productivity, considering only the mechanical aspects of the work. Some years later, training started to encompass also the psychosocial aspects, therefore, besides training, it started to include objectives focused on interpersonal relationships and the integration of the professional with the company. At the beginning of the 1940s, with the outbreak of the Second World War, the emphasis of training began to be on the preparation of managers and supervisors. At the end of the Second World War, the focus became leadership development. In the 1960s it started to have a systemic focus, involving the skills and knowledge of each professional and schematizing a way to implement the training, going through the diagnosis, setting up an action plan, executing it, and making evaluations after the implementation to analyze whether the result was beneficial or not.

With the impacting changes in T&D actions, the process started to encompass Education, becoming TD&E and acting in a more comprehensive and efficient way.

For Pilati (2006), the history of the TD&E actions has always been related to the administration models and has been influenced by different disciplines, such as psychology, sociology, among others, and their respective stages of technological development.

It is easier to understand the evolution of TD&E through the description of Bastos (1991, apud Pilati 2006) that divides such evolution into four waves. The first one is called the period of training for the work, seeking to aim only the manual performance of the employees, comprises the period from 1950 to 1970. The second is called training for management and supervision, which has as its main characteristic training actions for the operation of technological processes within the organizations; it comprises the period from 1960 to 1980. The third one aims at the importance of open and continued education, in which the professional himself identifies and prioritizes the training

needs, this one comprises the period from 1970 to 1990. The fourth began in 1980 and is the one that is still in force today. It emphasizes the development of the professionals' creativity, preparing them to make decisions and attributing greater demand for techniques to measure the effectiveness of training actions.

Pilati (2006) states that the fourth wave comes to present the DT&E in a different way within the organizations, seeking a strategic position

8 BENEFITS POLICY

Over the years, companies have adopted benefit policies in order to retain their talents. However, nowadays, a good benefits policy is no longer a differential, but rather a complement for the new generation of professionals. However, despite not being so relevant anymore, benefits can add a lot of value and make a difference in retaining talent.

Before the implementation of a benefits policy, it is necessary to analyze which benefits policy will be implemented in the company considering several factors, such as the needs of professionals, their level of education, age, the company's line of business, among others. This data must be analyzed, because a company can reward its professionals with trips when they reach a goal, however, these professionals would prefer a professional development offer, such as MBAs and training, which for them would be much more advantageous.

In the past, providing health and dental insurance was already enough. In the current scenario the practice has changed. Companies must analyze the wishes of their professionals and try to meet their needs. Companies must question who their talents are and what they want to pursue; this way they can trace a route, aiming to enable their talents to grow internally, making them reach their goals and dreams.

Considering a car dealership that has several departments and in each of them there is a different public, one should question the possibility of implementing flexible benefits, allowing the professional to choose the benefit according to his needs.

9 IMPLEMENTATION OF STRATEGIC PEOPLE MANAGEMENT

For the implementation of strategic people management, the tools mentioned during this work will be taken as a basis, executing them in the following order:

- 1) Position Plan: the description of all positions and functions present in the organization will be carried out;
- 2) Strategic Remuneration: seek a method to improve the remuneration policies, also benefiting employees who count only on a fixed salary;

- 3) Competence Based-Management: using the job descriptions and functions, analyze and assign competencies for each function;
- 4) TD&E: Intensify training by signing with a company specialized in courses and close agreements with colleges and specialized technical schools to encourage employees to seek to improve themselves through studies;
- 5) Benefits Policy: Study the ideal benefits policy to be implemented in the company, so that the collaborators can see that the company is concerned with their well-being.

The implementation method of the tools will not be simultaneous (insertion of all the tools in a single period), but it will also be necessary to be careful that the implementation of all the tools doesn't take too long, at the risk of jeopardizing the implementation process. The ideal implementation process is to first perform the job plan structuring, then implement strategic compensation simultaneously with competency-based management. After this process is done, it will be necessary to invest in the training of employees, starting the benefits policy that should be well structured within a year.

Before starting the implementation of the tools, it will be necessary to work with the organization's managers, reinforcing their function within their departments and especially for the company as a whole.

Every leader's objective is to seek a better performance, increasing productivity, thus reaching the expected results and seeking, as much as possible, the optimization of resources. For leaders to have this capacity, organizations must prepare their leaders and equip them with tools, and especially with talented and trained professionals. By following the guidelines of the Strategic People Management, the company will go through a calm implementation process, without many variables.

10 FINAL CONSIDERATIONS

The implementation of the Strategic People Management system is a big step for companies in the market to remain competitive. As verified through studies and research, it was found that companies want to retain their talents and to do this they are making radical changes, sometimes even changing the culture of the company in order to seek constant improvement.

It can be seen that there is a lot of work to be done at Ópera Peugeot dealership to implement this system, since the processes adopted by it on this point are quite primordial and often non-existent. However, if the directors of Opera Peugeot decide to implement the Strategic Management of People, they will come out ahead of many dealerships if we compare the results obtained by the questionnaires applied, and they will certainly retain the talents that are already present in the workforce and attract more talent. In this way, its service, which is already considered one of the best, will generate even

more fruit and profits for Peugeot Opera, because its employees will be motivated and interested in the objectives and goals of the company, constantly seeking its triumph and consequently reaching its objectives.

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CHAPTER 59

An analysis of the pedagogy of the sergipe curriculum of the new high school

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ABSTRACT

In this article, we seek to analyze and understand the theoretical bases that guide the curriculum reform of the New High School (NEM), as well as the Sergipe Curriculum (CS) of High School (EM). The study has a qualitative nature, of an exploratory bibliographic nature. Through the documental analysis of the BNCC and the CS of the EM, we raised reflections on the context of the Brazilian NEM, which, despite being considered innovative, is anchored in discussions that go back to past times. The analysis revealed a market logic underlying Sergipe's curricular device, as the propositions mainly aim to improve proficiency in assessment exams and the development of skills to enter the job market. In addition, an invisibility of socioeconomic, cultural and environmental diversity in the proposed skills and competences was evidenced. The founding curriculum theory of Sergipe's curriculum is the traditional one. In place of Pedagogy of Competencies, in which the propositions of Sergipe's curricular device are anchored, we propose that educators adopt the Pedagogy of Complexity to subvert the neoliberal logic imposed by reformist changes.

Keywords: New High School, Sergipe Curriculum, Pedagogy of Competencies, Pedagogy of Complexity, Teaching.

1 INTRODUCTION

The New High School (NEM), despite bringing the “new” in its name, is anchored in discussions that go back to past times.

The organization of the BNCC, aiming at a curricular reorganization, centered on the teaching of competences and skills, in addition to not bringing anything new, proposes for Education a system that has already been widely discussed and, in general, rejected by most educators (Branco, White, Iwasse, & Zanatta, 2019, p.168).

The proposals for the reform of the NEM, the National Curricular Common Base (BNCC) (2018), and the Sergipe Curriculum (CS) are covered by so-called innovative discourses, but which only integrate an archaic discourse, rescuing clashes of meanings and purposes of this stage of basic education, in the last two decades.

In view of this, the objective of this article is to understand the theoretical bases that guide the curricular reform of High School (MS) in Brazil, undertaken since the 90s,

until the implementation of the BNCC, and the consequent elaboration of the Sergipe Curriculum (CS) of the EM stage. We also seek to understand the relevance of the propositions of the curricular device, pointing out favorable and counterproductive scenarios, in addition to proposing the Pedagogy of Complexity for the subversion of the neoliberal logic imposed by reformist changes.

2 METHODOLOGY

The research developed has a qualitative nature, in which “the interpretation by the researcher with their opinions about the phenomenon under study is important” (Pereira et al, 2018, p.67). In addition, it has an exploratory nature.

These researches aim to provide greater familiarity with the problem, in order to make it more explicit or to form hypotheses. It can be said that these researches have as their main objective the improvement of ideas or the discovery of intuitions (Gil, 2002, p.41).

From this perspective, we sought the ideological bases of the BNCC (2018) and the CS of the EM to understand the curriculum reform, being able to classify the study also as exploratory bibliographic, as we resort to bibliographic sources related to the reform (Gil, 2002).

We proceeded with the document analysis, which consisted in deducing from the original documents, informational elements that explained their content succinctly, resulting in a secondary document, through a primary document (Ludke & André, 1986).

From the analysis, we denote the main reformist changes in this teaching stage, pointing out positive and negative aspects. In addition, we made a digression to point out possible inconsistencies, since such changes may not be relevant to the needs imposed by today's society.

3 A NOT-SO-INNOVATIVE NEW HIGH SCHOOL

High School has been a constant educational challenge, assuring signs of depreciation and nonconformity with the needs and expectations of students at this stage. This fact can have a negative impact when many are unable to follow the desired path, no matter how much they intend to (Silva, Jacob, Gomes, & Silva, 2021). Also according to the authors, the final purpose of this teaching stage would be:

[...] to improve the student as a human person, enable the continuation of studies, guarantee the basic preparation for work and citizenship and provide the student with the instruments that allow him to continue learning, with a view to developing an understanding of the scientific foundations - technological aspects of production processes (Silva, et al, 2021, p.2).

In the quest to achieve these goals, to ensure the provision of quality education to Brazilian youth, bringing schools closer to the current student experience, Law No.), stipulating the New High School (Brasil, 2017).

Despite having been proposed in 2016, regulated in 2017, and consolidated with the approval of the BNCC on December 4, 2018 , the reformulation of the EM covers speeches and purposes that go back to the mid-1990s, with the sanction of the Law of Education Guidelines and Bases (LDB) on December 20, 1996. Among its regulations, it is worth mentioning that in its Art. 26, the law determines that there must be a common national basis for all stages of basic education (Brasil, 1996).

In 1998, the National Education Council (CNE) approved Resolution No. 03/1998, in which it proposed linking the EM curriculum to the demands of the labor market and the productive sector, in addition to proposing that the curriculum be based on competencies ¹and skills ²(Brazil, 1998).

One of the first measures in the educational field taken by the federal government after Dilma Rousseff's impeachment was the enactment of Provisional Measure ³746/16 , which brought changes in the structure of the EM implementing Integral High School. This measure was motivated to correct the excessive number of subjects at this stage of teaching , which would not be suitable for the world of work. In addition, it aimed to articulate the reform to the four Delorian pillars : learning to know, learning to do, learning to live together and learning to be (Silva, 2018) .

The Brazilian educational reform demonstrates the direction that education took in the face of the productive restructuring of the capitalist logic. In this way, the school is subject to the formation of skills and abilities strategically linked to the international guidelines of external bodies. (Branco et al. , 2019, p.163).

The changes started with the progressive expansion of the annual minimum workload.

¹In the BNCC, competence is defined as “the mobilization of knowledge (concepts and procedures), skills (practical, cognitive and socio-emotional), attitudes and values to solve complex demands of everyday life, the full exercise of citizenship and the world of work” (Brazil, 2018, p.8).

²According to the BNCC, skills “express the essential learning that must be ensured to students in different school contexts” (Brasil, 2018, p.29).

³Available at: <https://www.congressonacional.leg.br/materias/medidas-provisorias/-/mpv/126992> . Accessed on: 29 Apr.2022.

The New High School extends the school's workload from 2,400 hours to at least 3,000 total hours, guaranteeing up to 1,800 hours for basic general training, with the knowledge provided for in the BNCC, and the rest of the day for training itineraries. Schools have until March 2022 to adapt to this change (Brasil, 2018, p. 9).

In addition to this change, the reform brought a new curriculum composition. According to the MEC, Law No. 13,415/2017 established a change in the structure of the EM, with the expansion of the student's minimum time in school and the insertion of Training Itineraries (IF) ⁴(Brasil, 2017).

The NEM brings a new curricular matrix whose structure is divided into General Basic Training (FGB), in which the areas of knowledge, the corresponding curricular units and the flexible part, composed of the Common and Integrated Training Itineraries (IFC), are found. two options for the school and the Formative Area Itineraries (IFA). In this way, the NEM curriculum would be formed by the BNCC and the IF peculiar to each education system.

Supported by the BNCC, the NEM promulgates curricular flexibility based on the IF, which can be organized by areas of knowledge (Languages and its Technologies, Mathematics and its Technologies, Natural Sciences and its Technologies, Applied Human and Social Sciences and Technical and Professional). In addition, FI can be done at any teaching unit in the network, at Federal Institutes, Units of the "S" System (SESI, SENAI and SENAC) and at a distance (EaD).

The curricular flexibility brought by the IF is pointed out as a great differential in this new proposal, being the option of choosing the itineraries, considered by the defenders of the NEM, as an impulse to promote knowledge, in order to make the engagement of students in studies more enjoyable. . However, we believe that such flexibility may reduce the knowledge that students can have access to. That is, when deepening in two areas of knowledge, two others are not studied.

In addition to not having complete training in the wide range of knowledge, the student has their free will suppressed, since in many cases they will not be able to follow the training itinerary they want, either due to lack of what is available to them, or difficulties such as transportation to the location where it is being offered (Silva, 2018).

⁴The Training Itineraries "are the set of curricular units offered by schools and education networks that enable students to deepen their knowledge and prepare for further studies or for the world of work". (Brazil, 2018, p.12). are mandatory and are formed by structuring axes (Scientific Research, Scientific Process, Scientific Investigative Mediation and Entrepreneurship) (Brazil, 2018).

Such flexibility also represents an imposition in a veiled way to the technical training of the student.

The reform advocated mandatory teaching only in Portuguese, English and Mathematics, making the teaching of Art, Physical Education, Philosophy, Sociology and another language optional in the three years of the EM. According to Silva (2018)

[...] the tacit exclusion of Law 11.684/2008 that composed Art. 36 of the Education Guidelines and Bases Law (LDB 9,394/96) implies a loss in the training of students, given the contexts in which these subjects are no longer part of the curriculum, marked by acts in which all social criticism is seen as a threat to an order based on will and authoritarianism (p.3) .

With details only in Portuguese and Mathematics, the other subjects will be subsumed in areas described in terms of competences that EM could offer students. The teaching of Spanish in the State of Sergipe is mandatory, which we consider positive, as it represents an enhancement of the Hispanic culture , which is commonly marginalized.

The non- compulsory teaching of Sociology and Philosophy can drastically compromise the formation of the citizen, as they are subjects that raise collective reflections in search of social and individual well-being, in addition to promoting an exercise of dialogue, investigation, and thinking. In this way, they provide foundations for the construction of the subjects' citizenship.

In the new curricular structure, youth protagonism is emphasized as a path to be followed in this new conception of education, with a focus on areas of knowledge and technical and professional training.

NEM focuses on the relevance of youth protagonism, proposing that young people, through their life project, define their formative path. However, the education system is not ready to meet the diverse demands of these divergent projects. The Life Project (PV) discipline aims to develop skills that guide students towards their personal and professional plans, as well as helping them to become critical citizens and belonging to society (Brasil, 2022).

However, this proposal is not in line with the reality of Brazilian schools. For this purpose to work, schools need to be prepared to carry out projects, workshops, mentorships to help students direct their studies. In addition, teachers need to be prepared to teach the PV subject. Only the distribution of material prepared by the PNLD will not ensure the progress of the discipline.

One of the four guiding axes for the elaboration of the disciplines of the Training Itineraries that deserves to be highlighted is Entrepreneurship ⁵. The prism brought by CS points to the concept as innovative, proposing that students undertake in their perspectives of life. However, the skills proposed in this axis refer us to the traditional concept of Social Entrepreneurship (ES), in which the acts of managing, innovating and creating provide opportunities for maximizing the social capital of a group. In this way, it is not possible to decouple the “undertaking” from the underlying banking logic throughout the document.

Neoliberal perspectives maintain this economic emphasis: education serves market performance and its expansion enhances economic growth. In this sense, it is defined as the activity of transmitting the stock of knowledge and knowledge that qualify for competitive individual action in the economic sphere, basically, in the labor market (Gentili, 1995, p.193).

Stating that entrepreneurship encourages students to know themselves collectively, this proposition is contradictory, as it brings in a veiled way the need for the student to think about ways to enter the job market. Thus, the importance of active and meaningful participation in their learning is ignored, disregarding the student reality, their demands and their socio-environmental, cultural and economic peculiarities.

The focus given to skills and competences linked to VP and Entrepreneurship corroborates the utilitarian bias given to the formation of the individual. This is because the propositions refer to banking education, which conceives knowledge as bank deposits to be made in empty safes, which will be enriched by receiving them (FREIRE, 2016).

Thus, as much as Sergipe treats Education as a State policy and has injected millions of reais into the area in the last four years, investments are not capable of subsidizing a change in the education system that is relevant to the needs and idiosyncrasies of the Sergipe community. . We make this inference because the critical analysis of the CS shows us the invisibility of socioeconomic, cultural and environmental diversity in the proposed skills and competences.

We will continue with the analysis of the curricular theories present in the CS. By analyzing what is between the lines of the curricular device, confronting it with the curricular theorization, we give rise to a discussion around the dangers of its implementation without the necessary criticism. In this attempt, we seek to strengthen the

⁵⁴In the Scientific Research Axis, the skills are related to scientific thinking and doing; in the Creative Processes Axis, the skills are related to creative thinking and doing; they are related to self-knowledge, entrepreneurship and life project” (Brasil, 2022, p.89).

resistance of those who will not succumb to the romanticized discourses used as subterfuges to maintain the *status quo* through which students need to be trained just to enter the job market or for proficiency exams (Paula, 2020) .

4 SERGIPE'S HIGH SCHOOL CURRICULUM AND PEDAGOGY OF COMPETENCIES

The conceptualization of curriculum theories is important for us to know which theories Sergipe's curricular propositions are based on. We cannot summarize them only to the set of contents arranged in a curriculum. According to Silva (2005), curriculum theories are pedagogical approaches responsible for pedagogical approaches responsible for presenting the dynamics, functions and perspectives of the curriculum in the educational context, being characterized by the concepts that emphasize:

Traditional Theories: (emphasize) teaching - learning - assessment - methodology - didactics - organization - planning - efficiency - objectives. Critical Theories: (emphasize) ideology- cultural and social reproduction power- social class- capitalism- social relations of production awareness- emancipation- hidden curriculum- resistance. 4 Post-Critical Theories: (emphasize) identity- alterity- difference subjectivity- meaning and discourse- knowledge and power- representation culture- gender- race- ethnicity- sexuality- multiculturalism (Silva, 2005, p.17).

Also according to the same author, it is possible to infer that traditional theories are disinterested and neutral, aiming to identify the objectives of education in a general and academic way. Critical theories, on the other hand, question the curricular purpose, contesting the dominant forms of knowledge. In addition, they problematize the existing interconnection between curriculum and power relations, as it is commonly used as an instrument for denying diversity, exclusion and even preventing the rise of the individual. Finally, post-critical theories raise discussions that focus on the existing interconnections between curriculum, power, ideology, difference and the multidimensionality of being.

When analyzing between the lines, we identified that the curricular theory on which the CS is based is the traditional one, since the educational objective brought by the text corroborates the definition of competences established by Perrenoud (1999), which states that:

[...] an expert is competent because he simultaneously: (a) masters, very quickly and safely, the most common situations, having at his disposal complex schemes that can immediately and automatically go into action, without hesitation or real reflection; (b) is able, with a

reasonable effort of reflection, to quickly coordinate and differentiate their action plans and their knowledge to face unprecedented situations (p. 27).

When analyzing the scope of the BNCC (2018), we perceive a co-option of the Perrenoudian concept of competences, with a reconfiguration of the Delor-based learning to learn pedagogy. The result of this is a pedagogy that leads the teaching action towards the adaptation and acceptance of the current order, as a strategy for the maintenance of the dominant ideology.

The notion of competences, incorporated as a device capable of producing changes in the curricular organization of high school with a view to overcoming the limits of excessive disciplinization and based on the accumulation of information, is shown to be limited by its pragmatic and ahistorical character. It reproduces in other bases the limits set by the disciplinary and sequential curriculum, as it does not carry out the necessary inversion, that is, it does not allow learning and the exercise of reflection with the depth that cultural training requires (Silva, p.13, 2018).

The curriculum reform also aims to increase public investments in this level of education, something that is revealed by the economic perspective of the reform discourse as well as the approximation with the private sector (SILVA; SCHEIBE, 2017). The hiring of Fundação Lemann and Instituto Airton Senna to advise the entire process of building the CS text is further evidence of the neoliberal education character that Sergipe's curriculum brings. In this sense, Saviani (2014) mentions that

[...] the strength of the private, translated into an emphasis on market mechanisms, has been increasingly contaminating the public sphere. This is how the movement of entrepreneurs has been occupying spaces in public networks via UNDIME and CONSED in the Education Councils and in the State apparatus itself, as illustrated by the actions of the "Todos pela Educação" Movement (p. 105).

An education based on the principles of skills and competences is shown to be at the service of the State, which, in turn, walks along the paths of neoliberalism.

In fact, neoliberalism constitutes a hegemonic project. That is, a dominant alternative to the crisis of contemporary capitalism through which it is intended to carry out a profound process of material and symbolic restructuring of our societies. Neoliberalism must be understood as a class project that guides, at the same time and in an articulated way, a set of radical reforms at the political, economic, legal and cultural levels (Gentili, 1995, p.192).

Thus, we conclude that neoliberal education is about applying forms of domination instituted by the hegemonic logic of capitalism. Although the text explicitly raises the concern with the emergence of an educational practice that focuses on thinking and re-signification of knowledge and practices in individual existences (Sergipe, 2018), a deeper analysis reveals that the main educational objective of the CS is to specialize subjects to make them able to enter the job market or improve in assessment exams. “This ends up homogenizing the curricula of the countries with the intention of being able to carry out international assessments such as PISA. By homogenizing, it silences different discourses and ends up being opposed to the very meaning of investigative teaching” (Sipavicius , & Sessa, 2019, p.7).

Furthermore, in an attempt to improve the indices in the evaluation, there is a reinforcement of the Eurocentric vision and of an undervalued approach to the contents in the south, causing this posture to result in the invisibility of places of speech and the suppression of socio-environmental reflections and the Sergipe's sociocultural diversity.

According to Mézáros (2008), “limiting a radical educational change to the self-interested corrective margins of capital means abandoning at once, consciously or not, the objective of a qualitative social transformation” (p. 27). Thus, according to the author, we need broader educational processes to overcome the logic of capital underlying Brazilian education, so that we can move towards a society beyond capital. Unfortunately, CS goes against this path.

The BNCC should be the starting point for curriculum development. However, we were presented with a set of “ready-made recipes” on how the individual can train to be able to enter the job market or improve their proficiency in the main assessment exams. Citizens formed in this perspective end up being held by “invisible ties” that repel the development of transgressive consciousness in search of emancipation.

It becomes clear that achieving an emancipatory education is a goal that will hardly be achieved, prioritizing curricula that value tacit knowledge and that intend to confer skills and abilities to perform mechanical and everyday tasks. In this way, teaching focused, and still in a limited way, on the issue of professional qualification, puts the full development of the individual and their preparation for the exercise of citizenship in the background (Branco et al. , 2019, p.168).

Although the CS has some innovations in relation to the base, such as the eight guiding principles ⁶, which are peculiar to the Sergipe text, all the skills are an *ipsis litteris transcription* of what is brought in the BNCC, with the exception of some specific skills ⁷created for the State of Sergipe. In addition, due to the short term, it was a synthetic and lightened production, inheriting the struggles and obstacles that permeated the base production process, eventually undermining the document's criticality.

“[...] By highlighting the development of skills and abilities, a logic is adopted in which individualism and competition are strengthened, with a focus on individual performance and the interests of capital” (Branco et al. , 2019, p.168). The pedagogy of competences strives for the formation of subjects who are adaptable to the dominant ideological impositions, and who know only what is necessary, devaluing the knowledge contained in the content.

This pedagogical model “[...] does not produce intellectual and moral autonomy, nor a critical spirit; produces greater adaptability to changes in capitalism” (Duarte, 2011, p. 187). To escape the imposed educational neoliberalism, it is necessary to seek confrontations in the transposition of these proposals on paper, until they come to life in the classroom. In this way, in addition to the guiding principles, skills and competences that the SC aims to promote, it is possible for the educator to adopt the pedagogy of complexity.

5 PEDAGOGY OF COMPLEXITY: SUBVERTING THE MARKETING LOGIC OF THE SERGIPE CURRICULUM

The Brazilian education model is anchored in modern science, which in turn is supported by mechanistic determinism, as it strives for utilitarian and functional knowledge.

In order to overcome the fragmentation commonly instituted to the hegemonic rationality underlying the educational process, and to despise the domination instituted over the environment, we point to the need to apprehend the theory of complexity by the educational paradigm (Author).

⁶The Sergipe Curriculum is based on 8 (eight) guiding principles that aim at the integral development of the student: Collaboration, Respect for difference, Criticality, Inclusion, Equity, Autonomy, Sustainability and Creativity. Each of them collaborates harmoniously for integral education, which aims at the full development of students and the promotion of a fair, democratic and inclusive society (Sergipe, 2018).

⁷“For the new learning objectives and skills created by Sergipe, it was agreed between the writers to guarantee the standardization of the Base structure, which followed the following criterion: [...] The code will have a pair of letters at the end of the sequence with the acronym SE (eg: EF08MA01SE, EF: Elementary School, 08: eighth grade; MA: Mathematics; 01: sequence in which it is written in the curriculum; SE: Sergipe)” (Sergipe, 2018, p.17). The analysis of these specific skills will be the subject of another work.

Starting from this prerogative, it is necessary that we subvert the market logic underlying the reform of High School, replacing the pedagogy of competence with the pedagogy of complexity. So that there is a reconnection of knowledge, commonly compartmentalized, promoting educational epistemic dialogue in search of overcoming reductionism, homogenization and invisibilization in the hegemonic educational field.

The objective of the pedagogy of complexity is that we seek a non-fragmentary and non-totalizing knowledge, due to its incipience and limitation. The knowledge that emerges from this pedagogy is called pertinent, because in the midst of the complexity of the real, it recognizes that totalitarian understanding is not possible, making the search for knowledge an infinite effort (Diniz, & Tomazello, 2005, p.89).

Thus, there may be a reorientation of thoughts and visions, commonly reductionist, from the reconnection of knowledge that is usually compartmentalized (Morin, 2003). For that, a paradigmatic reform of the thinking about our knowledge organization is necessary.

The way we build knowledge is always a paradigmatic way of thinking, the result of models and patterns that, consciously or not, inspire and materialize a certain type of rationality, a way of thinking, operating thought and building knowledge. With this, we begin to realize that our way of seeing, observing and building something is always conditioned by several factors intrinsic to our being and influenced by the social and cultural factors of the contexts involved (Moraes, 2019, p.117).

For Morin (2006), it is necessary to understand that we live ideologically in barbarism and in the prehistoricity of the human spirit. Thus, confrontation must imply a chain reorganization of the concept of educating.

Complexity “is a principle that allows us to reconnect things, events, phenomena, processes, events. It implies, therefore, a common fabric that places the parts as inseparably associated with the whole that weaves the complex web of life” (Moraes, 2019, p.126).

In this way, according to Nascimento, & Araújo (2021), in order to transpose the current Brazilian paradigm in search of complexity, a new educational revolution is necessary, through the emergence of complexity. This is because Brazilian education, secularly stagnant, institutes in a veiled way some invisible ties that prevent us from transgressing the hegemonically placed paths.

Complexity transits between the conceptual plots precisely because it is not a method, but a way of thinking that takes on itself various possibilities, which are refuted and extended, revealing possible links and seams and playing again in a constant movement (Pires, & Veiga, 2020, p.6).

Based on this assertion, it is necessary to face the barriers dialectically imprinted by the sociocultural factors of our context, in order to work in a perspective that highlights the multidimensionality and complexity of society. In this way, there is a promotion of the subject's emancipation and autonomy, as well as respect and dialogue with sociocultural diversity (Leff , 1998).

Therefore, teaching innovation would demand the adoption of interactive teaching methodologies that go beyond the development of competencies and skills, in favor of solving contextualized problems. As the characterization of the pedagogical practice is based on socio-historically constructed paradigms, accompanied by beliefs and values, it is necessary to promote deep reflections that bring an educational repara-digmatization that meets the current needs.

In this way, the school institution needs to provide primarily the opportunity to carry out an education aimed at the acquisition of new knowledge, attitudes, behaviors and values of all those involved in the educational process.

In this sense, the pedagogy of complexity should teach how to think about socio-environmental reality as a process of social construction, based on the integration of interrelated and interdependent processes, and not as isolated facts, predetermined and fixed by history (Leff , 1998, p. .259).

However, we are aware of the difficulties in establishing transgressive pedagogical practices, as our actions are based on outdated paradigms, whose socio-historical construction is accompanied by beliefs and values, which are rooted in our conceptions of the world. “Without diving into this complexity, the understanding of life and the profession reveals itself to be fragmented, with no sense to generate development” (Pires, & Veiga, 2020, p.4). In this way, it is necessary to promote deep reflections that bring a “ repara-digmatization ” of Brazilian education, in order to meet the needs and expectations of today's society.

6 FINAL CONSIDERATIONS

We seek to show that the reform of the New High School, as well as the propositions of the Curriculum of Sergipe, in the light of the BNCC, does not dialogue with the current stage of knowledge at the level of High School in the State of Sergipe, much less with the inherent needs of complexity. current company.

The reforms end up legitimizing neoliberal policies for Brazilian education, representing setbacks for the educational system, as they corroborate the technicist training, reinforce the existing structural exclusion, in addition to causing the impoverishment of the content offered in the EM.

Through the development of certain competences and abilities, the expected path for the Sergipe student community is to improve their proficiency in assessment exams and for new ways of organizing productive work. The pedagogy of competences emphasizes learning through repetition, practiced for a long time in the classroom, contrary to the paradigm of complexity.

Despite all the marketing/banking logic instituted by the EM reform, it is up to teachers to fight for principles that provide opportunities for pedagogical practices concerning the inherent diversity of subjects as well as the idiosyncrasies of each school community. In this way, we need to encourage discussions so that the curriculum is not used as an instrument to make the individual invisible and to homogenize diversity.

We emphasize the importance of the development of complex Pedagogy, through the resignification of Morin 's thought , to the detriment of Pedagogy of Competencies, to highlight the necessary reconnection of knowledge for a new educational epistemic dialogue. In raising it, we seek to overcome reductionism, exclusions and invisibility in the educational field.

In a market education at the service of capital, it is necessary to consider what is in place, to evaluate the positive and negative aspects brought about by the changes instituted by the NEM reform and the Sergipe curriculum of this stage. From such musings , constant processes of self-reflection, subversion and resistance are required, towards the essential changes for a pedagogy of complexity. Thus, the students would be led to emancipation and deinvisibleization, in addition to guaranteeing their voices, traditionally silenced.

It is essential that studies are developed that promote the unveiling of latent and opaque realities of the NEM, and that highlight the importance of Pedagogy of Complexity for an educational model relevant to today's society. In addition,

investigations can be carried out on the relevance of discussions and considerations about the teaching and learning process at this stage of teaching.

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CHAPTER 60

Preliminary studies of the action of efficient microorganisms (em) in the bioremediation of water from the vila bananeira dam in arapiraca-alagoas, brazil

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ABSTRACT

Efficient micro-organisms (EM) are regenerative and completely natural, formed by lactobacilli, yeasts, photosynthetic bacteria and actinomycetes, which act on the physical, chemical and biological properties of the soil, being able to solve environmental problems such as, for example, wastewater treatment. The

objective of the work was to analyze the effect of the EM inoculants on the bioremediation of water contaminated by animal waste as well as the physical-chemical and microbiological parameters of the fermented EM and contaminated water. The EM was captured and activated using the homemade method. The protocol for collecting contaminated water and EM samples was in accordance with Standard Methods for the Examination of Water and Wastewater. Total and thermotolerant coliforms of both water and EM were investigated, using the most probable number (MPN) technique, known as the multiple tube method. The physical-chemical parameters (pH, total solids, sodium, nitrite, nitrate, chlorides, total hardness, apparent color, conductivity, and turbidity) of the contaminated water and the EM were evaluated. To assess the bioremediation potential of EM, 10 tests were performed with different percentages of dilution of microorganisms, which followed the following concentrations: 0.3; 1.0; 3.0; 20; 25; 30; 35; 40; 45 and 50% of EM. It was possible to verify that the physical-chemical parameters analyzed meet the prerequisites of the Ministry of Health with regard to water quality, however, regarding microbiological parameters, 99% of the samples proved to be unfit for human consumption. The fermentation of efficient microorganisms is free of the coliform group. As for bioremediation using EM, low concentrations of 0.3 to 3 did not remedy the coliform group, however it was found that gradual concentrations of at least 25% of EM can remedy up to 78% of the coliform group.

Keywords: Total coliforms, thermotolerant coliforms, physical-chemical parameters, environmental pollutants.

1 INTRODUCTION

Among the natural resources, water is one of the most important on the planet and its use has intensified in recent decades with economic development and population growth, both in terms of the increase in the quantity demanded for a given use, as well as the variety of uses. its use (SILVA and ANDRADE, 2014).

According to Santos et al. (2010), maintaining water quantity and quality standards represents a challenge to society, since most problems related to water resources have as main problems the lack of planning and management, in addition to their contamination. This new look has been triggering actions and strategies to preserve the environment, land occupation and development of less harmful production processes (MORAES et al., 2014).

Among the biotechnologies used for the recovery of contaminated areas, efficient microorganisms (EM) consist of a combination of completely natural microorganisms (lactobacilli, yeasts, phototropic bacteria and actinomycetes), which when they coexist, present a synergistic effect that is greater than the sum of its individual members, being able, among many applications, to solve environmental problems such as, for example, treating wastewater. The use of microorganisms as tools for the remediation of contaminated environments is called bioremediation. This process can be carried out through one or more microbial consortia, indigenous or not, for the degradation of polluting organic contaminants (PEREIRA and LEMOS, 2003).

According to Tavares (2013), this is a technology that currently has a rapid growth, especially in collaboration with genetic engineering, used to develop strains of microorganisms that have the ability to

deal with specific pollutants. Under suitable conditions, microorganisms help or are responsible for chemical reactions that result in compounds that present little or no risk to living beings (MOREIRA and DOURADO, 2007).

In this context, the main objective of this work was to evaluate the effect of efficient microorganisms (EM) in the bioremediation of water contaminated by animal waste from the Vila Bananeira dam.

2 MATERIAL AND METHODS

Water samples for bioremediation evaluation were collected at the Vila Bananeiras Dam (9° 50'33.6 "S 36°34'15.8"W) located in the rural area of the municipality of Arapiraca-AL, Brazil. The EM collection was carried out in a Private Reserve of Natural Heritage in Junqueiro – RPPN Madeiras (9°51'53.5"S 36°20'00.2"W) and its activation was carried out in the forestry resources laboratory, while the microbiological analyzes were carried out in the laboratory of microbiology, both from the Arapiraca Agro-Food Technological Pole of the State University of Alagoas. The physical-chemical analyzes were forwarded to the Analytical Central laboratory. The EM was prepared and activated through the homemade method of capturing and preparing the soil (SIQUEIRA et al., 2013). Cooked rice without salt was used for capture and placed on trays covered by a thin protective screen, the trays were left in virgin forest, covered with litter for approximately

15 days. For activation, molasses and water without chlorine were used, the mixture was placed in a container with a lid where it was fermented for 15 days.

The collection procedure followed the protocol according to Standard Methods for The Examination of water and Wastewater (HUNT and RICE, 2005). The collections took place in July 2019, using a stainless steel container and a polypropylene bottle to store water, all previously autoclaved at 121°C at 1kpa for 60 min, after which it was sent in Styrofoam boxes to the microbiological analysis laboratory.

2.1 EM DILUTIONS USED FOR BIOREMEDIATION:

The ME concentrations used to bioremediate the water from the Dam (BA) were: 99.7% BA + 0.3% EM; 99% BA + 1% MS; 97% BA + 3% MS; 80% BA + 20% MS; 75% BA + 25% MS; 70% BA + 30% MS; 65% BA + 35% MS; 60% BA + 40% MS; 55% BA + 45% MS; 50% BA + 50% EM.

2.2 MICROBIOLOGICAL ANALYSIS:

The methodology used was that of the American Public Health Association (APHA), total and thermotolerant coliforms were quantified using the technique of the most probable number (MPN) of the EM dam water and EM dilutions. After the analysis of the presumptive tests carried out in serial dilutions of 10^{-1} , 10^{-2} and 10^{-3} with LST Broth (Lauril Tryptose), of the tubes with a positive result , a survey was carried out in tubes with 10 ml of Bile Broth 2% Brilliant Green (to quantify total coliforms) that were incubated in a bacteriological oven at 35.5°C for up to 48 hours, and a rise in tubes with 10 ml of EC broth (*Escherichia coli*) (for thermotolerant coliforms) which were placed in a water bath at 45.5°C for up to 48 hours.

The positive results of the tests evaluated were observed by the formation of bubbles in the Durham tubes, through the fermentation of the broths. The results were compared with those established by the Brazilian Ordinance (Consolidation Ordinance) No. 5 of the Ministry of Health and with Resolution No. 357 of CONAMA, 2005.

2.3 PHYSICAL-CHEMICAL ANALYSIS

The methodology used for analysis by the Central Analytical laboratory was the Standard Methods for the Examination of water and Wastewater . Dam water and EM were evaluated with the following parameters for dam water – pH, total solids, sodium, nitrite, nitrate, chlorides, total hardness, apparent color, conductivity and turbidity.

3 RESULTS AND DISCUSSION

3.1 MICROBIOLOGICAL ANALYSIS OF DAM AND ME WATER:

It can be seen in table 1 that the water from the banana dam has a group of coliforms in the NMP value >1100/ mL showing 99% of contamination index. This result differed from Dornellas and Xavier (2008), who evaluated 6 collection points in the Piauí stream, one of them being the dam water, found 46.0 MPN/100mL. The dam was built 19 years ago with the purpose of generating jobs, income and leisure, but observing the results and according to CONAMA resolution nº 357, it does not fit into the class 1 of fresh water that can be destined to supply for consumption . human; to primary contact recreation such as swimming, water skiing and diving.

Table 1. Microbiological and pH assessment of the dam water and effective microorganisms, in July 2019.

	NMP/100mL	pH
BA	>1100	7.44
IN	<3.0	3.21

The NMP observed in the efficient microorganisms was <3.0/100mL, proving that it is free from the coliform group. *Escherichia coli* is used all over the world as a bioindicator of fecal contamination, in this sense it is a biological parameter that serves to monitor food, water, biofertilizers , etc. EM are widely used in agricultural practices and human health, few studies report microbiological analysis. The study shows that it can be recommended for all purposes as a soil conditioner, water decontamination and as a plant biofertilizer .

Darolt and Neto (2006), analyzing anaerobic and aerobic biofertilizers , also verified the absence of the fecal coliform group. The fermentation process that occurs to obtain the biofertilizer can be considered as one of the main factors that control the survival of pathogenic microorganisms, which may be related to the action of temperature, which possibly has been one of the determining factors in the destruction of fecal coliforms. . According to Gotaas (1956), and Kiehl (1985), these organisms do not survive at a temperature of 65°C, when exposed for 60 minutes. Another possibility would be the synergistic or antagonistic interactions between microorganisms (LOURES, 1988).

For the use of EM at concentrations of 0.3; 1 and 3% the values were >1100 NMP/100ml, showing that the water was not remedied, that is, the help of microorganisms in these percentages was not effective. In concentrations of 20; 25; 30; 35; 40; 45 and 50 the NMP result was: 15; 7.4; 7.2; 15; 3.6; <3.0; <3.0 for total coliforms, respectively. For thermotolerant coliforms, following the

same concentrations the values were: 27; 7.4; 7.2; 15; 3.6; <3.0 and <3.0 (table 2), showing within the required by CONAMA.

Table 2. Most likely number (MPN/100mL) of total and thermotolerant coliforms at concentrations of 0.3; 1; 3; 20; 25; 30; 35; 40; 45 and 50% of effective microorganisms.

BA+EM	NMP/100mL of total coliforms	NMP/100mL of thermotolerant coliforms
99.7% BA + 0.3% EM	>1100	6.1
99% BA + 1% EM	>1100	<3.0
97% BA + 3% EM	>1100	11
80% BA + 20% EM	15	27
75% BA + 25% EM	7.4	7.4
70% BA + 30% EM	7.2	7.2
65% BA + 35% EM	15	15
60% BA + 40% EM	3.6	3.6
55% BA + 45% EM	<3.0	<3.0
50% BA + 50% EM	<3.0	<3.0

Serial dilutions by the NMP technique were performed in aliquots of 0.1; 0.01 and 0.001

In bioremediation, living organisms are used technologically to remove and reduce environmental pollutants. It is an ecologically more adequate and effective alternative for the treatment of environments contaminated with organic molecules that are difficult to degrade, heavy metals, called recalcitrant, which may be of natural origin, synthesized by biological metabolism (SANTOS et al., 2009). The MS under study showed their ability and efficiency to be used as a bioremediator. According to Bonfim et al. (2011), the production of ME by family farming is an accessible and low-cost technology. As already pointed out, physical-chemical analyzes of both the dam water and the EM were also carried out, and only based on the results of table 3, the dam water would be satisfactory for human consumption, being within the recommended by the Brazilian Consolidation Ordinance 5 of the Ministry of Health, however, the work presented here is purely investigative and does not aim to accurately classify the potability of water from the banana dam, where it would also be necessary to measure the presence of other inorganic chemicals, as well as the heavy metals that can come from soil contaminated by pesticides, from local agriculture.

According to Lenzi et al. (2014), the acidity of natural waters comes from weak acids, such as dissolved carbon dioxide and even hydrogen sulfide, in addition to amino acids, fatty acids and conjugated acids of weak bases. Normally, $\text{CO}_2^{-}(\text{aq})$ comes from the atmosphere or from the water body itself, caused by the action of aerobic microorganisms, which justifies the change in pH of BA water when compared to EM.

Currently, the banana dam water is used only for irrigation, however, due to the microbiological results, it cannot be used for this purpose.

At a concentration of 100%, EM, due to the physicochemical characteristics shown in table 3, cannot be used for human consumption or for irrigation. In general, it becomes complex to compare water with a solution of efficient microorganisms. Studies of physicochemical parameters at different dilutions of EM are required.

Table 3. Physicochemical parameters of contaminated water and efficient microorganisms (EM).

parameters	Water contaminated by animal waste	Efficient Microorganisms (EM)
pH*	7.44	3.21
Total solids (mg/L)	585.2	2988.3
Sodium (mgNa /L)	108.3	118
Nitrite in N, (mg/L)	0.06	0.32
Nitrate in N, (mg/L)	0.54	21.28
Chlorides (mgCl /L)	185.64	1115.84
Total hardness (mgCaCO3/L)	134.00	1400.00
Conductivity ($\mu\text{S}/\text{cm}$)	780	3984
Turbidity (NTU)	12.99	206.00

pH*- Hydrogenonic potential

4 FINAL CONSIDERATIONS

As preliminary results of the action of efficient microorganisms in the bioremediation of water, we have that the best MPN observed was $<3.0/100\text{mL}$, showing that it is free from the coliform group, an initially satisfactory result, despite the need for low concentrations of dilutions, requiring further economic feasibility studies vs production, since the remediation of contaminated water takes place in gradual concentrations of at least 25% of fermented effective microorganisms,

which can remediate up to 78% of the coliform group. The microbiological results showed that the water from the Vila Bananeira dam has a group of coliforms in the NMP value $>1100/ \text{mL}$ showing 99% of contamination index, thus, according to CONAMA resolution n° 357, it does not fall into class 1 of water. sweets, making their use unfeasible for both irrigation and human consumption.

It is concluded that according to the physical-chemical parameters evaluated, the dam water is satisfactory for human consumption, being within the recommended by the Brazilian Ordinance (Consolidation Ordinance) n° 5 of the Ministry of Health, however, it is necessary to analyze other chemical constituents for total potability classification, in addition to further studies with EM dilutions, which will show the correlation of the formation of diluted weak acids as a result of EM action. Last but not least, we point out the need to complete the initial project of the Vila Bananeira dam, so that it will contribute to its social role and justify its investment of approximately R\$ 20 million reais.

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CHAPTER 61

Governance aspects for the development of smart and sustainable cities

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ABSTRACT

The search for sustainable development has required cities to adopt an innovative style of collaborative governance to design public policies, aimed at improving the quality of life of citizens, ensuring economic growth without compromising future generations. This article aims to demonstrate and evaluate the indicators and data on the ranking of smart cities in relation to the governance factor and its connection with public policies. For a better understanding, a conceptual analysis on sustainability will be presented, making a literature review, referencing the main concepts that make up sustainable development. The method used was documentary and bibliographic research, followed by the analysis of secondary data information obtained from the Connected Smart Cities (CSC) website. In the results section, the ranking related to the governance axis was analyzed in the following aspects: first, referring to the ranking of the top 10 smart cities in Brazil; then, the 10 cities considered smart in the Northeast region of Brazil were analyzed and, thirdly, the cities classified as smart in the State of Pernambuco. The concepts and analyzes obtained in this research demonstrated the search for a sustainability model that incorporates the idea of the

urgency of transforming the environmental capacity, associated with the human capacity to sustain itself, through actions of the public power, organizations and society transforming the way cities act by providing the addition of smart cities. first referring to the ranking of the top 10 smart cities in Brazil; then, the 10 cities considered smart in the Northeast region of Brazil were analyzed and, thirdly, the cities classified as smart in the State of Pernambuco. The concepts and analyzes obtained in this research demonstrated the search for a sustainability model that incorporates the idea of the urgency of transforming the environmental capacity, associated with the human capacity to sustain itself, through actions of the public power, organizations and society transforming the way cities act by providing the addition of smart cities. first referring to the ranking of the top 10 smart cities in Brazil; then, the 10 cities considered smart in the Northeast region of Brazil were analyzed and, thirdly, the cities classified as smart in the State of Pernambuco. The concepts and analyzes obtained in this research demonstrated the search for a sustainability model that incorporates the idea of the urgency of transforming the environmental capacity, associated with the human capacity to sustain itself, through actions of the public power, organizations and society transforming the way cities act by providing the addition of smart cities. cities classified as smart in the State of Pernambuco. The concepts and analyzes obtained in this research demonstrated the search for a sustainability model that incorporates the idea of the urgency of transforming the environmental capacity, associated with the human capacity to sustain itself, through actions of the public power, organizations and society transforming the way cities act by providing the addition of smart cities. cities classified as smart in the State of Pernambuco. The concepts and analyzes obtained in this research demonstrated the search for a sustainability model that incorporates the idea of the urgency of transforming the environmental capacity, associated with the human capacity to sustain itself, through actions of the public power, organizations and society transforming the way cities act by providing the addition of smart cities.

Keywords: Governance, Smart Cities, Economical Development, Public Policy.

1 INTRODUCTION

Population growth and migration to large cities have generated numerous problems for society. The 21st century is marked by important social phenomena and, mainly, by the large concentration of people in urban environments (UN, 2012). With the increase of inhabitants in urban areas around the world, it has brought reflections on how public policies can offer more efficient and effective services to society.

In this sense, Brazilian municipalities are currently facing a series of challenges, which call into question the development of several regions, due to the concentration of the population and the limitation of resources, requiring particular attention for sustainable development and improvement in the quality of life of people . (BATAGAN, 2011).

In recent decades, the approach to sustainability has taken on a new role in the attempt to evolve society, through sustainable development, defined as “one that allows meeting their needs without compromising the ability of future generations” (BRUNDTLAND, 1987, p. 46).

With the worsening of the environmental imbalance, alternatives were established for cities to reduce their impacts and establish a direct link with society, in order to optimize the coexistence between the environment and people. In the wake of this movement, the “*smart cities*”, in the Portuguese translation the “smart cities”, which objectively has governance as the main element for its existence, promoting economic, social and environmental development. Well, governance is an essential part of the development of smart and sustainable cities, since it refers to the relationship between individuals, interest groups, institutions and administration service providers, with actions aimed at the community . (ALBINO; BERARDI; DANGELICO, 2015).

This article has the following research problem: how does governance contribute to the sustainable development of smart cities in the Northeast region of Brazil? In order to answer the problem, this article aims to assess the relevance of the contribution of governance aspects to the development of smart and sustainable cities located in the Northeast region of Brazil. Following, in view of the definitions presented in this study, through a literature review and analysis of organizational indicators on aspects of governance present in cities characterized as "smart cities"

In this sense, the research is justified by the description of the main difficulties in facing the challenges in the elaboration of public policies with governance solutions in Brazilian cities, as global sustainability will not be achieved without a transformation in the model of thinking, acting and planning urban spaces. .

This article is structured in five sections. In this first section, the research objective and justification were presented in the introduction. The second section addresses the theoretical foundation, segregated into topics referring to sustainability concepts; sustainable development, economic growth and the challenges of the 21st century; public policy; governance and smart cities. The third section presents the methodology. In the following section, it demonstrates the results acquired in the research. And finally, there are the conclusions of the study.

2 THEORETICAL FRAMEWORK

In this section, the concepts that will guide this study will be presented, among them, sustainability concepts; of sustainable development, economic growth and the challenges of the 21st century; of public policies, governance and, finally, smart cities.

2.1 CONCEPT OF SUSTAINABILITY

Before explaining the concepts of sustainability, it is important to record the origin of the term sustainable. According to Hoffer (2009), the term sustainable originated from the German expression “*Nachhaltend*” or “*Nachhaltig*” (longevity) from the book *Lyra*, by Carlowitz, in 1713, in French “*durabilité*” (durable) and in Dutch *duurzaamheid* and *Duurzaam* (sustainable).

The English term “*sustained yield*”, used since the mid-19th century, was a literal translation of the German word “*nachhaltig*”. The concept made its release in print in the book published in 1713, just over 250 years before the Brundtland Report. The “*Sylviculture oeconomica*” was the first comprehensive forestry manual, written by German Hanns Carl von Carlowitz, which dealt with instructions for growing wild trees. (GROBER, 2007 and PISANI, 2006).

According to Santos (*apud* Sgarbi *et al.*, 2008), theoretical studies on sustainability began in the field of environmental and ecological sciences, bringing to the discussion contributions from different disciplines, including Economics, Sociology, Philosophy, Politics and Law. . However, from 1960 onwards, environmental sustainability came to occupy a prominent place in the academic and political field, promoting discourse that involves issues of environment and social development in the broadest sense.

Over the years, the word sustainability has been highlighted in the national and international scenario, due to the gigantic environmental problems that have occurred all over the planet. The aggressive way of human beings with nature, increasingly seeking the exploitation of natural resources to satisfy their needs, without the perception that resources are finite and necessary for the survival of the human race.

The Latin dictionary by Castiglioni and Mariotti (1981) establishes the term “*sustinere*” (sustainable) as: to defend, maintain, assume, support, among others. According to Cavalcanti (2003), sustainability means the prospect of continuously obtaining equal or superior living conditions for a group of people and their successors in a given ecosystem.

Horbach (2005) and Dempsey *et al.* (2011) point out that sustainability is the meeting of three types of preferences simultaneously and in balance, reaching the environmental, economic and social aspects. In the view of Barbosa, Drach and Corbella (2014), sustainability is understood as a process of change through long-term social learning.

In this sense, sustainability is the solution for creating a new awareness in each individual, aimed at a gradual improvement in the environment. The term sustainability can be said to mean:

[...] the set of processes and actions that are intended to maintain the vitality and integrity of Mother Earth, the preservation of its ecosystems with all the physical, chemical and

ecological elements that enable the existence and reproduction of life, the meeting the needs of the present and future generations, and the continuity, expansion and realization of the potential of human civilization in its various expressions. (BOFF, 2012, p. 14).

as well :

[...] constitutional principle that determines, with direct and immediate effectiveness, the responsibility of the State and society for the solidary realization of material and immaterial, socially inclusive, durable and equitable, environmentally clean, innovative, ethical and efficient development, in order to to ensure, preferably in a preventive and cautious way, in the present and in the future, the right to well-being. (FREITAS, 2012, p. 41).

Sustainability, according to Ayres (2008), is seen as a procedure of norms in which human beings must act in relation to nature and care for future generations. In studies by Lozano (2012), sustainability is appropriate for economic growth, based on social justice and efficient use of natural resources .

Finally, to understand the definition of sustainability, it is necessary to connect the term to its etymology. It is a concern that hovers in all social levels. A reality that allows, or even forces humanity to rethink its attitudes and design new paths. It can be said that sustainability is the ability of a process or form of resource appropriation to continue to exist for a long period of time. This leads to the expression of sustainable development.

2.2 CONCEPT OF SUSTAINABLE DEVELOPMENT, ECONOMIC GROWTH AND THE CHALLENGES OF THE 21ST CENTURY

The expression sustainable development (SD) shows a broader perspective. It emerged as a new concept that seeks to make development compatible with the economy, involving economic, social and environmental variables, indicating a path to be followed by developed and developing countries.

Concern for the environment was more intense when the First United Nations (UN) Conference on the Impact of the Environmental Development Process took place in 1972 in Stockholm, Sweden. According to Almeida (2002), during the Stockholm UN Conference, there is a growing discussion among nations on how to seek to reconcile economic activity with the preservation of the environment.

With the need to find a promising path to develop with sustainability, the planet needs urgent advances. However, it was from 1987, in Norway, that the World Commission on Environment and Development, presented the Brundtland Report, also known as “Our Common Future”, which defines sustainable development as “development that meets the needs of the world”. present without compromising the ability of future generations to meet their own needs”. (SCHRAMM; CORBETTA, 2015, p. 34-35).

The report starts from a complex view of the causes of the socio-economic and ecological problems of global society. It highlights the correlation between economy, technology, society and politics and alerts to a new ethical posture, based on responsibility both between generations and between members of today's

society. It sets goals to be achieved at national and international level, including the adoption of strategies for sustainable development and the protection of ecosystems.

On the other hand, in the understanding of Buarque (2002, p. 58), sustainable development “spreads as a differentiated development proposal” demanding new conceptions and perceptions organizing “a new attitude of society in the face of present and future challenges.”

However, for Becker (2008, p. 103), development has an adverse character, since “at the same time it is development for some, and not development for others”.

According to Elkington (2001), the SD issue goes beyond an environmental or economic issue, but a social issue. In this sense, it is contextualized that economic activity, environment and society form the tripod on which the concept of sustainable development is based.

According to Almeida (2002), the great difficulty is not in creating the concept of sustainable development, but in putting it into practice, because it involves a change in the culture of the organization and its employees, in addition to demanding time and financial resources.

The expression sustainable development characterizes a development model that aims to articulate the economic, social and political progress of national States with environmental preservation, taking into account the limitation of most natural resources that society makes use of.

In this sense, the DS has become indispensable for the survival of companies and planet Earth itself. A company that aims at sustainability must be transparent and capable of evaluating its socio-environmental performance. The best way to do this is through the annual sustainability report, where it is possible to assess and monitor the trajectory of sustainability or, who knows, find the right path (ALMEIDA, 2022).

In view of this, many assume that economic interests and environmental interests are in conflict. Therefore, placing economic development and the environment on an equal footing as central parts of the same equation, supported on the one hand by organizations and on the other hand in the construction of efficient public policies, will lead to sustainable economic growth.

The debate on economic growth (EC) and economic development (ED) is broad and has different approaches to the subject. However, on one point there is no disagreement, the reduction of poverty and inequality are key factors to achieve the development of a given place. The concept of EC is understood as a continuous increase in gross domestic product, both in global terms and in per capita terms, it is a necessary, but not sufficient, condition for development to take place, as this must be understood as a multidimensional process, analyzing living conditions and not just income (RAY, 1998).

Economic growth, in Miller's understanding (2007, p.6), consists of the “increase in a country's capacity to provide goods and services”. However, for May (2003, p. 6), the idea of SD consists of a normative concept that emerged in a scenario of divergences on the relationship between economic growth and the environment, intensified mainly by the publication of the Club of Rome report. , which preached zero growth as a way to avoid environmental catastrophe .

The definition of a new development model for the 21st century, reconciling the economic, social and environmental dimensions, emerged to resolve, as a conceptual starting point, the old dilemma between economic growth and poverty reduction, on the one hand, and environmental preservation of another. Divergences that exceed more than twenty years, in open hostility against the environmental movement, while the latter, in turn, saw the DE as naturally harmful and entrepreneurs as its most representative agents (CAMARGO, *et al.* , 2004).

To alleviate this impasse, the World Commission for the Environment and Development of the United Nations, prepared the document called “Our Common Future”, also known as the Brundtland Report, in which the signatory governments that have committed to promoting economic and social development in accordance with environmental preservation (CMMAD, 1987).

At the beginning of the 21st century, Brazil built a period of EC induced by social inclusion policies. It is proving to be a fruitful period with regard to issues related to development, where the very concept of development is being rethought, since for centuries the dimension of economic growth was used as the main parameter.

It is in the incidence of the management of a sustainable world that organizations overlap, aiming at goals for the future of generations. Rio+20 was a reflection of twenty years of challenges for social, economic and, above all, environmental issues (AUMOND, 2012).

In the last decades, the planet has undergone profound environmental transformations as a result of an intense industrial revolution for a privileged few, which are affecting everyone more intensely, resulting in climate change, which causes natural tragedies more frequently.

In this sense, the world has been discussing the consequences of these impacts on the planet over the years and their possible solutions. These discussions were materialized in conferences in Stockholm (1972), Rio de Janeiro (1992, 2012), Paris (2015), among others. All of these were essential works for sustainable growth, such as the Brundtland Report (1984), Agenda 21 (1992), Kyoto Protocol (1997) and Agenda 2030 (2015), but with few actions for civil society, which claims for faster and more concrete practices, ignored by several governments (BRUNACCI; PHILIPPI JR, 2014).

Recently, in November 2021, the United Nations Conference on Climate Change - COP-26 took place in Glasgow, Scotland. The objectives of COP-26 highlight the quest to neutralize harmful gas emissions to planet earth, limiting global warming to 1.5°C, another important point is the protection of ecosystems in countries affected by climate change, another A highlight are the funds to finance the established goals and, finally, unite governments and societies in order to put into practice the Paris Agreement in a more expressive way.

Governments are expected to seek to create efficient public policies in partnership with social organizations and society to obtain economic growth through sustainable development.

2.3 NOTIONS OF PUBLIC POLICIES

At first, bringing a notion of the concept of Public Policies, Almeida (2016), points out how State Policies, the involvement between powers and procedures within the governmental structure are composed of stages of studies, research, economic and social analysis, bringing the effects budgeting and planning, in the search for changes in society's diverse agendas. Complementing, Cohn (2008), infers that public policy refers to the exercise of decision-making power carried out by the State, in the face of competition to achieve the collective interest.

According to the technical material, produced by the Federal Audit Court (TCU), used in the evaluation of public policies, it is understood that: "Governance in public policies refers to the institutional arrangements that condition the way in which policies are implemented". formulated, implemented and evaluated, for the benefit of society" (BRASIL-TCU, p. 34, 2014). Furthermore, in the fabric of public policies, the interrelationship between target audiences is aimed at the same purpose. The help between these demonstrates a central question of explanation for the success or failure of a policy (HILL and HUPE, 2002). It makes clear the understanding that there is no construction of a project that seeks to meet social demands, without the population being involved directly or through representation.

Public policies are integrated into the balance of supply and demand, resulting from the innovation process. Instruments aimed at tax incentives, access to financing, policies for the improvement and protection of human capital, support for entrepreneurship, stimulus to demands and schematization of public purchases are contained in the aspects of objectives and consequences in the idea of expanding access and demands for innovation, accessibility of technicians and development of professionals in the area (LEAL and FIGUEIREDO, 2021).

Marini and Martins (2014) conceptualize that the association of governance and public policy comes from the ability to govern through a collaborative scheme seeking results in the consequence of generating collective sustainability. Furthermore, there is complexity in the execution of public policies, so it is interesting to have a good correlation between users and the government hierarchy.

Therefore, it is clear that the interference of governmental functionality is the primary part in stimulating and editing projects of common interest to the affected community. It is about politics in a collective way, so that strategies are planned and executed on a concrete basis, with social participation, being directed by the power of the State.

2.4 GOVERNANCE CONCEPTS

"Public governance proposes to reduce the distance between public power and society, offering broader purposes, where society, the final recipient of the public services and goods offered, places itself in a participatory position vis-à-vis the government" (CARNEIRO NETO *et al.* . . , 2019, p. 464).

A recent study brings up the concept of Governance as a guiding function supported by a management mechanism. It involves environmental assessment actions, between scenarios and alternatives,

projecting results. The idea of governance is intended to guide policies and planning based on the demands and interests of the State. And finally, evaluate the results according to the established objectives (BRASIL-TCU, 2021).

The public power is responsible for guaranteeing transparency, efficiency and agility in the constitution of institutionally legitimized policies that stimulate competitiveness, economic development and innovation in cities so that they can be considered smart cities.

to Caragliu *et al.* (2011), a smart city is shaped by managing natural resources through integrated governance with social participation. Containing investments that seek economic growth, sustainability and quality of life.

Recently, in a study carried out through a systematic review of the literature (RSL), researchers understood that little by little aspects of governance and democracy are included in the discussion of smart cities, relating terms other than territory, technology and public policies, only (LEVY ; CARVALHO; ALOE; BEZERRA, 2021).

According to Chourabi *et al.* (2012), it is interesting to carry out a work structuring, with techniques, tools and concepts capable of analyzing local government initiatives. Factors such as management, technology, economy, environment, politics and also governance are points of reflection for the designation of smart city. In the case of Brazil, it is clear that studies on smart cities are guided by two-way parameters. One where there are technological implementations and the other which describes about installations of smart city developments. (BORJA and GAMA, 2014; GAMA *et al.*, 2012; WEISS *et al.*, 2017).

Despite the constant characteristics involved by the technological factor, there is a need to propose innovative public management for these cities, based on governance models (MADEIRA *et al.*, 2017).

In view of this, it is understood that it is necessary to bring to local administrations, government actions that seek innovations, through work with local communities. The defended discussions report that public policies can be integrated to the various segments within a geographic space. Government programs are parameter points for evaluating the impacts they cause in prominent cities.

Demonstrating the concept of Public Governance, it is indicated that the expression comes from the English, *corporate governance*, which in translation into Portuguese, refers to corporate governance. To address the Brazilian State, Corporate Governance is defined as the systematization by which institutions are managed and controlled through relationships between owners, managers and other components of the organizational structure. The practices are aligned with the interests of the organization in order to achieve the proposed objective to contribute to the continuity of the entity (INSTITUTO BRASILEIRO DE GOVERNANÇA CORPORATIVA – IBGC, 2009).

For the Securities and Exchange Commission (2002), governance is composed of a grouping of practices that seek to improve the performance of an organization to protect and facilitate access to assets, for the users directly involved. Corporate governance principles are sets of values and regulations that are

based on the idea of guiding management in meeting the demands of a company's owners. Transparency, equity, accountability and discipline are fundamental parameters (CARVALHO, 2002).

It is in line with corporate governance in the government sector, the perspective that the structure of actions is objective, with aligned responsibilities, easy-to-understand relationships between the parties involved, and also with the allocation of resources and delivery of results together with the due support to higher administration (MARQUES, 2007).

Bringing the definition established in a normative act on the governance policy within the scope of the federal public administration, which extends to other federative entities, in a generic way, thus being able to infer. Decree No. 9,203, of November 22, 2017, in its article 2, item I, points out that public governance is: “a set of leadership, strategy and control mechanisms put in place to evaluate, direct and monitor management, with a view to the conduct of public policies and the provision of services of interest to society.”

In addition, the aforementioned decree establishes, among others, public governance guidelines on the search for results for society, with the aim of finding timely and innovative solutions that are capable of adapting to resource limitations and establishing priorities. It also contains indications for modernizing public services, articulating integration processes between different spheres and levels of government; the search for evaluations of proposals for the creation or improvement of public policies, updating normative acts based on good practices, linked to legality, but with the aim of reducing bureaucracy and strengthening the population's access. Therefore, it is important to understand the need to create partnerships with the private sector and civil society.

Public administration is the functional structure for the execution of services, in order to meet the demands of the population, being an organization that is based on the practices of actions and services of policies by the government. The role of the State is necessary for the service par excellence with the development of political power (MATIAS-PEREIRA, 2018).

The TCU, in a publication of a basic governance reference applicable to public organizations, structured a relationship between governance and management, which involves 03 activities, namely: evaluating; direct and monitor, for governance; and plan, execute and control, for management. The model adopted by the body seeks to design an information mechanism that subsidizes governance instances. (BRAZIL-TCU, 2020).

In the public sector, favoring the construction of a model of public management management resulted from the decay of the bureaucratic model, as the recent objective is to make the State more efficient and able to meet the demands with better services provided to society (MATIAS-PEREIRA, 2018).

Government administrations where there are measures based on the formatting of renovating executions, manage to practice management tools and techniques arising from concepts in the literature or from concrete proposals for government policies. The need for a management that can carry out the projects,

must explore control and monitoring instruments. So that, in the face of possible adjustments, adjustments are made through real decision mechanisms and based on the established planning.

Discussing governance corresponds to terms of public policies, these as a set of actions outlined in the idea of influencing and improving the situation of a population (MARTINS, 2007). For Procopiuck (2013), administrative mobilization must articulate the application of resources in the prospect of solving collective problems.

Finally, it should be noted that the treatment given to the set of management mechanisms, based on methods of applicability in governance, are integrated in the conduction of pioneering and outstanding public policies. Characterizing modern and differentiated management practices are attitudes that demand communication, research, creativity and integration among the sharing of interests. It became clear that it is important to have a planning project, whether based on problems or a willingness to change. The construction of contemporary management policies is influenced by a government model that innovates and brings effective results to community demands, aimed at economic development and smart cities.

2.5 SMART CITIES, DEFINITIONS AND CHARACTERISTICS

When faced with the term “Smart Cities” it is possible to have a direct relationship with the technological aspects. Perhaps, in a simple questioning of society, the technology factor comes to the fore, as it has a broad focus that intelligence corresponds to machines, robots, software, and the like. However, several studies and research on the subject show that the classification of cities, as a geographic space, has the criterion of intelligence in different circumstances, and by social, environmental and management attributions.

A smart city is so called when it portrays management, policy, and technology innovation. Being a practical workshop, where risks and achievements are involved (NAM and PARDO, 2011). The expression “smart cities” appears in a study of pioneering practice in the city of Singapore, whose purpose was to become an innovative city (MAHIZHNAN, 1999). In other researches, the concept is treated as innovative technologies, applied in the urban scenario, and also in techno-centered public management (LIU *et al.* , 2010; KUIKKANIEMI *et al.* , 2011; NAPHADE *et al.*, 2011).

With the constant increase in the urban population, various social, economic and institutional demands and difficulties are accelerating. Various managements such as solid waste, traffic and transport, natural resources, environmental pollution, and socio-economic inequality tend to affect political and sustainable aspects of cities (NEIROTTI *et al.* 2014). Innovations arising from technological factors, with new advances in urban planning and customs, prospect future possibilities and availability for metropolitan cities (COURABI, *et al.*, 2012).

The technology factor in the exposed characteristics of smart cities is remarkable, being the aspect of urban development and government management. It is noticed that technology is a tool for exploring other technical sources to compose the structuring of an innovative city. Solutions that meet social and

economic needs are factors that awaken innovative and sufficient practicability. In the topic that deals with data analysis, concepts and applicability on the conditions of certification of smart cities will be addressed, which are conditional on good management practices, an instrument that relates to innovative, feasible and sustainable proposals.

3 METHODOLOGY

This article adopts scientific classifications from the perspective of answering the problem in question, together with the purpose of achieving the objectives proposed in this study. For that, Gil (2008) manages to classify the research in terms of nature, in pure or applied. In this article, it is directed towards applied research, as the practical characteristics seek to solve an obstacle within the real context. This article aims to demonstrate and evaluate the indicators and data on the ranking of smart cities on the governance factor and its relationship with public policies and sustainable development that expresses collective feelings of freedom and democracy, with which the world has passed. to question and rethink a future for the common good.

Therefore, regarding the objective, the research is related to the descriptive type, where the analyzed facts are recorded and reported, without manipulation, demonstrating the characteristics of the population or phenomenon studied. This type is the factor of explanation and interpretation of the facts found (PRODANOV and FREITAS, 2013). The results topic describes the data extracted from *Connected smart Cities* (CSC), 2021 edition, regarding the position in the governance *ranking* , presenting the respective notes and demonstrating in a practical way the evaluation of the elaborating organization.

As for the approach, this research is classified as qualitative, it studies the subjective, social and human behavior aspects, seeking to interpret the concepts, which identifies that a certain city is called Smart Cities, and to clarify their characteristics within the scope of organizations that certify them (MIGUEL, 2018). Finally, regarding the method, bibliographic and documentary research were used, which for Yin (2015), respectively, seeks to explain a case in the face of the theoretical survey of scientific publications and the type of research that is based on primary data not yet explored by science .

The investigation strategies were based on the interpretation of concepts, collection, recording, analysis and interpretation of data on how governance contributes to the sustainable development of smart cities in the Northeast region of Brazil. The study was based on three aspects: *I*) on the bibliographic research of the theme to support the analyses ; *II*) in searching for secondary data, such as information on the *Connected website smart Cities* (CSC), and finally; *III*) interpretation of data from the CSC's annual report on the Governance axis.

order to achieve the objective of the investigation, the concepts of sustainability, sustainable development, economic growth, challenges for the 21st century, public policies, governance, and finally, smart cities were sought. Based on the concepts, the research investigates the interpretation of the various

authors on the subject in order to understand how governance contributes to the sustainable development of smart cities in the Northeast region of Brazil.

Based on the CSC's 2021 Annual Report, the ranking on the governance axis was analyzed in three aspects: first, referring to the ranking of the top 10 smart cities in Brazil. Then, the 10 cities considered smart in the Northeast region of Brazil were analyzed and, thirdly, the cities classified as smart in the State of Pernambuco.

To describe and demonstrate the positions of smart cities and their respective scores, data was collected from the *Connected Platform smart Cities*, version 2021. The study was commissioned by *Companhia Urban Systems*, through the annual report, which details all Brazilian cities, ranking the 100 smartest cities, on various social, sustainable and management factors. In this research, data were collected through consultations, by filtering among Brazilian cities, delimiting the Northeast region of Brazil, specifying the State of Pernambuco, from the perspective of the governance axis.

4 RESULTS AND DISCUSSIONS

To achieve the study objective of this research, it will be evaluated how governance contributes to the sustainable development of smart cities in the Northeast region of Brazil.

According to Souza and Menelau (2018), the topic of Smart Cities is on the rise among the agendas of discussions on collective demands of a society, interacting with factors of information, technology and sustainable management of cities. Smart Cities rankings arise from comparative studies, evaluating and classifying cities under different dimensions and indicators.

Connected ranking is presented. *smart Cities* (CSC), in Brazil it is demonstrated by the *Urban Systems organization*, which behaves like a company focused on planning studies supported by smart cities concepts. The studies have the purpose of dimensioning the strategy of economic development, social improvement and environmental protection in the cities. (I think here we have to talk about the origin of the ranking, I understand leaving this one)

The CSC encompasses private organizations, governments and entities through a platform in order to seek innovation and improvements for smart cities, and the harmonization between them. As its mission, the CSC provides discussion and sharing of information and ideas between organizations and social needs. There is still a search for principles of integration, innovation, collaboration, transparency and focus on people. Finally, the ranking aims to map the cities with the greatest potential for development in the country. In this *ranking*, the indicators serve to qualify the equally smart cities in Brazil, using 11 distributed axes, they are: mobility, environment, entrepreneurship, education, energy, governance, urbanism, technology and innovation, health, safety and economy.

All academic research goes through a data collection process. In the research carried out by the CSC, 75 indicators were used, all indicators used in the CSC are presented in detail on page 109 of the CSC report, 2011 edition, the highest number among all versions of the study. The Connected ranking smart

Cities is mostly carried out through secondary data collection, and thus, the new availability of surveys, data and ease of access, as a result of the evolution of the open data policy, allowed a deeper change in the 2021 edition of the study. (CSC, 2011).

According to the CSC (2021), the CSC ranking uses a weighted comparative analysis methodology, thus, the result of each city evolves with each edition according to the evolution that the municipality presented in the analyzed indicators; the evolution presented by the municipalities in close positions; to changes in the metrics of the indicators; the insertion of new indicators and the removal of indicators.

Among the bases for evaluation, it is worth highlighting the ISO 37120 and 37122, published by the Brazilian Association of Technical Standards, standards that together guide the definitions and methodologies for indicators aimed at urban management and implementation of public policies for smart cities. Directing the focus of this article, ISO 37122 – *Sustainable cities and communities – indicators for smart cities*, consists of 80 indicators, according to specific axes. Delimiting the objective of this work, the Governance axis is pointed out, which in turn has 04 indicators (CONNECTED SMART CITIES, 2021).

As a methodology applied to prepare the *ranking*, the company *Urban Systems* adopts its own method of weighting indicators, called the Market Quality Index (IQM). This is calculated from information that varies according to the nature, complexity and units of measurement. There are interspersed factors for the computation of the final grade. First, the relevance factors, where the indicators have a direct and indirectly proportional influence. Relevance weights are also followed and finally the calculation is performed. The calculation takes into account the weighted value in each segment in each city, and the relation to the minimum and maximum amounts observing the other cities.

Considering the entire universe of Brazilian cities, this classification adopts a sample of cities with more than 50 thousand inhabitants, according to an estimate extracted from the Brazilian Institute of Geography and Statistics (IBGE). For this edition, there were a total of 677 municipalities. The distribution among the population occurs in 03 divisions: from 50 to 100 thousand inhabitants, 100 to 500 thousand, and more than 500 thousand inhabitants.

On the axes, the CSC *ranking* (2021), adopts 11 sectors with the purpose of mapping the potentials of Brazilian cities, through indicators of intelligence, connection and sustainability. According to *Urban Systems*, in the 2021 version, the survey had 75 indicators. These indicators are built in an integrated manner between thematic meetings bringing together organizations, specialists, civil society and the public sector. Nevertheless, this article, with the idea of meeting the research objective, focused on the Governance axis (GOV), so only the indicators related to the axis under study will be explained here.

According to the CSC report (2021), the information treated and disclosed results from a survey of secondary data extracted from an open database, from entities and other technical institutions. In the Governance *ranking*, the composition is based on 12 indicators, which are: 1) Mayor's education; 2) Firjan Index; 3) Transparent Brazil Scale; 4) Citizen Service via app or website; 5) Advice; 6) Land use and occupation law; 7) Expenses with urban planning; 8) Risk area monitoring; 9) Health Expenses; 10) Infant

Mortality; 11) Security Expenses and 12) Education Expenses. In general, the names of the indicators are already self-explanatory .

Finally, the *ranking* is demonstrated through the consolidated report of the evaluated axes. The consultation of the result is available directly on the online platform. In this instrument it is possible to collect general data, at the level of Brazil, by region, by State, by city size and by thematic axis, and there is also access to indicators for each demonstrated city. In the last edition, Urban Systems manifested itself on an online platform, in PowerBi format , filtered in ordered tables based on the survey clipping.

Starting from the extract on Governance, the focus of this study, the CSC *ranking* is made up of 12 indicators, 05 of which are linked to the governance axis itself. Corresponding to the score on the axis in question, there is a maximum limit of 11.50 points, with weights between 0.5 point for the mayor's education; 1.0 point for the other indicators, which for now will not be explained in this research. Among the Governance indicators, there are factors such as the transparency of the municipality, social participation, and levels of municipal development and training of the municipal manager. It is important to point out that the details of the 12 indicators are not the objective of the study, but it is worth pointing out that there is this amount for the composition of the final grade for the respective axis. In this last edition there was the insertion of a new indicator, taking modalities of remote service for the population, being therefore: applications created by the city hall; applications developed by third parties based on city hall data and yet another website tool for mobile devices (CONNECTED SMART CITIES, 2021).

Table 1 below shows the ranking of the 10 smartest cities in Brazil, based on the extraction of the CSC *ranking* (2021). After that, it is possible to clarify that the 10 smartest cities in the country are located between the South and Southeast regions, with scores from 7.661 to 8.477 in the 10th to 1st place in the ranking. Therefore, in this position of the top 10 smart cities, the municipality of Niterói (RJ) is in 1st place, followed by Balneário Camboriú (SC), and Praia Grande (SP), in 3rd position. In 10th position was the State of São Paulo, with the city of Paulínia. The other positions of the top 10 are tabulated in table 1, with their respective scores for the Governance axis.

Table 1 - Smart Cities in Brazil - 2021 - Overall Ranking - Governance

Position	Municipality - UF	Spots
1st	Niterói – RJ	8,477
2nd	Balneario Camboriu – SC	8,332
3rd	Praia Grande – SP	8,035
4th	São Caetano do Sul – SP	8.016
5th	Limeira - SP	7,902
6th	Caraguatatuba - SP	7,853
7th	São Bernardo do Campo – SP	7,740

Position	Municipality - UF	Spots
8th	Blumenau - SC	7,690
9th	Vitória - ES	7,670
10th	Paulínia - SP	7,661

Source: Connected smart Cities , 2021- adapted by the authors

However, the CSC (2021) classifies the 100 Brazilian cities in the intelligence level, and according to the survey of the report in the general classification, that is, between the 1st and 100th city of the ranking in Governance, it is shown that there are 15 cities in the Northeast region. in the total amount of 100 smart cities, and among these, there are 05 municipalities in the State of Pernambuco. It should be noted that these data on the position by segregation, delimiting the Northeast region and the State of Pernambuco, will be explained in the tables below.

Table 2 shows the ranking of the 10 smartest cities, which are located in the Northeast region. In 1st place in the region is the city of Fortaleza (CE), with a score of 7.423, Salvador (BA), with a score very close to the previous one, with 7.421 and in the 3rd position is a city in the State of Pernambuco, Ipojuca (PE), with a score of 7,237. It is noted that of the 10 cities presented in this clipping, the largest amount per state was Pernambuco, contributing with 03 municipalities: Ipojuca, Recife and Caruaru, respectively in the 3rd, 4th and 8th smartest cities in the Northeast region.

Table 2 - Smart Cities in Brazil - 2021 - Northeast Region - Governance

Position	Municipality - UF	Spots
1st	Fortaleza - CE	7,423
2nd	Salvador BA	7,421
3rd	Ipojuca - PE	7,237
4th	Recife PE	6,900
5th	Porto Seguro - BA	6,829
6th	João Pessoa – PB	6,770
7th	Teresina - PI	6,760
8th	Caruaru - PE	6,632
9th	Empress - MA	6,598
10th	São Luís - MA	6,586

Source: Connected smart Cities , 2021- adapted by the authors

In terms of the best-ranked cities, in the Governance axis, and by region, the city of Fortaleza (CE) stands out, which ranked 15th in the general ranking of the country, and obtained a score of 9.9 in the aspect of Public Transparency and Service to society through an application and website.

Bringing to a specific delimitation in the State of Pernambuco, the CSC ranking (2021) discloses five smartest cities among municipalities in the State. Table 3 shows only 05 cities, because in the classification for this state of the federation, only these reached the criteria for positioning in the Governance axis, so in this table it was not possible to show 10 positions as in the two previous tables.

Table 3 - Smart Cities in Brazil - 2021 - Pernambuco State Ranking - Governance

Position	Municipality - UF	Spots
1st	Ipojuca - PE	7,237
2nd	Recife PE	6,900
3rd	Caruaru - PE	6,632
4th	Jaboatão dos Guararapes - PE	6,573
5th	Cabo de Santo Agostinho - PE	6,318

Source: Connected smart Cities , 2021- adapted by the authors

In this third frame, they are in chronological order, from the first to the fifth city: Ipojuca, Recife, Caruaru, Jaboatão dos Guararapes and finally, Cabo de Santo Agostinho. As for the grades, they were respectively 7.237, 6.9, 6.632, 6.573 and 6.318. The scores were then on average from just over 6 to over 7. Finally, transforming into percentage terms, as to the representation for the maximum score on the axis under study, it can be seen that the municipality of Ipojuca reached 63% in relation to the maximum score, and the city of Cabo de Santo Agostinho, reached 55% of the total of 11.9.

5 CONCLUSION

This research sought to assess the relevance of the contribution of governance aspects to the development of smart and sustainable cities located in the Northeast region of Brazil. As a basis for the relationship between governance and sustainability, concepts of sustainability, economic growth, economic development, challenges for the 21st century, public policies, governance and above all smart cities were discussed. In this research, the parameters that define the sustainability characteristics were demonstrated, that is, the so-called “smart cities”.

All the harmonization presented by the concepts reflects in new interpretations of the nomenclatures and linkages of the characteristics present in the classifications of smart cities. The idea of a smart city is directly linked to the technology factor that is no longer predominantly supported.

Secondly, the research focused on demonstrating the positioning of smart cities within the Northeast region of Brazil, highlighting the main positions in the *ranking* prepared by the company *Urban Systems* ,

through *Connected smart cities* (2021), among the first placed in the State of Pernambuco. Data extraction took place through the collection of data from the annual report, for the year 2021, made available on the website of the organizing company.

Integration with the influence resulting from environmental behaviors results in the search for new methods of planning and executing public policies. Decision-making by State agents requires technical information to search for better results for society.

Considering that the aspects presented in the CSC report (2021) are derived from data from public policy executions carried out by the cities listed in *the ranking*. This study explained that in the Brazilian panorama, the top 10 smartest cities are located in the South and Southeast of the country. However, directing to the objective of this research, in the Northeast region of Brazil, it was identified that the smartest city in this region was the City of Fortaleza, capital of the State of Ceará. Being the State of Pernambuco, with the largest number of cities classified in *the ranking* among the 10 smartest cities flagged in this article in relation to the Northeast region.

Although several editions of the CSC *ranking* (2021) have undergone improvements in the integration and availability of smart cities data, according to the annual report, there is still a lack of quality and access to the information that make up the factors of the axes raised in *the ranking*. As is pointed out in the results and discussions section of this article, the data is secondary. And the aforementioned annual report does not show about the exploitation by municipal administrations of the indicated data, and also the non-use of management tools for new creations of public policies and social and sustainable involvement.

For future research, it is suggested the need to investigate the use by municipal managers and public agents of this data, being able to structure indicators for monitoring public policies.

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CHAPTER 62

Efficiency of energy actions under the pbe- edic and its impacts on _ brazil us last 11 years 1

 [10.56238/pacfdnsv1-062](https://doi.org/10.56238/pacfdnsv1-062)

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ABSTRACT

This paper describes the national impact of National investments on the PBE-Edifica program context, in the last 11 years. A survey was carried out with the

R3E integrant, INMETRO, ELETROBRAS, and FISP, organized in main actions of building energy efficiency, public investments in building energy efficiency, energy labelling offices, and buildings labelled. As a result, 1126 professionals were trained and buildings all around the country were labelled, made possible by the labelling offices and laboratories sponsored by ELETROBRAS. In conclusion, such a legacy was only possible due to the State investments, by ELETROBRAS, considering that it is a new market and affected by the economy.

Keywords: Building Energy Efficiency, PBE-Edifica Label, Labeling office.

1 INTRODUÇÃO

It is estimated that worldwide The construction civil consume in between 40% and 75% From resources (MENDES, 2013) and produces about 39% of global gas emissions carbonic (CO₂) (UNEP, 2017). Part of those emissions it is associated to consumption in energy us buildings and The headquarters energetic worldwide at which 86% are energies no renewables (EPE, nd). In Brazil, residential and commercial buildings were responsible for 48% of electricity consumption in 2018 (EPE, 2019). Although only 19.7% of the country's electricity matrix is associated with non- renewable (EPE, sd), O increase of consumption in energy implies at the use in sources not renovable. In addition to being identified as a source of CO₂ emissions , the construction is identified as the sector with the greatest potential for reducing these emissions (IPPC, 2007, apud, GONÇALVES; BODE, 2015). In terms of legislation, in the chapter SAW gives Constitution Federal Brazilian, O Art. 225 ratifies what "All has right to quite environment ecologically balanced [...] imposing to power public and to the community the duty to defend and preserve it for the present and future generations" (BRASIL, 1988), that is, the State has an important role in providing and guarantee means that enable the execution of this right. One of the measures of protection to environment It is, therefore, invest in efficiency energetic.

In 2001, Brazil went through an energy supply crisis. The answer, in October 2001, was the enactment of Law No. 10,295, which provides for "Policy National Conservation and Rational Use of Energy" (BRASIL, 2001). from that initiative, he was possible invest in efficiency energetic and create O Program Brazilian in Labeling (PBE). As a result, the PBE-Edifica Label is instituted to commercial, service and public buildings (BRASIL, 2009) and for buildings the residential (BRASIL, 2012). Since its publication, most of the studies focus a r a m a t a n a l i s e give _ method a val i a t i v o , The ex e m p l o of _ M a c i e l ; C a r l o (2011) , Rodrigues ; Days; Pedrini (2011) and Pacheco et al. (2012) and the evaluation system, like Pedrini et al. (2012) and Amorim et al. (2015). Also discussed was need in articulation of that instrument with you plans directors municipal and the insufficiency of the label's incorporation by the market (RODRIGUES et al. , 2019), considering that the competitive logic inherent to capital leads to the production of unnecessary goods, resulting in overproduction and waste, even in context in Marketplace green (BENSAIDE, 2017).

Thus, this article discusses the importance of the State in the actions of efficiency energetic at the scope gives tag PBE-Builds us last 11 years old and their impacts on the national territory. This article is the result of data collected carried out within the scope of the scientific initiation scholarship of the search "Process collaborative Multidisciplinary – buildings autonomous energetically to low latitude", which supported the development of doctoral research "The relationship between designers and consultants in the design in buildings, aiming O low impact

environmental and O attendance in goals in efficiency energetic at the context Brazilian", both developed at University Federal of River Great of North.

2 METHOD

The research is based on gathering information related to efficiency energy in buildings (3E), available from 2009 to June 2020, organized in five topics:

3E's main actions, based on the Efficiency Laboratories websites energy in buildings (LabEEE/UFSC) and O center Brazilian in Efficiency Energy in Buildings (CB3E/UFSC), and from the Comfort Laboratory Environmental (LabCon/UFRN);

investments public in efficiency energetic, second reports funds made available by the National Program for the Conservation of Energy electrical (PROCEL) us last 9 years old;

Accredited Inspection Bodies (OIAs) by the National Institute of Metrology, Quality and Technology (INMETRO), second Dice gives C o r d e n a t i o n _ G e r a l of _ Accreditation _ _ _ _ _ _ _ _ _ _ give _ I n s t a n d y o u _ _ N a c i o n a l of _ M e t r o l o g i a, Quality and Technology (INMETRO);

trained professionals within the scope of the Energy Efficiency Network of Buildings (R3E) during its term, 2010 to 2016, provided by Centrais Elétricas Brasileiras (Eletrobras) and by coordinators of the laboratories members gives R3E;

National Energy Conservation Label (ENCES), according to tables of issue in hang tags of INMETRO.

The energy efficiency actions were crossed with the economic data of the construction in order to contextualize the issuance of PBE-Edifica labels in the scenario national economy and by state. These data consisted in quantitative about the employability gives construction at the Brazil published fur Department gives Industry gives Construction and Mining (DECONCIC) gives Federation of industries of State of São Paulo (FIESP, 2019), between the years 2007 and 2018, and in the Domestic Product Gross in civil construction, from 1991 to 2014 made available by the Union of Industry gives Construction Civil in Are Paul (SINDUSCON, sd). No he was possible rise professional performance in the area of energy efficiency in the country because it is not made available us Advice in Architecture and urbanism and O Advice Regional in Engineering and Agronomy.

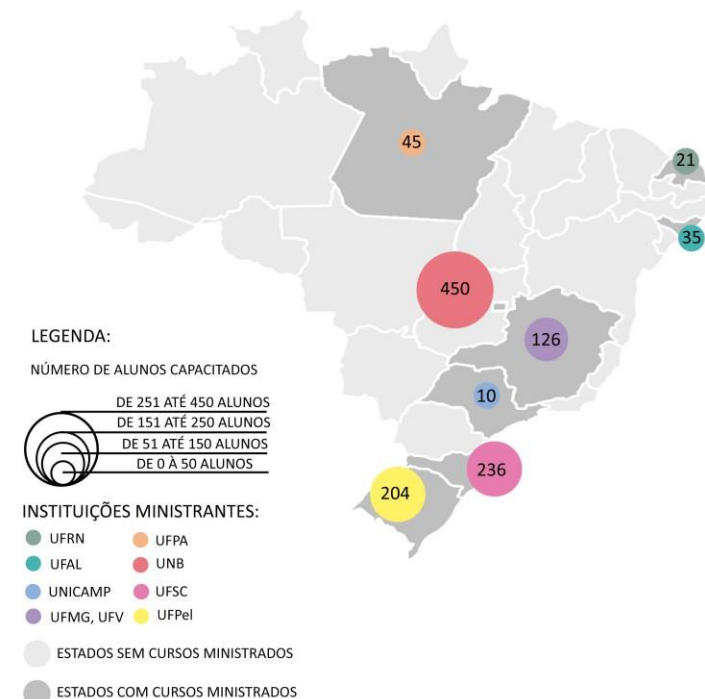
3 RESULTS

The actions aimed at 3E promoted by the Brazilian government, as a way of stimulate the production of energy efficient buildings, have consolidated mainly in the area of applied research, technological development and advice technique.

Among at actions in search stand out The creation gives R3E, of CB3E and of Project Energy Efficiency in Buildings (Project 3E). R3e operated from 2010 to 2016 and enabled financial contributions from Eletrobras to 12 laboratories distributed in five regions of the country. The Network was responsible for researching, articulating researchers, disseminate the PBE-Edifica Label, train professionals and form new bodies to issue in hang tags accredited (OIAs) fur INMETRO THE creation in OIAs also was articulated with an agreement between LabEEE and Fundação CERTI, first accredited body. Three OIAs were created by R3e, with the potential to formation in a bedroom. At the moment, three OIAs they are in operation (IN M E T R O , s.d) : _ O L I N S E / U F P E L c o n t i n u e a t i v o , u m _ The I A h e w a s s u s p e n s o , _ and O The I E D I F I C A / U F R N of u l u g a r The a w h a t t o d o _ _ H i , _ c r i a d o i n 2 0 1 9 , O H A B T - E D I F I C I O _ E F I C I E N T E A R C H U I T E T O S L T D . Only one OIA was created by private initiative, without government incentives. You too much emerged in universities federal (UF). Among at main difficulties faced by OIAs were financial unsustainability in the face of high costs in operation, The low demand per hang tags and, for you linked at UFs, The lack in resources institutional.

During O period in 6 years old, you members gives R3E made possible most in 41 courses 2 in PBE-Edifica labeling training, for more than 1126 students (Figure 1), among undergraduates and graduates at the Brazil, in addition of scope of your cities, in form what their formations may have been reflected in other cities, as was the example of University of Brasília (UnB) and the Federal University of Santa Catarina (UFSC), what ministered courses The distance.

Figure 1 - Students empowered per institution



Source: R3E and Eletrobras. note: elaborate by the authors (2020)

The creation of CB3E started in 2011, with one of the objectives of “Supporting technical and scientific to the PBE - Edifica, making its continuous improvement” (CB3E, nd)

and is the responsible for the new proposal for a regulation, which is in the process of being improvement after public consultation. The development of Project 3E grew out of initiative of Ministry in Mines and Energy and he was initiated in 2010 and finished in 2017, with O objective in to influence and to develop O Marketplace in efficiency energetic in buildings public and commercials (MMA, 2020).

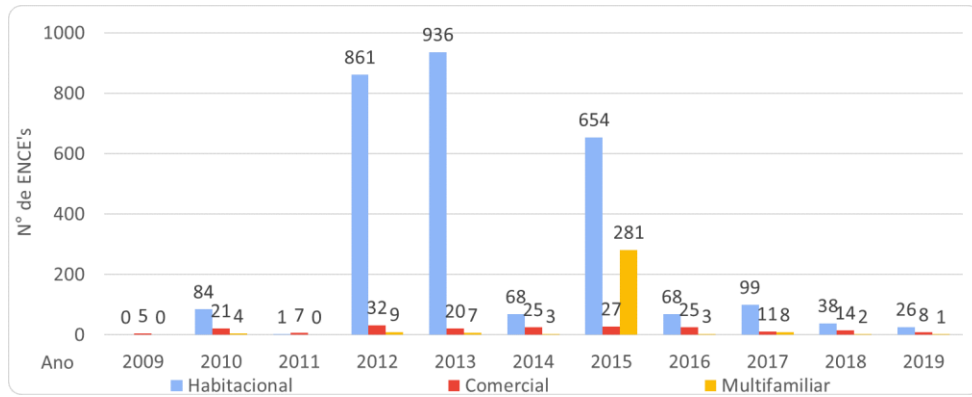
At area in development technological, meet at tools in simulation hygrothermal and energetic DOMUS (DOMUS, 2015), elaborate for the PUC- PR, and O Simulator in Efficiency energy in buildings (S3E) (LABEEE, 2020), created fur LabEEE, you which aim assistant at the process in labeling.

At area in advice technique, aiming your consolidation, were published recently two edicts: as O Program National in Conservation in Energy Electric (PROCEL) – Builds in 2018, which stimulated the promotion of projects commercial and residential buildings to receive the Procel Edificação Seal (ELETROBRAS, 2018) and the Nearly Zero Energy Buildings (NZEB) in 2019/2020, which aimed to contribute for construction in buildings with swing null in energy (ELETROBRAS, 2019).

THE Publication gives Instruction Normative IN 02/2014 (BRAZIL, 2014) became mandatory The labeling of public buildings financed with federal funds, from 500m². It is possible that this action has influenced the reduction of label emissions commercial, service and public sectors at a slower pace than observed in the buildings residential (Figure 2). THE reduction at issue in hang tags us years old following accompanies the retraction of approximately 21.6% in the number of occupations in the chain productive gives industry gives construction civil, The leave in 2014 (FIESP, 2019), well as the economic recession that was taking place in the country, with a drop of 3.5% of Gross Domestic Product (GDP) in 2015 (GAZETA, 2019). It is worth mentioning that until 2014, the GDP gives construction civil was in growth in Are Paul (CONSTRUCTED, sd).

two You values are approximate why no he was possible Access The totality of information about you courses and you students in all at institutions participants gives R3E.

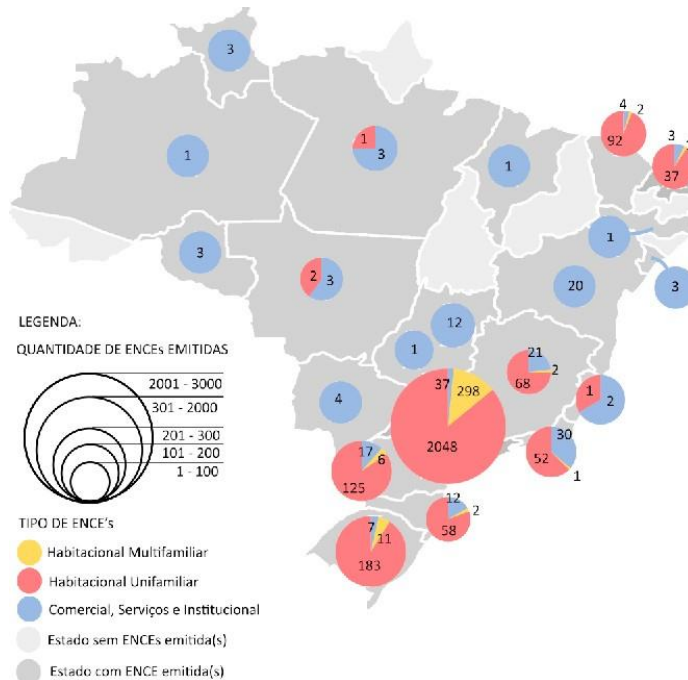
Figure 2 - Number of ENCE's issued per year



Source: tables of INMETRO (2020). note: Elaborate by the authors (2020)

Labeling is widespread in all regions of Brazil, with greater expressiveness at region Southeast, most notably at the state in Are Paul, what represents about 75% of the total ENCEs issued (Figure 3). This value is consistent with the predominance of civil construction activity in the Southeast region, which presents 44% of the works in the country, with the state of São Paulo being responsible for more half of the occupations in the civil construction production chain in this region. THE South region presents approximately 13.2% of the issued labels (Figure 3), followed by the Northeast with 5.2% of the tags; Midwest with 0.7% and North with only 0.3%.

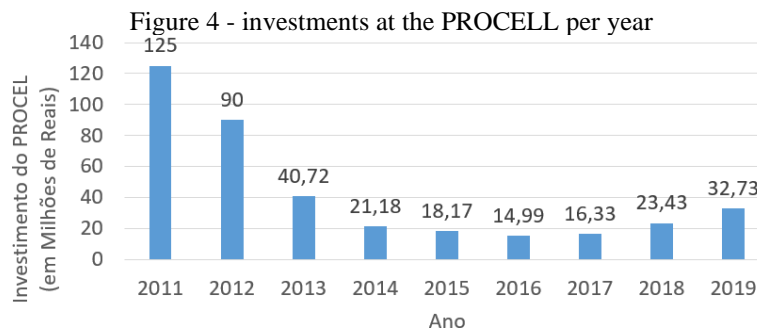
Figure 3 - Number of ENCE's issued by condition



Source : _ _ _ IN METER _ (2019) . _ _ No t to : _ _ and la bo r a d o hair _ au tor e s _ _ (2 0 2 0)

At actions in 3E were defrayed with resources gives electrobras, via PROCEL-Builds, and of Ministry in Mines and Energy, or be, with money public. You contributions financial in PROCEL reduced from 2011 to 2016 (Figure 4) and started a small recovery _ _ _ _ _ it is O the no _ of _ 201 9 , fact j us t i f i c a d o p and there _ the p r o v a t i o n _ _ and I saw you _ _ _ give _ read no . 13,280/2016 The which force what 20% From resources capitates by

companies in energy be invested at the PROCELL (PROCELL, 2020). At the however, O value invested for PROCEL-Builds still It is little expressive, 2.1%, of PROCELL in 2019 (ELECTROBRAS, 2020).



Source: electrobras (2020). note: elaborate by the authors (2020)

It is possible to notice that the 3E actions promoted by the State (Figures 1 to 3) enabled the implementation, dissemination and visibility of the PBE-Edifica Label, with the issue in ENCE's in all O territory national and The empowerment in professionals in all regions. However, from 2014 onwards, there was a significant reduction in resources invested (Figure 4) and a decrease in ENCES issued (Figure 2), demonstrating The inability of Marketplace in foment, per yes only, at actions in 3E. In part, this difficulty lies in the economic crisis, as presented in the Dice gives FIESP (2019), but It is required consider what O Marketplace if destined to profit and no The improvement gives quality gives construction and of quite environment, values incompatible in between yes (BENSALDE, 2017). That aspect reinforces The importance in if provide in the constitution the obligation of the State to preserve the environment, what runs through also, fur investment in actions in 3E.

4 CONCLUSION

The energy efficiency actions within the scope of PBE-Edifica, in the last 11 years, had larger visibility us periods in larger heating gives economy, in between 2011 and 2015, consistent with the production of civil construction. Without the investments of State, per quite gives ELECTROBRAS, no it would have been possible The creation of OIAs in the UFs and the issuance of ENCES, the more its greatest legacy, which is the amount of trained professionals, essential for the dissemination of energy efficiency in the country, essential at the time of resumption of production of buildings efficient, us molds gives Tag PBE-Builds.

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CHAPTER 63

Contributions to the planning study for the implementation of a 5G access network in a dense urban area in Natal

  10.56238/pacfdnsv1-063

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ABSTRACT

Mobile access technology has undergone a major revolution and popularization in recent years. Each generation of mobile technology has provided

significant performance improvements, with rapid changes in response to the demands of massively growing data traffic on mobile devices around the world. The fifth generation (5G) is built on three use cases: eMBB (Enhanced mobile bandwidth), URLLC (Ultra-reliable and low latency communication) and mMTC (Massive machine type communication). As the requirements of each use case are quite different, a 5G network of sufficient flexibility for the connectivity of existing and future services, which must be efficiently implemented in a single continuous block of spectrum or accurately in discrete blocks, using a carrier. The challenges for the evolution and deployment of 5G technology in Brazil regulatory and political issues, as well as the involvement of the effective network infrastructure. This case study presents performance results of a network evaluating the simulation of a 5G generation deployment scenario in a dense area in the city of Natal/RN, proposing a configuration formed by 4 macrocells operating at 700 MHz and a second network formed with addition of 39 microcells operating at 3.5 GHz. An evaluation carried out compares the results of coverage, SINR and capacity of both mobile networks, evaluating the challenges of transition from the current to the next generation of technology in face of the already existing access network infrastructure. The planned 5G network presented a performance compatible with what was expected in the NR standard, mainly in terms of capacity, as it reached rates around 100 to 200 Mbps in almost the entire coverage area.

Keywords: IMT-2020, Mobile Communications, Wireless Communications, Small cells, Microcells, 5G network.

1 INTRODUCTION

Currently, the world is witnessing a great evolution and popularization of telecommunications services and technologies, especially in the field of wireless communications with mobility. Cisco (Forecast, 2019) has estimated that data traffic on global mobile devices will reach 1 zettabyte by the end of 2022, which means 1 trillion gigabytes of data circulating over the network. According to this study, this type of traffic has grown 17 times in the last five years, and projections are that it will account for 20% of traffic in 2022, against 5% in 2010. The study also predicts almost 79% of traffic from The world's mobile

data will be video in 2022. This data growth over the last few years, mainly demanded by video, makes the use of current systems (3G and 4G) unfeasible, as they would not support such an increase in data traffic.

In this context, the fifth generation of mobile technology (5G) promises to revolutionize society in an unprecedented way, mainly due to the popularization of concepts such as the Internet of Things (IoT) and *Machine-to-Machine Communications* (M2M) (KINZA, 2020). On the other hand, users are becoming increasingly demanding in terms of connectivity, latency and speed, in services such as streaming, image and video sharing, which do not support failures, interruption or lack of signal. According to ITU-R (2015), 5G (IMT-2020 standard) is expected to support at least three use cases:

- *Enhanced mobile broadband (eMBB)*: addresses the growing demand for higher speeds and volumes of mobile data, covering a variety of cases, including wide area coverage and hotspots . The target is to reach 10 Gbps peak rate at the base station and around 100 Mbps per user;
- *reliable, low-latency communications (Ultra-reliable and low latency communications - URLLC)*: involves strict reliability, latency and availability requirements, providing, for example, telesurgery and autonomous car services;
- *Massive Machine-Type Communications machine type communications - mMTC* : supports a large number of connected devices , with very strict energy requirements (batteries with 15 years no need to charge). Associated with high access point coverage (around 15 km radius), such devices offer a relatively low traffic volume of non-delay sensitive data.

The minimum performance requirements for 5G have been defined by (ITU, 2017) and the values are provided in Table 1, along with the use case for which they are relevant. In practice, each service provided by an operator can define a set of minimum requirements, leaving it up to the 5G network to achieve them for the good provision of the service.

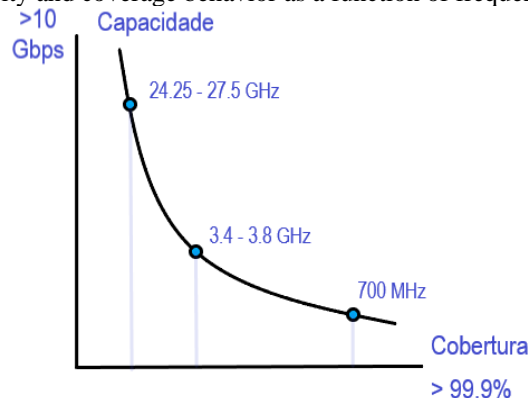
Table 1- Minimum requirements related to technical performance for IMT-2020.

Parâmetro	Caso de uso	Valores
Taxa de pico de dados	eMBB	DL: 20 Gbps, UL: 20 Gbps
Eficiência espectral de pico	eMBB	DL: 30 bps/Hz, UL: 15 bps/Hz
Taxa de dados de experiência do usuário	eMBB	DL: 100 Mbps, UL: 50 Mbps (Dense Urban)
Eficiência espectral média	eMBB	DL: 9 bps/Hz/TRxP, UL: 6.75 bps/Hz/TRxP (Indoor Hotspot); DL: 7.8 bps/Hz/TRxP, UL: 5.4 bps/Hz/TRxP (Dense Urban); DL: 3.3 bps/Hz/TRxP, UL: 1.6 bps/Hz/TRxP (Rural)
Capacidade de tráfego de área	eMBB	DL: 10 Mbps/m ² (Indoor Hotspot)
Latência do plano do usuário	eMBB, URLLC	eMBB: 4 ms, URLLC: 1 ms
Latência do plano de controle	eMBB, URLLC	eMBB/URLLC: 20 ms
Densidade de conexão	mMTC	1.000.000 dispositivos/km ²
Mobilidade	eMBB	Até 500 km/h
Tempo de interrupção de mobilidade	eMBB, URLLC	0 ms
Largura de banda	eMBB	Pelo menos, 100 MHz. Para operação em bandas de frequência mais altas (por exemplo, acima de 6 GHz), até 1 GHz.

Source: (Silva, 2020).

There are two sets of frequencies defined for 5G: the FR 1 (sub-7GHz) and the FR2 (*mmWave band* , between 24 and 52 GHz). The millimeter wave band (*mmWave*) is capable of carrying the large amount of data that is required by 5G as the bandwidth is 400 MHz. However, they cannot achieve extensive coverage, as they are easily blocked by obstructions, as illustrated in Figure 1.

Figure 1– Capacity and coverage behavior as a function of frequency band.



Source: (Silva, 2020).

In 5G networks, an array of antennas forms a massive MIMO system (Rusek et al., 2013) at the base station, called a gNB . Massive MIMO, combined with higher bandwidth, has the function of compensating for the propagation loss in the *mmWave range* , providing transmission rates in the Gbps level . However, the transmit power of gNB *mmWave* is smaller and is still divided between the elements of the MIMO array, as a consequence, the coverage radius of the gNB is smaller when compared to the 4G base station (eNB). Considering these aspects, the compromise between capacity and coverage needs to

be taken into account in the network planning stage (GE, 2016).

Motivated by the communication technologies mentioned above (*massive MIMO* and *mmWave*), microcell networks (*small cells*) have been incorporated into 5G cellular networks. To satisfy continuous coverage, the density of gNBs is expected to be around tens and even hundreds per km², and therefore, the 5G cellular network is considered an ultra-dense cellular network (UDN) (VASCONCELLOS, 2021).

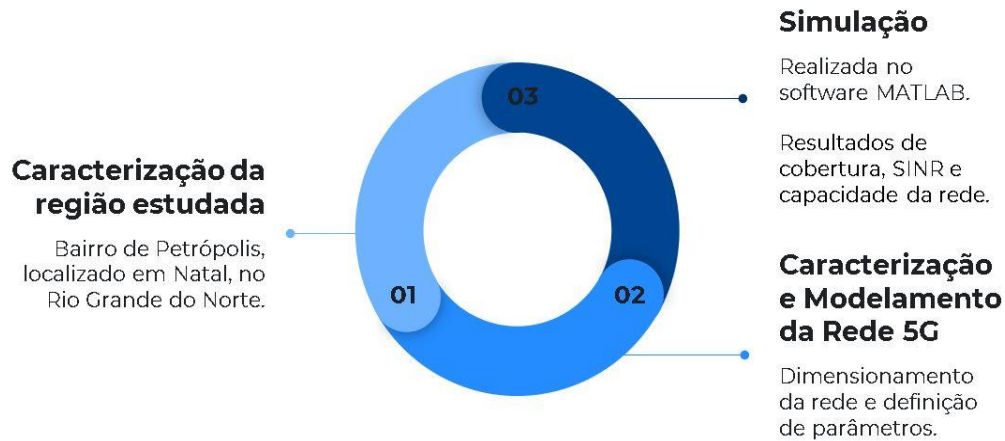
The challenges for the evolution and effective implementation of 5G technology in Brazil are diverse, ranging from regulatory and political issues to the need to expand and adapt the existing network infrastructure (SILVA, 2020). Focusing on the need to adapt the infrastructure in the radio access network, this work was based on the structure of the wireless access network in the city of Natal, Rio Grande do Norte. The main objective is to carry out a systemic analysis and discuss the possible challenges and performance results through simulation of the 5G deployment scenario in the Petrópolis neighborhood. It was considered a network formed by 4 macrocells , operating at 700 MHz and a second network, resulting from the expansion of the first, by the inclusion of 39 microcells operating at 3.5 GHz. The aim of the study is to compare the results obtained in terms of coverage, signal-to-interference-plus-noise ratio (SINR) and capacity of both networks.

The article is divided as follows. In Section II, the methodology for preparing the work, the theoretical framework and the modeling of the 5G system are presented. In Section III, the results obtained are presented and discussed. Finally, Section IV brings the main conclusions of the work and the expectation of future works.

2 METHOD AND THEORETICAL FRAMEWORK

The research methodology was a case study characterized by the simulation of the implementation of a 5G network in the neighborhood of Petrópolis, located in Natal/RN, aiming to discuss the possible challenges in the transition from the current network to the next generation of mobile technology on of the existing wireless access network infrastructure. The objective of the study is to observe the results of coverage, SINR and network capacity, comparing the current network structure (formed only by 4G macrocells) and the dense structure of the 5G network. The development of the study is divided into 3 phases, as illustrated in Figure 2.

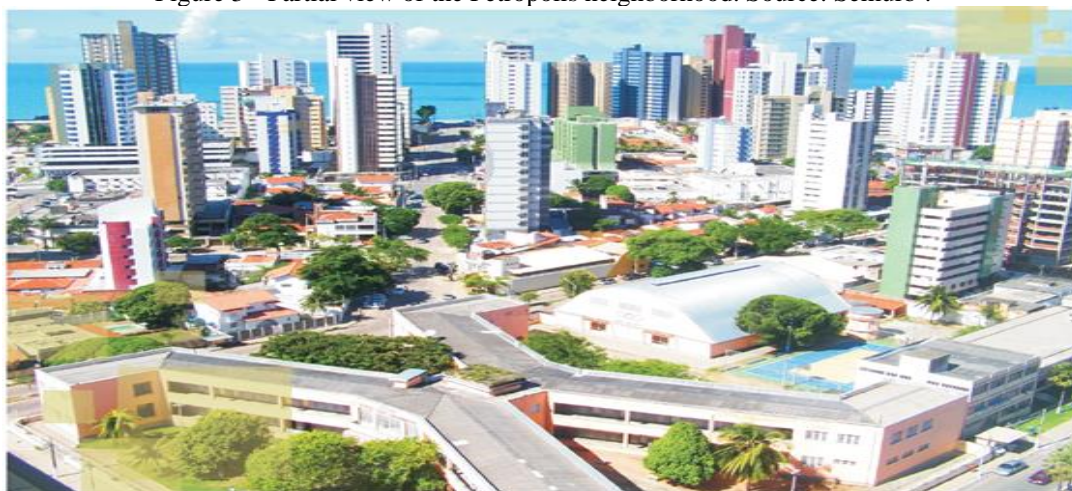
Figure 2– Main steps for the development of the work. Source: (Silva, 2020).



2.1 CHARACTERIZATION OF THE STUDY REGION

The Petrópolis region is a high-income neighborhood located in the East Zone of the city of Natal, constituting the densest region of the city, being the likely scenario for serving the first users of the 5G network in the city. According to the Natal City Hall (Semurb, 2017) based on estimates from the Brazilian Institute of Geography and Statistics (IBGE), the neighborhood in its area of 0.72 km^2 , houses a population of 5,846 inhabitants, in addition to the labor and floating contingent. The environment of loss of propagation, in much of the neighborhood, fits the situation described by (Bertoni, 2000), with areas of high real estate appreciation, good conditions regarding the provision of urban infrastructure and public services. Giving rise to significant loss in passing through obstacles, propagation occurs predominantly with many paths involving diffraction. The neighborhood is centrally located and has easy access to various regions of the city, as illustrated in Figure 3.

Figure 3 - Partial view of the Petrópolis neighborhood. Source: Semurb.



2.2 CHARACTERIZATION AND MODELING OF THE 5G NETWORK

The transition to 5G still presents technological, economic and even behavioral uncertainties, as the implementation strategies of MNOs (Mobile Network Operator) and consumer demand for 5G services

are not completely known. Therefore, the approach adopted consists of taking the characteristics of 4G as a basis (Ahmadi , 2014), and later, including the identified frequency bands that can be used for 5G deployment. Therefore, the strategy is to integrate the 700 and 3500 MHz spectrum to operate in *outdoor coverage* , since these are the new frequency bands available to MNOs in Brazil (VASCONCELLOS, 2021).

Second (Wisely et al, 2018), 3.5 GHz networks with 700 MHz overlapping coverage can offer 100 Mbps coverage and transmission rate combined with support for ultra-low latency services. In his study, in the district of London called Marylebone , which has a resident population density of 11500 inhab /km² and which reaches (approximately) 20000 inhab /km² in one working day (equivalent to 5000 users per operator), it was shown that 64 at 100 Mbps can be offered in a significant part of a dense urban environment using *mmWave* . The 3.5 GHz technology, with 100 MHz bandwidth, can provide *outdoor coverage* at 100 Mbps, as seen in Figure 4, as well as offering 66% coverage at 64 Mbps (and 100% coverage at 32 Mbps), as shown in Figure 5. The authors also found that 700 MHz bandwidth can provide nearly 100% coverage at lower data rates (typically 30 Mbps).

In the aforementioned study, the authors also showed that 700 MHz macrocells do not provide significant capacity (due to very limited bandwidth). As seen in Figure 6, densities of 32gNBs/km², the capacity is calculated at 0.83Gbps / km², and that 3.5GHz microcells can provide a capacity of 30Gbps /km² with a microcell density of 256gNBs / km², thus evidencing the efficiency of a mixed network. The planning of a mobile network aims to ensure certain levels of performance and quality, establishing a compromise between customer service and operators' costs. The performance and quality of service objectives involve parameters and metrics such as: proportion of covered area, degree of service, throughput , latency, among others.

Figure 4 - Outdoor coverage at a rate of 64 Mbps. Source: (Wisely et al., 2018) .

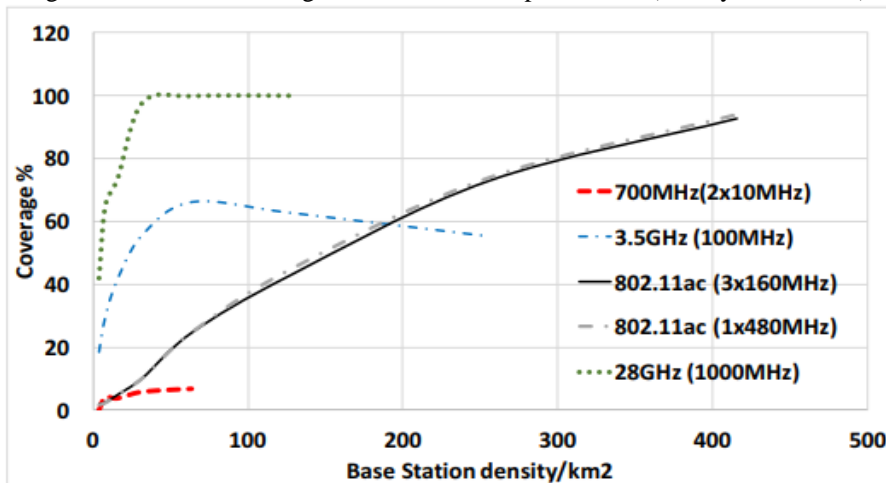


Figure 5 - Outdoor coverage at a rate of 100 Mbps. Source: (Wisely et al., 2018) .

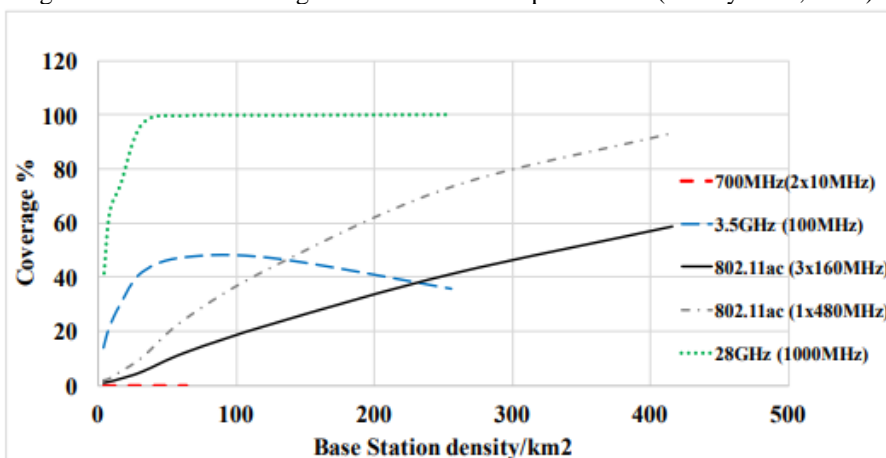
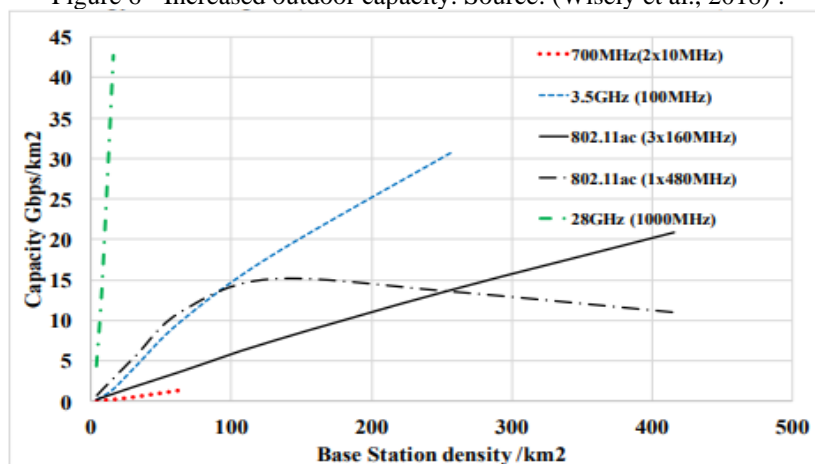


Figure 6 - Increased outdoor capacity. Source: (Wisely et al., 2018) .

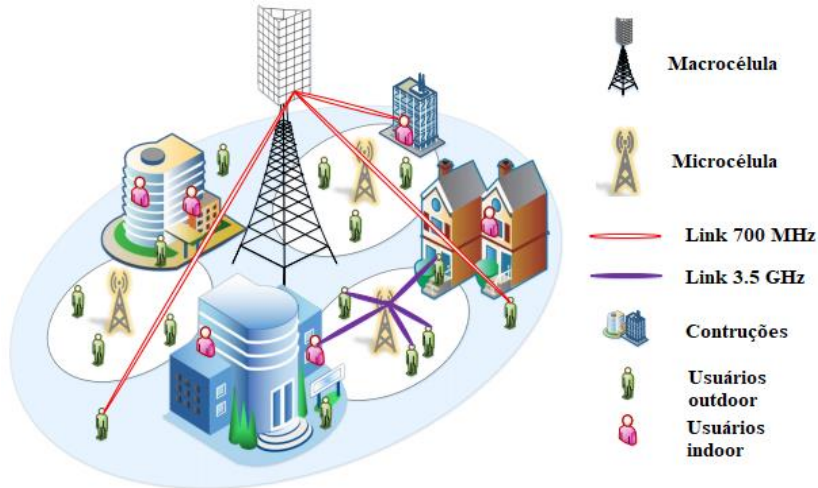


This process includes approximate models, signal strength estimates and traffic demands, which must be improved by analyzing the operational conditions of the field network (CÁVALCANTI, 2018).

There is low prospect of new urban macrocells , as they are increasingly expensive and will not provide capacity gains that *small cells* provide. The microcells will be implanted in electric poles and distributed with an ISD (*Inter-Site Distance*) corresponding to 200 meters (SUN et al., 2016) to cover the neighborhood, with the help of Google Earth to identify the points where there were poles and to respect

the defined distance between the cells. For the simulation in the neighborhood of Petrópolis, an *outdoor network* proposed in (Wisely et al., 2018) was considered, illustrated in Figure 7, in which 700 MHz macrocells provide coverage and signaling, while 3.5 GHz microcells perform the function to serve users with high data rate demand.

Figure 7 - Layout of the 5G network adopted in the study. Source: Adapted from Busari 's (2018) illustration .



It was necessary to choose one of the MNOs operating in the region to identify the 4G base stations currently operating in the neighborhood. After that, four current LTE sites were located in the region, as shown in Figure 8. Figure 9 indicates the insertions of the 39 microcells distributed to cover the entire neighborhood and Table 2 shows the locations in coordinates.

Figure 8 - Map of the Petrópolis neighborhood and indication of the location of the four BSs that cover the area.



Source: (Silva, 2020).

Figure 9 – Indication of the location of microcells distributed in Petrópolis.



Source: Source: Own authorship.

Table 2 - Coordinates of microcells distributed in Petrópolis.

MICROCÉLULA	LATITUDE	LONGITUDE	MICROCÉLULA	LATITUDE	LONGITUDE
1	-5,7890753	-35,1964526	21	-5,7837662	-35,2017586
2	-5,7884176	-35,1982635	22	-5,7864884	-35,1930674
3	-5,787822	-35,2000267	23	-5,7852339	-35,1950175
4	-5,7870202	-35,2020597	24	-5,7844543	-35,1966976
5	-5,7862433	-35,2036939	25	-5,7839197	-35,1982882
6	-5,7884072	-35,1951226	26	-5,7832073	-35,1997432
7	-5,7877442	-35,1970565	27	-5,7822528	-35,2022093
8	-5,7870569	-35,1984482	28	-5,7840199	-35,1946117
9	-5,7862869	-35,2005802	29	-5,7840182	-35,1955865
10	-5,7855404	-35,2022497	30	-5,7836716	-35,1970537
11	-5,7875944	-35,1940319	31	-5,7825827	-5,7825827
12	-5,7870131	-35,1958769	32	-5,7823596	-35,1980138
13	-5,7862133	-35,197217	33	-5,7815337	-35,1998496
14	-5,7856298	-35,1988979	34	-5,781726	-35,20114890
15	-5,7845736	-35,2011533	35	-5,780899	-35,2016513
16	-5,7855765	-35,2017316	36	-5,7825134	-35,1946253
17	-5,7865521	-35,1943701	37	-5,7808214	-35,1963618
18	-5,785575	-35,1963112	38	-5,7807309	-35,198535
19	-5,785086900	-35,1977037	39	-5,7795927	-35,2001547
20	-5,784321700	-35,1997961			

Source: (Silva, 2020).

The received power level and SINR measurements were based on the Longley -Rice propagation model (Prior and Cota , 2021) or irregular terrain model (*Irregular Terrain Model*), as it is also known, for 700 MHz. This model is based on data collected in the frequency range between 40 MHz and 100 GHz, and is used to calculate point-to-point path loss between locations on uneven terrain, including buildings. Path loss is calculated from the free space loss, terrain diffraction, ground reflection, refraction through the atmosphere, tropospheric dispersion, and atmospheric absorption (Hufford et al., 1982). For 3.5 GHz, the *Close-In* model (CI model) was considered (Sulyman et al., 2016, Cosenza, 2017), which is used for

frequencies in the order of GHz and implements a statistical path loss model. which can be configured for different scenarios.

As 5G predicts smaller cell sizes, station antennas tend to be closer to obstructions and therefore the CI model reference distance is suggested as 1 meter by default (SUN et al., 2016). In addition, a bandwidth of 20 MHz for 700 MHz and a bandwidth of 100 MHz for 3.5 GHz was determined. The antennas of both cell types were defined as sectorized and directive, with 8x8 and 4x4 MIMO arrays for macrocells and microcells , respectively. The other network parameters were defined as in (Busari , 2018) and are presented in Table 3.

Table 3 - Definition of the network parameters used for the simulation.

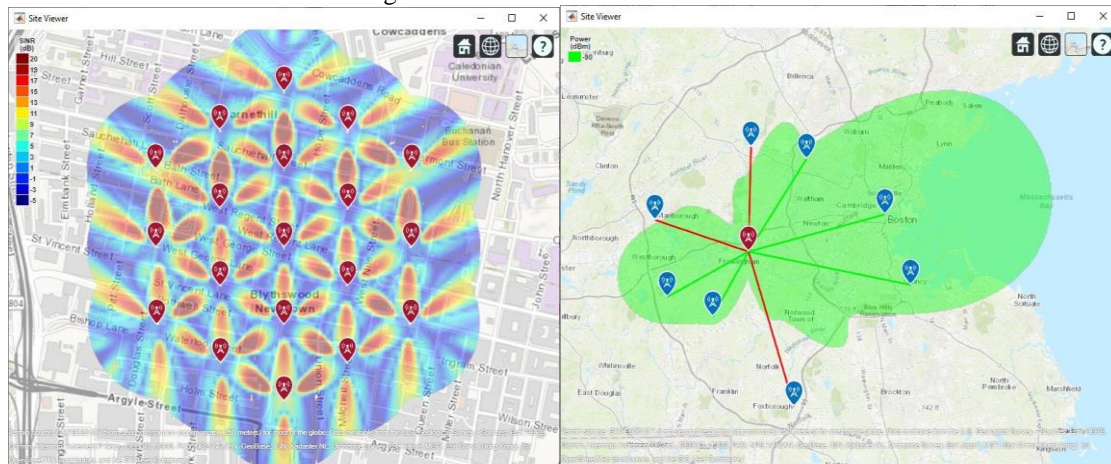
Macro célula	
Número de {células, setores}	{4, 12}
Padrão da antena	Tri-setorizada, diretiva
Altura da antena	25 m
Potência de transmissão	49 dBm
Frequência da portadora	700 MHz
Largura de banda	20 MHz
Modelo de propagação	Longley-Rice
Nº de elementos da antena MIMO	8x8
Micro célula	
Número de {células, setores}	{39, 117}
Padrão da antena	Tri-setorizada, diretiva
Altura da antena	10 m
Potência de transmissão	35 dBm
ISD (<i>Inter-site distance</i>)	200 m
Frequência da portadora	3.5 GHz
Largura de banda	100 MHz
Modelo de propagação	Close-in
Nº de elementos da antena MIMO	4x4
UE	
Altura do usuário	1.5 m
Ganho	0 dBi
Figura de ruído	9 dB
Nível de ruído térmico	-174 dBm/Hz

Source: (Silva, 2020).

2.3 SIMULATION

The simulation was performed in Matlab[®] software, which is a useful tool to assist in the modeling of telecommunications problems, as it integrates numerical analysis, matrix calculation, signal processing and graphics construction in a simplified environment. For the present study, Site Viewer was used, a Matlab resource that allows you to create transmitters and receivers, position them anywhere on the map and, thus, perform simulations involving propagation, presenting visual results, in a color map, with the illustrated in Figure 10.

Figure 10 – Site Viewer tool screens .

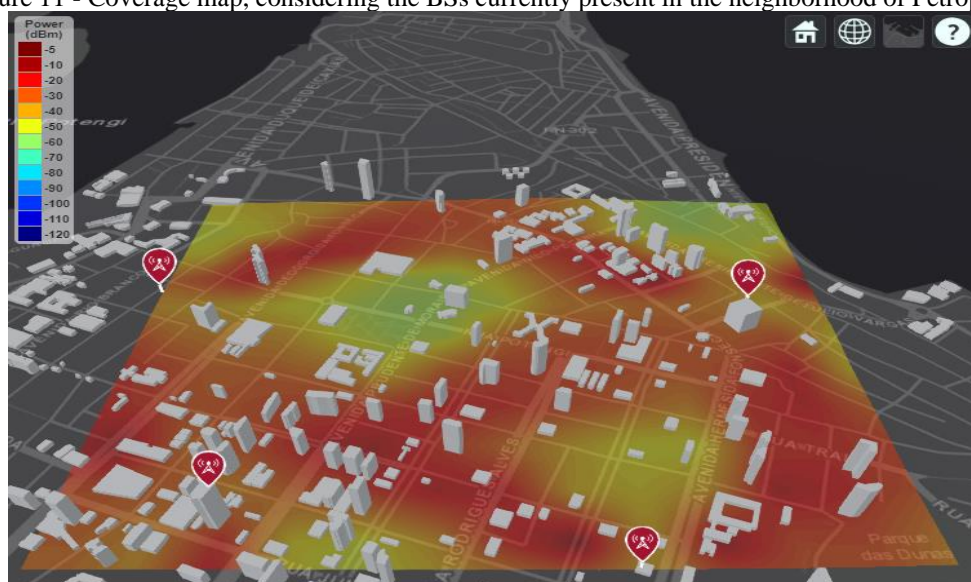


Source: Matlab official website .

3 RESULTS AND DISCUSSIONS

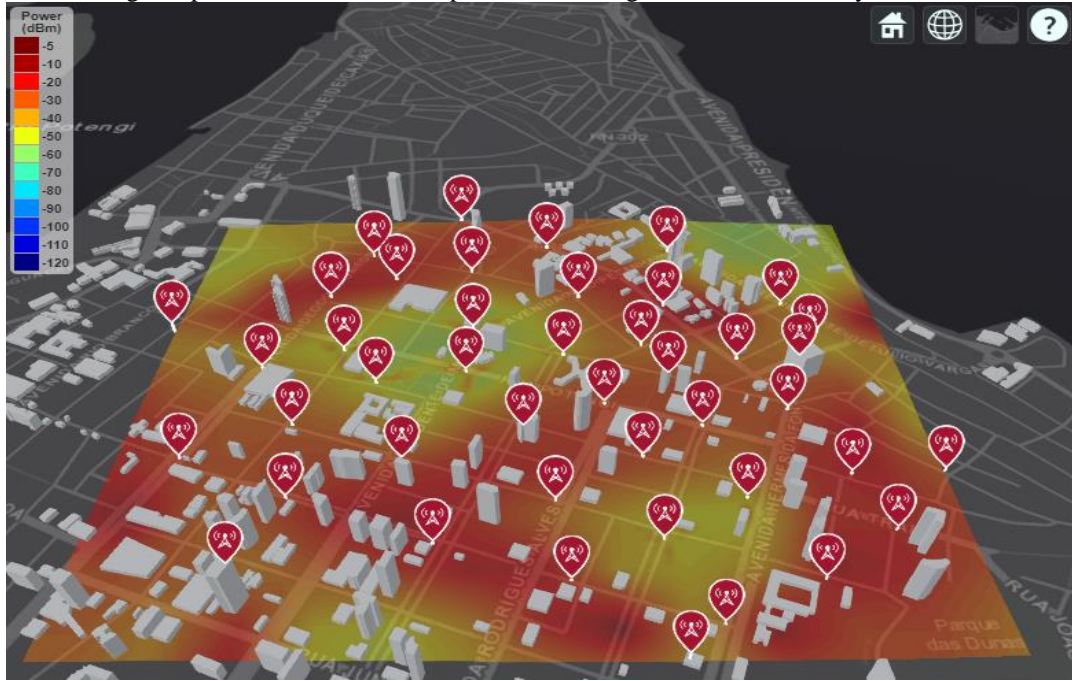
In this section, the results in terms of the *Radio Environment Maps* (REM) obtained in the simulations are presented and discussed. REM is a visual way to present quality results from a communication network through geo-referenced measures. In the results presented here, the antennas are identified on the map by the red markings. Projections of buildings present in the neighborhood were taken into account, obtained from OpenStreetMap , which are also represented on the map. Figure 11 and Figure 12 show the power received at each point for the current network of macrocells and for the proposed network, integrated by macrocells and microcells , respectively. The results show that in both scenarios, the received power in the entire region varies between -50 to -20 dBm , as shown in Figure 13

Figure 11 - Coverage map, considering the BSs currently present in the neighborhood of Petrópolis.



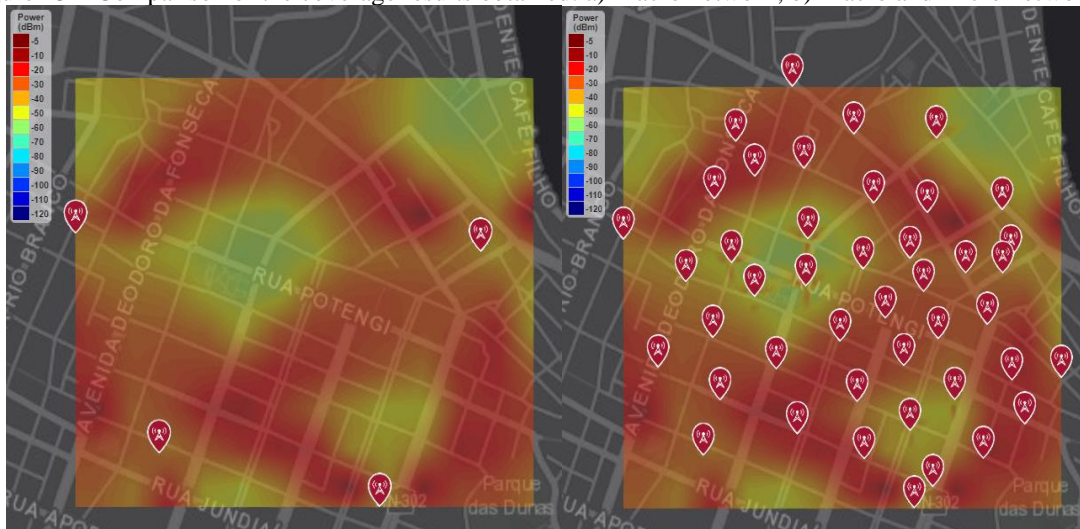
Source: Own authorship (elaborated in Matlab).

Figure 12 - Coverage map, in the district of Petrópolis, considering a network formed by macrocells and microcells.



Source: Own authorship (elaborated in Matlab).

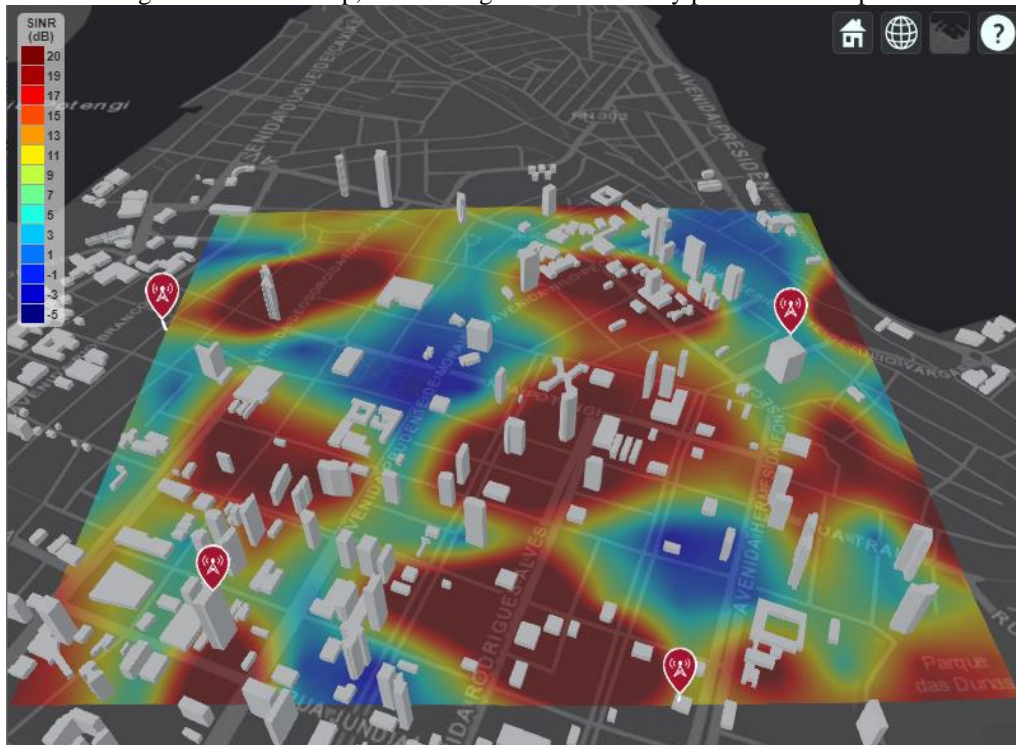
Figure 13 – Comparison of the coverage results obtained: a) Macro network; b) Macro and micro network.



Source: Own authorship (elaborated in Matlab).

The second phase of the simulation was dedicated to SINR measurement, again for the current network and for the network with macrocells and microcells , as shown in Figure 14 and Figure 15, respectively. The inclusion of microcells resulted in an improvement in SINR, especially in the areas close to the microcells , where before they had values below 0 dB, as shown in Figure 16.

Figure 14 - SINR map, considering the BSs currently present in Petrópolis.



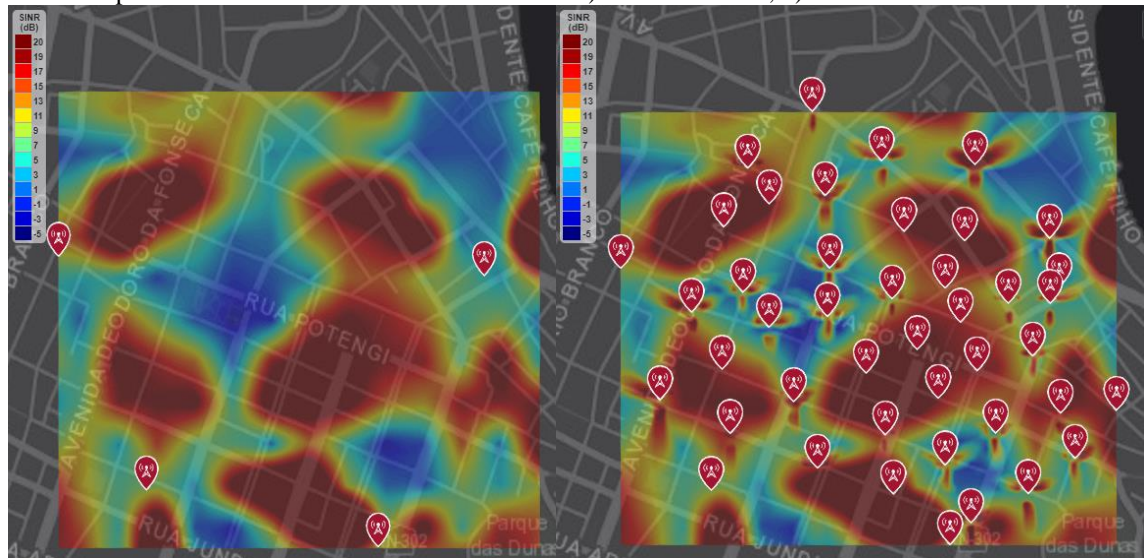
Source: Own authorship (elaborated in Matlab).

Figure 15 - SINR map in the district of Petrópolis, considering a network formed by macrocells and microcells.



Source: Own authorship (elaborated in Matlab).

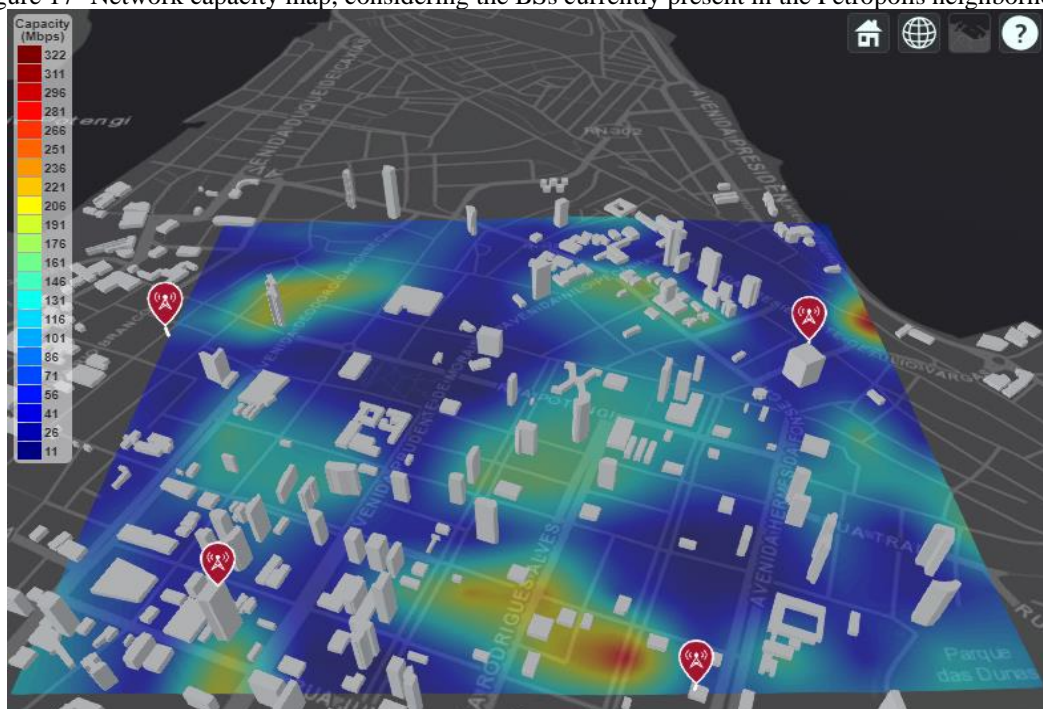
Figure 16 - Comparison of the results obtained from SINR: a) Macro network; b) Macro and micro network.



Source: Own authorship (elaborated in Matlab).

Finally, the network transmission capacity results were obtained, shown in Figures 17 and 18. The network transmission capacity ranged from 11 to 322 Mbps and, in most of the area, rates of up to 70 Mbps predominated. With the use of microcells , the network starts to reach transmission rates, predominantly around 100 to 200 Mbps, reaching a maximum capacity of 945 Mbps, as shown in Figure 19.

Figure 17- Network capacity map, considering the BSs currently present in the Petrópolis neighborhood.



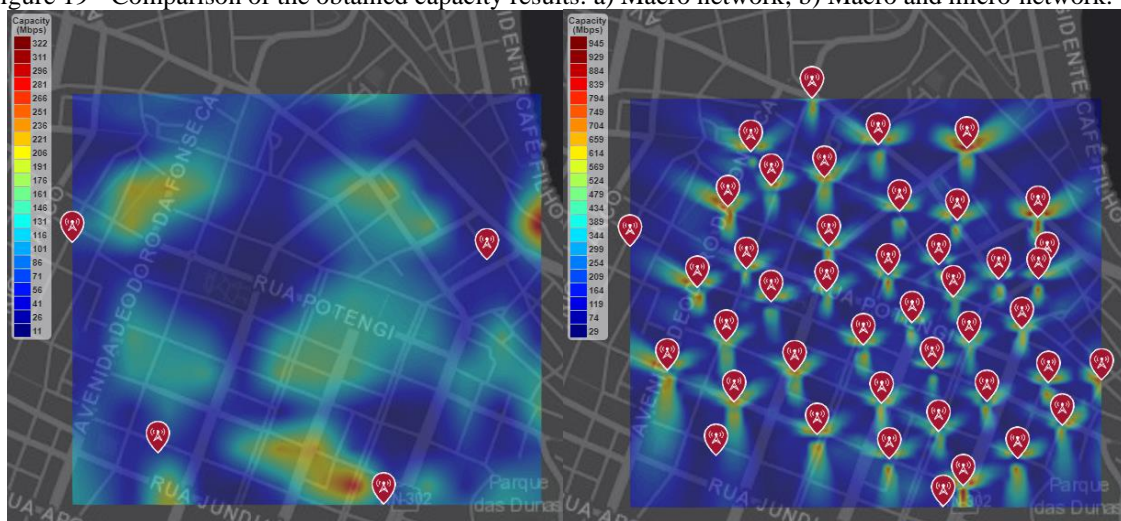
Source: Own authorship (elaborated in Matlab).

Figure 18 - Network capacity map in the district of Petrópolis, considering a network formed by macrocells and microcells.



Source: Own authorship (elaborated in Matlab).

Figure 19 - Comparison of the obtained capacity results: a) Macro network; b) Macro and micro network.



Source: Own authorship (elaborated in Matlab).

4 CONCLUSIONS

Currently, Brazilian mobile network operators are in the implementation phase of 5G, but the service is still limited in coverage area. Operators have adopted DSS (*Dynamic Spectrum Sharing*), providing the network with a physical layer with 5G transmission, using frequency bands of 3G and 4G systems. Without any significant change in the access network and in the core of the network, the use of DSS implies a lower transmission rate than expected for 5G (TRINDADE, 2020). As explained in (Oughton et al., 2018), spectrum sharing strategies may appear in most scenarios up to 2025 and, therefore, may play an important role in meeting short-term demand, although for future demands, this technique

becomes ineffective. This contrasts with the deployment of *small cells*, which provides expressive capacity upgrades. This work carried out a case study with the scenario of implementation of a 5G network in a dense urban area, comparing the results of coverage, SINR and capacity, evaluating the challenges of transition from the current network to the 5G network, ratifying the need to implement a dense network formed by macrocells and microcells. The choice of two frequency bands to expand the capacity of current 4G networks to 5G networks, 700 and 3500 MHz, is justified by taking advantage of the propagation characteristics that the 700 MHz band, with its great potential and expanding the current coverage area (SILVA, 2020).

While the 3.5 GHz band has more limited propagation characteristics, it provides greater bandwidth, allowing for additional capacity, especially if combined with microcell deployments. Analyzing the results of the simulation carried out, it is observed that the implantation of microcells in this frequency range does not present a significant performance improvement in terms of coverage, thus reinforcing the need for joint operation with macrocells in the 700 MHz band. This conclusion is supported by (Shafi et al., 2017), which also shows that high-density implementations of microcells can offload user plane traffic, but even so, macrocells need to act to provide coverage (in the range of microwave) to carry control plane traffic.

Increasing cell density can also result in increased co-channel interference, which will affect any capacity gains. This can be directly linked with the choice of ISD from the *small cells*. It should not be so small as to generate high interference and not so large that it exceeds the range of the cell (MIAO et al., 2016). However, in the simulation it was found that the variation in SINR levels does not seem to be so significant with the inclusion of microcells in an ISD equivalent to 200 meters. This is due to the fact that 5G antenna arrays have a much narrower beamwidth than existing sector antennas and therefore interference levels can be reduced. In addition, interference mitigation techniques such as those presented in (Shafi et al., 2017), which are in use in IMT-Advanced systems, can be employed, which combat interference from another cell and, therefore, contribute to improving the spectral efficiency.

According to the simulation results presented in this work, the transmission capacity of the network was favored with the implantation of microcells, reaching rates around 100 to 200 Mbps in most of the area, and reaching a maximum capacity of almost 1 Gbps. The analysis carried out on the Petrópolis neighborhood in Natal/RN investigated the high density of gNBs, characteristic of the 5G network. The suggested network, represented by 39 microcells operating at 3.5 GHz and 4 macrocells operating at 700 MHz, showed an increase in performance compatible with the 5G assumptions to serve the neighborhood of Petrópolis, in terms of coverage, SINR and, mainly, capacity transmission, which was characterized by reaching around 100 to 200 Mbps in almost the entire region of the neighborhood, reaching a capacity of almost 1 Gbps in specific regions. In view of the results, the importance of the simultaneous performance of the two bands was reinforced, in which the 700 MHz band provides network coverage and signaling and the 3.5 GHz band performs the function of access point to serve those users that demand high data rate.

As future works, the contribution of this study gives rise to its application to other neighborhoods

in the city of Natal/RN, with similar characteristics and its adaptation for application to other neighborhoods. In addition, it may be possible to expand the research by sizing the *backhaul network* in a way that makes it possible to perform network expansion cost forecasts.

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CHAPTER 64

Specialists in interest and collaboration networks, training and dissemination of knowledge in the field of assisted reproduction in Brazil

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ABSTRACT

This text is related to the way knowledge is disseminated in publications co-authored by specialists in assisted reproduction, it analyzes how connections between specialists in clinics and laboratories in Brazil are built. It is the result of research that aimed to identify and analyze collaborative networks in co-authorship between professionals in the area of reproduction linked to the Brazilian Society of Human Reproduction (SBRH). The data are from publications in the journal *Produção & Climatério*, from 2000 to 2016, and which are updated in other sources of multi-site research, found on the websites of assisted reproduction clinics affiliated to the Latin American Network of Assisted Reproduction. To this end, we chose to work with co-authorship networks that were organized into text files, with the help of software (UCInet and Pajek). This allowed us to visualize how the network is configured, which is made up of 1,064 specialists, who are concentrated in the Southeast region with relevance to the South and Midwest regions. It allowed to perceive the profile of sex and the dynamics that occur with the connections of different specialties in the field of assisted reproduction in the laboratory and what is its relevance for the production of knowledge, considering how it is disseminated and connected with other contexts from different sources, of our research.

Keywords: Co-authorship networks, Assisted Reproduction, Knowledge dissemination.

1 INTRODUÇÃO

Laboratory-assisted reproduction is currently involved with many aspects of intervention in the processes of reproduction of life and the construction of parenting and affiliations, as analyzed by Tarnovski (2017), Thèry and Leroyer (2014). Likewise, in the field, there is a great connection with technosciences, aspects analyzed by Puig de la Bellacasa (2011). These clinical practices concerned with fertility and infertility open different windows to their analysis, they connect both with aspects that bring inequality of access to the solution of reproductive problems (TAIN, 2013) and the dependence on networks of uteruses from other countries. women, as shown by Puleo (2017) and Hochschid (2012). There are still important tensions for the field, from authors who denounce assisted reproduction, inserting their practices as a baby

market, called the baby business as denounces . Spar (2007). But it is also a fact that in recent years the intense circulation of gametes: eggs and sperm opened other discussions (BORGSTRØM; NYGAARD,; DANIELSEN, ET AL. (2019).

These donations and receptions are part of a global bioeconomic market as discussed by Waldby and Cooper (2014), involve connections between secret arrangements and the market (RIVAS, LORES, JOCILES, 2019, and have facilitated homosexual couples to look for their children by articulating in reproductive networks to obtain national and international eggs and uterus, the so-called “ *cross-borderreproductivecare* ” (OLAVARRÍA, 2018; VITULE, MACHIN, 2015). Different people have been able to count on semen banks for some time (MAMO, 2005) and with more recent international reproductive support networks (MAMO, 2018). Outside the clinical context, home reproduction also marks assisted human reproduction with specific dynamics (FELIPE, TAMANINI, 2021; 2020).

For this chapter we must say that our theme is in this context of the breadth of the subject, however we cut it by choosing the co-authorship networks. Our collaborative networks are a point in an ocean, which allow us to deepen the study of scientific communities and their profiles in laboratory-assisted reproduction in Brazil. In this text we analyze the process of collaboration between specialists, based on the bibliographic production in co-authorship. Our communities are clinical and scientific, therefore, they are linked to treatments and interventions in assisted reproduction, an aspect that also requires from those who look at them openness to interpretation and, therefore, connections with different data and other sources of research that we have already developed.

These networks are part of treatments that focus on the construction of fertility and fecundity, therefore, they are interrelated with protocols of clinical and technological interventions that may have different purposes.

The processes of intervention, decision-making on the bodies of couples, especially women, and, at the same time, on gametes and embryos occupy a place of deep interface with technology, drugs, diagnostics, research and the media, in a situation market and/or women and couples looking for children.

The objective of this research was to identify the collaboration networks formed by professionals specialized in human reproduction, linked to the Brazilian Society of Human Reproduction (SBRH), from articles published in the magazine “Reprodução & Climatério in the period from 2000 to 2016. In addition, the aim is to understand what the configurations of these networks mean in this field and what they demonstrate about the dynamics of knowledge and the insertion of professionals in co-authorship networks as a configuration of the field of assisted reproduction in Brazil in a period of great changes. also technological in the area.

2 METHODOLOGIES

Data collection was carried out from September to December 2016, on the website of the Brazilian Society of Human Reproduction (SBRH), specifically in the “Reprodução & Climatério” Magazine. In this

source, four issues were published annually in 2000 and 2001. In 2002 there was no publication of the journal. From 2003 to 2006, one issue was published per year. Between 2007 and 2010, four editions were published each year. And between 2011 and 2016, three editions were published per year. ¹The choice of this period was intentional, because in this period and, in 2018, we collected from other different sources, data related to the specialists and their connections: their articles, testimonials, images and the constitution of the team on the clinics' websites.

This text, therefore, is also part of different networks from which we look at the field of assisted reproduction. Specifically, in this chapter we work with material from the “Reprodução & Climatério” Magazine, but the interpretation benefits from the body of knowledge that we were producing from the sources of articles found on the websites of Brazilian and Latin American clinics affiliated to the Latin American Reproduction Network. Assisted (REDLARA).

The analysis presented here prioritizes information collected in the Revista “Reprodução & Climatério” and which were sequentially organized into text files; with the help of *software* (UCInet and Pajek), with the aim of building co-authorship networks, which allows us to understand how specialists move and how knowledge circulates.

From this organization it was possible to calculate the indices and parameters of the networks with specific softwares of network theory. We use network theory as a quantitative method to identify and characterize collaborative networks of researchers in bibliographic production.

The magazine “Reprodução & Climatério” was and is an important instrument for the dissemination of knowledge produced by the network of specialists who are part of the Brazilian Society of Human Reproduction (SBRH) for a certain period of time. This temporality is compatible with the great expansion of practices in assisted reproduction and also with great changes in terms of the accumulation of knowledge, access to new technologies and other intervention protocols that also involve gametes and embryos. It published topics from different areas involved with human reproduction in the laboratory, or in gynecology and obstetrics clinics. These are publications related to assisted reproduction, reproductive health, infertility, endometriosis, menopause, sexual and gender violence, adolescence, contraception, fetal medicine, endocrinology and gynecology. It is a relevant source as a marker of a field of interventions because gynecology and obstetrics continue to be fundamental specialties, although never the only ones, among those that we mapped in different temporalities on the websites of clinics affiliated to the Latin American Network of Assisted Reproduction (REDLARA).

As can be seen in the articles in question, this journal has published many topics with interfaces and/or specific interests in assisted reproduction. This fact allows us to compare its contents with other publications collected from the websites of assisted reproduction clinics, affiliated to the Latin American

¹In 2017 this journal was discontinued, but all editions remain available for evaluation and consultation. Available at: <www.sbrh.org.br .>. Accessed on: 07 Jul. 2022

Network of Assisted Reproduction, and to establish some nexuses that coincide or not, among those we have demarcated for the last 20 years in this field. (TAMANINI, 2022).

It also allows us to perceive how links of meanings and/or indicative of interests and values are established regarding how these collectives, in the Latourian sense, interact and connect contemporaneously with the dynamics of the field of human reproduction, whose practices with technologies, protocols and research have already are widespread and are desired by people seeking membership (TAMANINI, 2021).

Doing this is relevant because intervention in human reproduction today, and has been for a long time, is not a private issue, it has changed a lot since the 80's, when the first babies were born from procedures in clinics. It is necessary to understand how it becomes an increasingly field of intervention by laboratories, clinics and specialists, genetic research, embryos and cells, as well as oncofertility, a field, therefore, of many hybrid *actants* that make up a sociotechnical network, composed of human and non-human actors (LATOUR, 2000). It is, therefore, limited to many interests and is far from concerns about sexual and reproductive rights, in the sense of the years that the different international women's conferences did; it is not even limited to infertility and the infertile couple category as it was in the past (TAMANINI, 2003).

This dissemination, as Latour (2000, 1997) would say, makes technologies and interventions and does so from their relationship between areas of knowledge, therefore, keeps an interdisciplinary character and produces the circulation of knowledge, according to Foucauldian perspective (2008), (1995). These knowledges are connected with desires, hormones, ovaries, testes, uterus, pituitary glands, embryos, semen, endometrium, legislation, stress, suffering, depression and pre-implantation diagnoses and beliefs (LATOUR, 2002). They are currently connected and produced in national and international networks to search for gametes and uteruses (TOBER, PAVONE, 2018).

These interventions and these researches have produced conditions for the use of conception technologies, with the purpose of infertility treatment, and for the preservation of fertility for a longer time, above all, they aim to guarantee its guarantee in cases of chemotherapy and radiotherapy treatments, with vitrification of gametes, or from ovarian and/or testicular tissues.

3 DEVELOPMENT

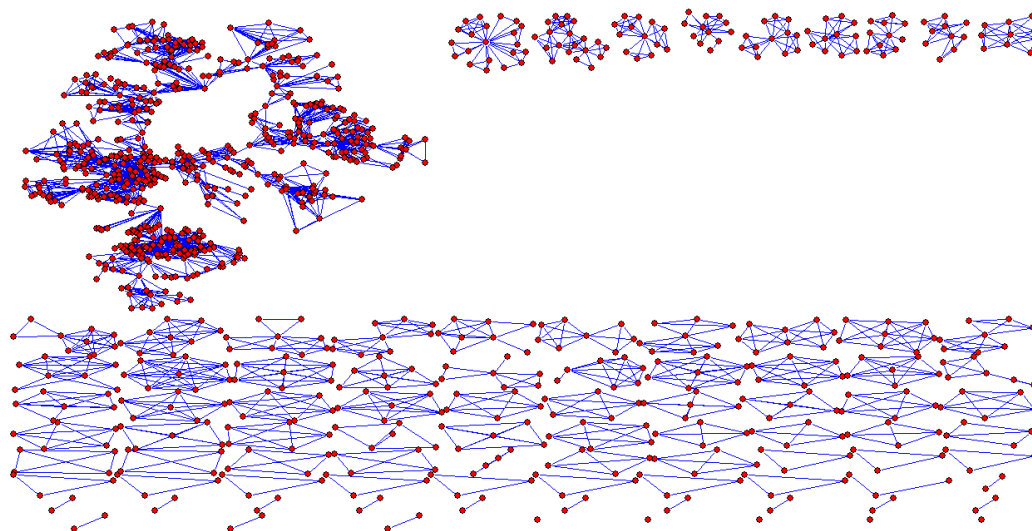
According to Andrade and Tamanini (2016), when we think of co-authorship networks, it is necessary to consider that these co-authors have different backgrounds and different conditions of possibilities for the exercise of intervention in reproductive practices; have different degrees of participation in the connections they establish with each other within their own field and outside it, and this can have significant relationships for the people who seek them, who are also marked by access to treatment and by the regionalized place where the clinic is located.

Part of these networks is made up of specialists who have graduated or are undergoing training within the clinics themselves. Not all are in the great centers; several circulate locally in geographic terms and connect internationally, others circulate nationally and internationally and undergo constant training in international centers. Some circulate less in networks, but have great local and/or regional expression; there are few who are isolated authors, however, all isolated or not, may be involved with human reproduction, with their gynecology and obstetrics clinic and, or others, more specifically with assisted reproduction. They form, therefore, collectives that constitute themselves as co-participants and interested in human reproduction.

Therefore, this network that is presented is marked by all these factors and, regardless of its descriptive aspect; it is associated with the issues of exposing characteristics of a certain population (clinical professionals and researchers) establishing relationships between networks of scientific collaboration and knowledge dissemination.

The total network of the bibliographic production of the journal “Reprodução & Climatério”, which was published by SBRH, is shown in Figure 1. The vertices correspond to the specialists and the edges to the articles written in co-authorship between them.

Figure 1: Graph of the Bibliographic Production network of the magazine “Reprodução & Climatério” from 2000 to 2016.



Author: MELO, DSC *Scientific Initiation Report* , Salvador, BA, Instituto Federal da Bahia, 2017.

The network has 1064 vertices (experts) which are the components of the network, the lines are the edges and indicate that the researchers wrote articles together, they represent the connections between the vertices. This network is also composed of 88 components (groups), with the largest component (group) having 594 vertices/experts. This is a large component with 56% of the vertices in Figure 1, from which it can be seen that there is an intense dynamic between them, with the circulation of information and knowledge about research and practices in the large area of reproduction. human.

In the manual collection of the names in the published texts, it is possible to observe the regions of origin and the sex of 952 of these specialists. From the analyzes it is seen that 55.77% are from the Southeast region with 531 specialists identified, the South region with 165 specialists, represents 17.33%, the Midwest with 122 specialists, represents 12.81%, Northeast with 58 specialists, represents 6.09% and the North, with 26 specialists, represents 2.73%. There is also an important international network that connects 5.14% of these specialists, as shown in the table below. About the 112 missing to complete the 1064 vertices, it was not possible to know neither sex nor region.

Table 1

Region	Regions				
	Sex	%	Total*	%	
North	F	18	1.89%	26	2.73%
	M	8	0.84%		
North East	F	26	2.73%	58	6.09%
	M	32	3.31%		
Midwest	F	62	6.51%	122	12.81%
	M	60	6.30%		
South	F	102	10.71%	165	17.33%
	M	63	6.61%		
Southeast	F	259	27.20%	531	55.77%
	M	272	28.57%		
abroad	F	20	2.10%	49	5.14%
	M	29	3.04%		
Unknown Region	F	0	0	1	0.10%
	M	1	0.10%		
Total**		952	100%	952	100%

Source: Revista Produção & Climatério da SBRH, authored by Mariana Gonçalves Felipe, at the time in 2018, student of social sciences at UFPR and scientific initiation scholarship.

This network of co-authorships in the journal “Reprodução & Climatério”, denotes a large concentration of specialists in the Southeast region, a configuration that also appeared from the use of data from the REDLARA website, which is followed by the South and Center West regions (ANDRADE, TAMANINI, 2016) and which has practical meanings regarding the regionalization of the countryside, accesses and clinics that play a fundamental role in the provision of human reproduction services.

According to Newman (2010), when the largest component of the network has more than 50% of the vertices it represents the system, in this case it is the largest structuring for the field of human reproduction, as it is for assisted reproduction in terms of co-authorship that is clearly concentrated in the Southeast region.

These groups present direct links between two actors (dyads) and direct or indirect links between three actors (triads) with cases of several vertices connected directly or indirectly through a transmitting center (vertex) where a centralized node receives connections from the other actors. This central position can serve as an intensifier and encourager of distant actors, but it can also interrupt the information between

the extreme points of the network, if the researcher, for some reason, leaves the network. In assisted reproduction, it represents a great connective capacity with publications, but also with the provision of services and access to treatments for individuals and couples.

In this network, most vertices are connected to other vertices through a small number of edges, that is, the path taken for the transfer of information from any individual to the recipient is minimal. It is a network that features highly grouped actors that are at the same time connected to actors outside their groups through a small number of intermediate vertices. This type of configuration according to network theory is less susceptible to fragmentation, allowing greater stability of the network structure, it also demonstrates the stability of the group. It is a type of network that provides elements for the durability of the relationship structures between its components, which is visible in the field of assisted reproduction, whose production and structuring also depend on the ability of clinics to offer services, to update themselves and to create infrastructure. compatible with the requirements of different diagnoses and to respond to people's searches.

Analyzed by measures of centrality, the specialists with the highest centrality are considered relevant in terms of publication. Three measures of centrality commonly applied in Social Network Analysis (SNA) studies were used: degree centrality, proximity centrality and betweenness centrality.²

In this way, degree centrality is the measure of the direct influence that a vertex (expert) has in relation to its neighbors; proximity centrality is related to the duration that certain information takes to be propagated by all vertices in the network; and the betweenness centrality of a vertex is related to the possibilities that this vertex is on the shortest path between several other pairs of vertices.

Degree centrality is defined by the number of adjacent ties that a vertex has with others in a network. Degree centrality focuses on the importance of an actor in the simple connections it establishes with neighboring actors, and is quantified by the degree of the vertex. Thus, one vertex in the network is more important than another if it establishes a greater number of links with neighboring vertices.

Proximity centrality is a function of the greater or lesser distance of a vertex in relation to all others in a network. The idea is that a central vertex is the one that has the best conditions to interact quickly with all the others (SCOTT, 2002; FREEMAN, 1979; HANNEMAN; RIDDLE, 2005). An actor's proximity centrality is based on proximity or distance. While degree centrality is measured for actors adjacent to a given actor, proximity centrality shows how close an actor is to all others in the network. Betweenness centrality assesses the dependence of non-adjacent vertices on others that act as a kind of bridge for effective interaction between them (FREEMAN, 1979).

²The degree represents the number of vertex connections. The degree being the number of connections of each vertex, the average degree is the average of connections performed by a vertex.

In this case, the greater the degree of centrality, the greater the potential control of a vertex over others that depend on it to execute the interaction. The intermediate vertex is the one that makes the connection between other vertices that do not have direct relations with each other ³.

In Table 1 we present the first 10 highest values obtained for the centralities of degree (CG), proximity (CP) and intermediation (CI) of the researchers who published articles in the journal “Reprodução & Climatério” edited by SBRH, from 2000 to 2000. 2016 . The names of the experts were replaced by codes where the letter P corresponds to researcher and the number corresponds to the order in which the centrality results were obtained using specific software from network theory.

Table 1 - Degree Centrality (Cg), Proximity (Cp) and Intermediation Ci).

Specialist	Sex	CG	Especialista	Sexo	Cp	Especialista	Sexo	Ci
P1048	M	90.0	P928	M	0.224	P928	M	73.658
P928	M	68.0	P702	M	0.224	P124	F	57.798
P460	M	40.0	P377	M	0.224	P285	M	57.557
P831	F	38.0	P919	F	0.224	P266	M	55.283
P78	F	31.0	P831	F	0.224	P919	F	52.012
P278	M	31.0	P78	F	0.224	P1048	M	47.769
P519	M	30.0	P519	M	0.224	P1004	F	45.325
P702	M	29.0	P922	F	0.224	P112	F	40.152
P611	F	27.0	P596	F	0.224	P333	M	39.672
P112	F	26.0	P198	F	0.224	P206	M	39.604

Author: MELO, DSC Scientific Initiation Report, Salvador, BA, Instituto Federal da Bahia, 2017.

The specialists shown in table 1 are from the following Brazilian regions: in the degree centrality there is 1 specialist from the Midwest region, 8 from the Southeast region and 1 from the Northeast. In the proximity centrality there are 9 specialists from the Southeast region and 1 specialist from the Northeast region. For intermediation centrality, there are 6 specialists from the Southeast region, 1 from the Midwest region and 1 from the Northeast. The dynamics related to proximity and intermediation continue to be greater than those found in the Southeast region. However, as can be seen in table 1, the vertex P 928, which is in the southeast, has the second highest degree centrality and the highest proximity and intermediation centralities. He is male and marks a great performance on the network, both in publications and in training for new specialists in the field.

³To deepen the studies on network properties, we recommend reading the following authors: Newman (2003), Watts (1999) and Barabási (2016). The word collaboration comes from the Latin *collaborare* and is defined as “cooperation, help, assistance, participation in someone else's work [...] an idea that contributes to the realization of something”. (HOUAISS, 2001). For Katz and Martin (1997), two scientists collaborate when they share data, equipment and/or ideas in a project, which usually results in experiments and analysis of research published in an article, that is, scientific collaboration is joint work. of researchers to achieve a common goal of producing new scientific knowledge.

Thus, this expert P928 in this network is an important vertex because it establishes the largest number of links with neighboring vertices and is also the vertex that acts as a bridge, making direct and indirect connections between the other actors; which also denotes its ability to mediate relationships between other actors that are not directly linked to it. Vertices with high betweenness centrality control the flow of information, establishing a relationship of dependence with the other actors in the network, as they serve as bridges through their connection between different groups in the network.

On the other hand, if these vertices are removed, this can affect the network, interrupting the flow of information between the actors, which can cause an important isolation for the field of assisted reproduction, in case other disseminators do not appear.

Vertex P1048 is a relevant vertex, as it has the highest degree centrality, with a large number of connections and published articles. This specialist is from the Midwest region. It's male. It is assumed that it exerts a direct influence on its neighbors, as it establishes a greater number of links with neighboring vertices.

The two researchers (vertices P928 and P1048) have already stood out in the first places of centrality in research with material from clinics affiliated to REDLARA (ANDRADE, TAMANINI, 2016), which gives us peace of mind to show how these dynamics in assisted reproduction are concentrated in certain regions of Brazil.

From the point of view of the sex profile and what this configures for gender equality in publications and knowledge, it is important to note that among the 10 specialists with the greatest prominence for the regions, there are four women in the centrality of the degree. Five in proximity centrality and four in betweenness centrality. In addition to these centralities, in terms of the sex of the 1064 specialists in this network, it is observed that 493 vertices are women, 430 are men; over 140 it was not possible to identify the sex. This data allows us to affirm that the publications in this journal *Produção & Climatério*, which are known to express concerns, research and activities in gynecology and obstetrics, as a fundamental area of human reproduction, are becoming feminized. This data coincides with the same process observed for assisted reproduction clinics in Brazil in the REDLARA sources, collected in 2017, which is not repeated for all Latin American countries, as we have seen, but which marks an important change in the field with the entry of women into clinics, both as specialists and as clinic owners and administrators, an aspect also observed for Barcelona, in another survey carried out in 2010.

The entry of the areas of embryology, human reproduction and biological sciences has modified the sex profile of the area of assisted reproduction. This area is also becoming feminized in its structure of clinics and laboratories, even if the rigid sexual division of labor seems to be maintained in several Latin American countries and, above all, if it reproduces inequalities in terms of recognition for biologists and techniques of laboratory, for example. In the area of gynecology and obstetrics, in table 2 of the sequence, there are 480 vertices that represent 52.11% of the total of specialists in relation to the set of other areas of knowledge publishing in this medium. It is still predominant, as the number of specialists, marked with

more men 233, they represent 48.54% compared to 208, which represent 43.33% of women. However, the difference is small and it can be observed in different sources that this trend towards the growth of women in the countryside is confirmed.

In the classification of specialties, always based on the self-denomination of the specialists, table 2 shows those that appeared in the co-authored publications. Thus, the medicine category, which can involve many built-in specialties, has 268 specialists and represents 29.9% of the training of specialists who publish in this journal. This category in terms of sex profile is quite feminized and is represented with 53.73% women and 46.26% men.

Among the 172 specialists of the “ Reproduction & Climacteric ” magazine, representing 18.67% of those who identified themselves as specialists in human reproduction, we have 41.86% women and 58.72% men. As in general, these specialists are also gynecologists and/or obstetricians, this data shows why the difference for more in relation to men prevails, due to the fact that gynecology and obstetrics is still a very masculine area. The 9.22% of biological sciences, 85 specialists, coincide with important cleavages that also appear for the formation of teams and for publications extracted from the websites of assisted reproduction clinics affiliated to REDELARA. They demonstrate the growth of the area in the field. Women are 70.58% of the 85 specialists in biological sciences, who are publishing in this source. This data denotes what we have said before, for other areas, a process of feminization in the biological field.

The area of genetics and embryology has 45 specialists and represents 4.88% of all areas in Table 2, there is also an important cleavage by sex here, 31 people are women, representing 68.88% and 14 are men, representing 31.11%.

The same happens with the specialists who are psychologists in number of 32 representing 3.47% for the group of professionals, being 28 women, 81.05% therefore for this denomination, 4 are men representing 12.50%. Urology and Andrology, as we have already seen in previous research, are mostly male, in this publication of the Reproduction & Climacterium journal there are 37 specialists, of which 10 representing 27.02% are women. Men are 27 and represent 72.97% in the area.

Table 2

Main Specialties				
Specialty	Sex	%	Total*	%
Gynecology and Obstetrics	208	43.33%	480	52.11%
	233	48.54%		
Medicine	144	53.73%	268	29.09%
	124	46.26%		
Human Reproduction	72	41.86%	172	18.67%
	101	58.72%		
Genetics and Embryology	31	68.88%	45	4.88%
	14	31.11%		
biological Sciences	60	70.58%	85	9.22%
	52	61.17%		
Psychology	28	81.05%	32	3.47%
	4	12.50%		

Urology/Andrology	10	27.02%		
	27	72.97%	37	4.01%
Total			921	
*Total of men and women in the specialty, without the sum of the variable "unknown"				

Source: Revista Produção & Climatério da SBRH, authored by Mariana Gonçalves Felipe, at the time in 2018, student of social sciences at UFPR and scientific initiation scholarship.

3.1 TOPICS OF INTEREST AND DISSEMINATION OF KNOWLEDGE - TABLE 3

1064 researchers appear in co-authorship networks with collaboration in 447 articles. The articles were grouped by themes, 200 titles among those published in Reproduction & Climacterium, correspond to themes of gynecology and obstetrics in general.

The remaining 247 are in the field of assisted reproduction, with a strong interest in assisted reproduction techniques (15.43%), and in research with cells and hormones, coinciding with the interests of hybrid collectives, also perceived in the publications of affiliated clinics. the REDLARA.

The themes of female infertility (14.09%), ovary (8.72%), diagnosis of infertility for both men and women (8.27%), which added to the themes focusing solely on female infertility (14.09%) and male infertility (5.59%)⁴, plus endometriosis representing (4.92%) connect great centrality in the interest in infertility. Texts discussing issues related to hormones also have great co-production, forming a relevant collective in this source that represents (6.04%) of the interests in the articles. Semen that has been material of interest in other sources is also very relevant in this one, with (5.36%) among the published themes. Research (5.59%) and dissemination of its results are again confirmed as being of great interest to specialists involved with assisted reproduction.

The interest in embryos is of high relevance today in publications coming from assisted reproduction websites⁵. This is also the case in this journal and it clearly shows, together with others such as ovum and semen, that the gaze of these specialists is much more dedicated to cells and their interactions, genetic technologies and their possibilities for reproductive improvement than it was in the past. Egg is a relevant category because it connects and collects processes and because it becomes manipulable material, gaining a fundamental status in laboratory procedures and in expert-managed donor networks. In the materials collected from REDLARA sources, it appears as fundamental in the techniques and studies, in which their maturation processes, the donation/reception networks, banks and their maintenance, the ways to obtain them through stimulation and discussions about the conditions to obtain them. Aspect that involves technologies, hormones, exams and tests, age of the woman, the donor and the recipient. As well as

⁴Male infertility has in its composition issues referring to different causes of this problem such as varicocele, emotional and endocrine issues, for example. It refers to the need for professionals in the fields of andrology and urology in this field to answer the numerous questions that infertility still presents. The male infertility category is always associated with the male individual as a whole. Contrary to what is observed when it comes to Female Infertility, a category that appears to be fragmented.

⁵It concerns contents such as differences between fresh and vitrified embryos, studies on the re-vitrification of embryos, different embryonic maturities and different implantation moments, vitrification of embryos with the *slow-freezing technique*, among others.

normative and legal issues, referring to the networks of humans involved in obtaining gametes (MACHIN, 2016).

Table 3

THEMATIC	No	%
interdisciplinary	3	0.67%
drugs	4	0.89%
DGPI	4	0.89%
Obesity	4	0.89%
Psychological Factors	9	2.01%
Uterus	6	1.34%
Scratches	10	2.23%
oncofertility	13	2.90%
Environmental Factors	12	2.68%
egg	13	2.90%
Embryo	18	4.02%
Infertility	20	4.47%
endometriosis	22	4.92%
male infertility	25	5.59%
Semen	24	5.36%
Search	25	5.59%
hormones	27	6.04%
Infertility diagnoses for both	37	8.27%
Ovary	39	8.72%
female infertility	63	14.09%
technique	69	15.43%
Total	447	

Source: Revista Produção & Climatério da SBRH, authored by Mariana Gonçalves Felipe, at the time in 2018, student of social sciences at UFPR and scientific initiation scholarship.

Today, in the field of assisted human reproduction, specialists and solution seekers for the absence of children are constantly linked to different networks, with elements (material and immaterial), whose relationships are forged by the activation of knowledge, technologies and desires and are produced in the construction of an architecture of normality for bodies considered infertile and/or barren; which must, however, reproduce as fertile.

To the extent that all processes that seek clinics are expressed in making decisions, executing protocols and making interventions through specialists, the connection between humans and non-humans,

a Latourian expression, is narrowed in reproductive reorganization and in the construction of fertile bodies. All sorts of arrangements are accelerated, whether recommendations, technologies, regulations, research, medicines, or collaborative desires regarding gametes, embryos and uteruses, as well as advertising and the expansion of clinics for what is considered a greater Good, become babies.

When we talk about the human reproduction laboratory, we also observe several networks formed by hybrids where all the elements of a network collect everyone and collect each other. As they are all collected by all the elements, methodologically speaking, they need to be placed in a symmetrical relationship in the same way that Latour and Woolgar (1997) did when looking at the laboratory. Beliefs, values, the processes of change that he calls translation and the processes of science diffusion are part of this socio-technical network. Collectives are formed that, in the Latourian sense, represent the end of the determinism of one aspect over the other and the end of full freedom, given that needs, the existence of material and immaterial elements decide the interconnections to reach a good term with gametes, embryos and pregnancies. There is only mutual and collaborative collective construction (co-construction idea), therefore, collectives are not free, they suffer influences from each other and from different possible connections with interventions and controversies.

These collectives are a considerable range of specialists in assisted reproduction, and an immense range of research, tests, protocols, with particular relevance to the participation of biologists, geneticists, gynecologists, laboratory technicians, biochemists, embryologists and gametes involved in the formulation of the arrangements. reproductive.

Here, the socio-technical network of couples, women and values regarding family, children and kinship relations are very important. Much of what is collected is due to the way in which this collective works, the complexities of treatment networks offered by clinics, the fact that specialists possess high technology, knowledge and research, and decision-making with more confidence. and more pharmacological aggressiveness, or of convincing protocols and networks to provide gametes, equally of access for those who need the treatments.

Technological and scientific advances and research are part of an interventional technological and scientific body, with genetic technology, less documented by clinical examinations and personal conversations, and more focused on the presentation of in vitro fertilization *techniques*, and their derivation . intracytoplasmic sperm injection and preimplantation diagnosis .

Technological advances in the area also mark asymmetries for many countries, which, even doing these procedures, do not follow all the so-called technological innovations, even if this fact does not eliminate the other, that these technologies are globalized and that, if combined mutually build . If a country does not follow the global dynamics and the commodification and internationalization, it stays in other, less competitive collectives and this does not stop producing problems for women and couples who seek these biomedical, technological, pharmaceutical and value collectives for intervention. in child search processes.

This aspect is present in different Latin American countries whose narrative shows the history, the pioneering spirit, the ability to solve difficult cases, the knowledge that it develops through its research and when it absorbs and buys cutting-edge technology is part of a discourse intense, but not necessarily connected with high technology.

4 FINAL CONSIDERATIONS

Brazilian specialists occupy a prominent position in the sharing and internationalization of technologies, research and training and in the visibility at congresses and in the production and dissemination of knowledge through their publications.

These aspects, at the same time, are different from what happened in the 80s, 90s and in the beginning of the 2000s, when clinical concerns were centered on the female body and its infertility, and, although these actions still appear with relevant visibility, they do not are always in the foreground when comparing different research sources.

In any case, we can say that these relationships are more complex today and quite different from the context of political discussion, particularly feminist, which focused on sexual and reproductive rights, especially considering the medicalization of women's bodies and the risks for babies (TAMANINI, 2006). In this previous context, it was above all a matter of understanding how to form, correct and reform the body, in the current one, this is done on cells, gametes and embryos.

Today, an intense work of imagination and clinical practice is organized on the reproductive organs (uteruses and gametes), on hormones and embryonic cells, which is central to the construction, not only of fertility, but also of contemporary subjectivities related to ways of wanting and making children; the temporality of the decision, the conditions for making it and the external supports for the relationship with the sexual act. These realities are possibilities of a new sociotechnic.

It is evident that there is a hybrid collective collecting humans and non-humans in a socio-technical network as analyzed by Latour (2000). However, for Brazil, there is a great regional geographic imbalance; when it comes to the consideration of the place where the professionals who published the analyzed abstracts are located, at the same time, certain centralities in regions such as the Brazilian southeast, which greatly hinders access to treatments.

This aspect has to do with the notion of temporality related to factors that involve the lives of professionals, such as access to information, the ability to self-finance to attend conferences, the ability to articulate contact networks for publications, the places of their training, the conviction about the qualities of the clinic in the place of origin, or in the region, the geographic distances that interpose geographic barriers and aggravate the economic ones for people, the access and the existence of articulated teams that have technical and formative capacity also, and/or the fact that they are in large centers with high demand.

These dynamics are unbalanced regarding the place of insertion in the process of globalization of knowledge, protocols, research and interventions through high technology, it is also reproduced in the

contents of the videos that we analyzed in January 2018, from sources referring to expert testimonials. Those from Brazil and Barcelona focus on investments linked to highly complex science and technology. They talked about embryos, genetic diagnoses, research, while those from Latin American countries, with less international insertion, talked much more about clinical diagnoses such as endometriosis, polyps, ovarian stimulation, ovarian failures present in women's bodies, whose contents are of a phase in which assisted reproduction offered fewer technological resources for treatments and in which much more was required from the clinical perspective.

When these testimonies are compared with those of specialists who focus on highly complex technologies, on genetic research, on embryo intervention processes, the places of the narrative are arranged at different times. When comparing them, it is as if those who are connected to cutting-edge technologies were temporarily in other dynamics and, in other practices, with few concerns regarding reproductive problems arising from the body, from the relationships with emotional and affective factors, from the ovaries, from the gametes or the uterus and tubes. It is observed from these sources that specialists from clinics with lower technological and research investments, without gamete banks, are much more invested in clinical arguments and in case-by-case follow-ups; based on listening to the reproductive history, counseling about exams, using hormones and timed sex (TAMANINI, 2003). This doing also has consequences for the length of time a woman waits, for her hope and burnout, and for how soon she will or will not get a pregnancy.

It is about the production of knowledge and not just intervention, these are knowledge that are expressed in the use of high technology, of new research with embryos, with human organs, cells and with pharmaceutical products involved in the treatment of infertility, as is the preservation of fertility.

Another dimension to be highlighted concerns gendering by sex, which attributes performance to this hybrid architecture with the participation of important differences between areas and specialties, as well as, in the formation of clinic teams, as many specialists as the technical and administrative.

Even if regarding this aspect, there is a process of increasing feminization in publications, in the patrimony of clinics, in their management, and in areas of knowledge such as biology, which connects many networks in this field, and if, many specialists emphasize in their testimonies the importance of teamwork and interdisciplinarity (TAMANINI, 2014).

The sexual division of labor is quite evident in the way in which traditional interests are still reproduced, such as, for example, the responsibility of women to have children and save the world ⁶, speaks present in the testimonies of specialists or, in a much greater female presence in embryology and in the biological sciences - specialties that require repetitive work, concentration, care, responsibility, greater delicacy in the laboratory. While other specialties, such as urology, for example, are male-dominated, as

⁶This statement was collected from an interview with a specialist from an assisted reproduction clinic in the south of Brazil, in research in 2015. The same also completed: "What has to happen we already know: women have to agree that they have to make the offspring the priority of their lives".

well as surgery (considered the most prestigious) is also male-dominated. These hybrid networks, even when they play with nexus of articulation between humans and non-humans, are connectors of gendered inequalities internal to the areas of specialties. Females prevail over males in fields such as social communication, informatics, bacteriology, dermatology, administration, secretariat, coordination, genetics, biotechnology, cytogenetics, cytology; and in other treatments, such as nutrition, acupuncture, massage, occupational health, massage therapy, physiatry, nursing, nursing assistant, clinical embryology, biochemistry, chemistry, pharmaceuticals; in the area of couple support professionals, such as psychologists, psychiatrists, philosophers; in biology, such as reproductive biology, molecular biology, biological sciences, clinical bioanalysis, biostatistics, laboratory reproduction.

Male professionals prevail in specialties such as: infectology and histopathology, rheumatology, radiology and radiotherapy, andrology, oncology and mastology, anatomy and pathology, endocrinology, gynecology, cardiology, cardiovascular surgery, cardiac rehabilitation, phlebology and phleboesthetics, hematology, diagnosis imaging, neurology, neurosurgery, neuropsychiatry, neuropsychology, neuroradiology, pneumology, urology and uroandrology, urogynecology and nephrology, anesthesiology, pediatrics and education, general medicine, respiratory therapy, traumatology and medical emergencies, clinical assistant and sonography, densitometry, reproductive medicine, human reproduction and assisted reproduction, maternal fetal medicine, veterinary, physiatry, sexology, surgery, surgical instrumentation, endovascular, gastroenterology, orthopedics, gynecology and obstetrics; which encompasses techniques and areas such as laparoscopy, hysteroscopy, tocogynecology, gynecological endoscopy, gynecological surgery, climacteric, colposcopy, obstetrics technique⁷.

It was observed, in relation to Brazil and Latin America in general, that there were new insertions of specialties in the field in recent years, compared to the first surveys in 2007 and 2009, as well as a greater entry of women or men in certain areas, when compared to previous studies.

However, as much as the number of professionals has increased, it is observed that main categories, such as gynecology and obstetrics, surgery, human reproduction, anesthesiology, urology, andrology have a greater number of male professionals, while specialties related to care, in fine detail, such as nursing, biology, embryology, couples support professionals are mostly female; these professions are recognized and observed as areas that demand greater care and increased attention in the procedures.

These almost descriptive aspects are part of a hybrid architecture because they involve many elements: such as knowledge, its communication, its networks and its publications and that seek to configure the field to show old and new dynamics of interest and the making of a theme that, not only changes in their relationships with professionals and their choices, but it also changes in relation to what is or is not important within human reproduction, when it is in the laboratory context.

⁷It is important to emphasize that these categories were formed based on the self-description of professionals on the *websites* of the clinics where they work.

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CHAPTER 65

The narration of the experience by the elder Terena: reflections from Walter Benjamin

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ABSTRACT

Based on the role of narrativity in the sharing of ancestral experiences, the present work starts from Walter Benjamin's conception of narration, identifying the ancient of the Terena ethnic group, from Mato Grosso do Sul, as the exemplar of the classic narrator. From this perspective, the ancient is

taken as the authority of a time traveler, whose role in the community is to repress the immemorial experience [Erfahrung] of his people, to preserve them and transmit them to new generations. The work is based on fragments of narratives by teachers from Terena indigenous schools collected by one of the researchers. These fragments are taken as small Benjaminian monads, from which complex illuminations of meanings radiate on the experiences [Erlebnis] of the Terena people and their struggle of resistance against the shattering of their traditions and ways of life. Thus, the objective is to reflect on the fundamental role played by the Terena ancient in the conservation of archaic narrativity, which has the following characteristics: practical sense, authority in the preservation of tradition and guardian of the memory and wisdom of the native peoples, brushing the relevance of these guardians against the grain.

Keywords: Narrator, Narration, Ancient Terena Monads.

1 INTRODUÇÃO

The experience passed by word of mouth is the source to which all narrators have turned.
(BENJAMIN, 2012, p. 214)

In 1936, Walter Benjamin (WB) continued a series of works centered on the modern experience which, at its conclusion, fell into decline due to the shocks caused by the emergence of the great *city*. Still according to Benjamin, modern life produces too many shocks, without time for the proper psychological processing, triggering both repression and sensory anesthesia due to an overdose of stimuli.

Benjamin's classic example of the loss of experience is the case of combatants who returned from the front of the first war silenced, devastated and unable to narrate what happened: "Poorer in communicable experiences, not richer" (BENJAMIN, 2012, p. 213). The anti-war experience, although devastating, considering the barbarity of technical innovations to kill other human beings, would be repeated a few years later, expanding the powers of the human extermination machines, from Auschwitz to Iroshima and Nagasaki.

The reflections carried out in the essay *Der Erzähler Betrachtungen zum Werk Nikolai Leskows* [“The narrator: considerations on the work of Nicolai Leskov ”], reiterates the idea that the narrative faculty would be extinct, as well as the communicability of experience. However, despite the melancholy observation of its retraction, it can be seen in *The narrator* that the faculty of narrating frequently returns in history, being reedited by new narrators who find ways to exchange ancestral and modern experiences, such as Poe 's *Man of the Crowd* . , Proust's *Recherche* , Joyce's *Ulysses* , or in Kafka's general work.

It is in this perspective of rupture and fragmentation of the narrative that WB's ideas cross the reflections of this article, which takes the elder of the Terena ethnic group, from Matogrosso do Sul, as the prototype of the classic narrator, a traveler of the village and of time, whose role in the collectivity is to hold back ancestral experiences of its people, conserve them and pass them on to new generations.

Based on fragments of narratives by teachers from Terena indigenous schools, collected by one of the researchers in the course of his doctoral research, the objective is to reflect, based on Benjamin's fragmentary hermeneutics, on the fundamental role played by the Terena elder in the conservation of narrativity. arcaica, based on at least three main characteristics of the classic narrator of WB: practical sense, authority in the preservation of tradition and guardian of memory and wisdom. These characteristics, of mutual imbrications, allow the elder Terena to act as the *Angelus Novus* of *Theses About the Concept of History* (*Theses*), by WB, whose ethical-historical commitment is to stir up the debris of the storm of “progress” and find the voices silenced from its people oppressed by more than half a millennium of Portuguese invasion. We use the metaphor of history against the grain to corroborate the importance of the *Velho Truncos* as an immense constellation of sociocultural experiences of the *Tereno* people .

2 THE OLD TRUNK PLACE IN “THE NARRATOR” [*DER ERZÄHLER*]

The great narrator always has his roots in the people (BENJAMIN, 2012, p. 231)

In opposition to the neglect and disregard for capitalist relations of production, whose contempt is patent, in WB's essay the old man enjoys great prestige as a guardian of the memory and culture of a collectivity. It is not by chance that his choice falls on the Russian writer Nicolai Leskov , but because of his representation as a scribe from remote communities in the interior of Russia. Leskov was a commercial representative of an English firm and traveled to the corners of Tsarist Russia and collected traditions, knowledge and experiences from peasants, becoming, so to speak, an archaic narrator. It is from him that WB develops an original and profound theory of narration as an intergenerational exchange of experiences, in clear opposition to the solipsistic *status* of the modern novel.

The concept of experience [*Erfahrung*], resignified by WB in *The Narrator* , it is etymologically and semantically linked to the trip. The German word *Erfahrung* [experience] originates from the verb *Fahren* , which is linked to a crossing, a journey, that is, experience is something that accumulates from the

knowledge of those who travel, who come from far away, in time and in the space. So much so that the classic Benjaminian narrator is the sailor or old peasant, both travelers in their own way, “like someone who comes from afar” (BENJAMIN, 2012, p.214).

What covers an authoritative narrative is the substrate of the accumulated experiences, the lived life. Hence the importance that Benjamin attributes to the dying, precisely because he has already completed the trajectory of a lifetime and, even so, in the final moments, he enters the threshold of death to leave final advice to the living. Nowadays, as WB reminds us, no one dares to give advice, let alone to receive it. This is because there is a setback in the communicability of experience, which passes from generation to generation, matured by time and the tedium of a life lived according to natural time and not chronological time; time of more or less, imprecise and interchanged with other temporalities, and not an “empty and homogeneous time”. The maxims of advice that (re)emerge in the narratives are always lurking [a time from now, *Kairos*], as they are strategically taken from a waiting time [Cronos] to tactically convert into a time when Cronos brings back the *Kairós*, in order to echo as millenary practices of mockery of historical contingencies of improbable, but latent, overcoming.

With the brevity of time in modernity, so does memory and, with it, history. The “listening community” disappears and the “mass” emerges, without reference to itself and lost in the avalanche of information. The old narrator, on the other hand, informs nothing, imposes nothing on the listeners, except for his authority that comes from the wisdom gathered in his space-time travels, his raw material. However, he doesn't tell stories as they actually happened, with linear plot or proven cohesion; on the contrary, he feeds his narrative with a “I heard”, “I was told that”, “if I remember correctly”. Who gives meaning to the narrative is not himself, but the listener; this is the depository of the narrative and its continuator.

The old man in *Der Erzähler* occupies a privileged place of anamnesis, of bringing to memory the stories lost in the sands of time; not history with a capital H, but those collected in the heart of community life, in the distension of events signified by the collectivity, always traversed by oblivion. The old narrator presents himself as the guardian of memory, the one who holds back the weight of tradition, protecting the story from death through oblivion. At the same time, he needs to captivate listeners to become narrators, because he knows that when he is no longer among them, the narratives will be remembered.

In Benjamin's essay, the old man has an oracular *ethos* , one that unveils the veil of memories to update the past and give it a new meaning in the present. His wisdom is always pointing, like Janus bifronte, to the threshold portals between the past and the present, between the forgotten and the remembered, between what was and what can be. The allegories that enter the scene cross time, always lacking new meanings. To remind you, the word allegory, of Greek origin, refers both to another [*allos* - *αλλος*] speech and to the other of speech [*agoreuein* - *αγορευειν*]. This is one of the meanings that we can intuit from the Benjaminian conception of the narrative of the old man, a word that holds within itself the respectful Latin meaning of “antianus”, the one that confronts itself with the years, with time, with life and, therefore, has other words, other meanings, other stories to tell. Curious is also the origin of the adjective **old** , which

comes from the Classical Latin *vetulus*, which has an even more archaic origin in the Indo-European *wet* [year], whose meaning is derived from the previous year's harvest - opposing it -, coming to be referred generically by common usage to whatever *comes before*, ancient. At the same time, what comes before updates the past, or as Benjamin says, redeems it from death through oblivion.

As can be seen, this is a very different conception from the current one that has of the elder. As a result of a utilitarian view of the body and mind, everything that is old is currently subject to disposability. More and more new things are getting old, because they are briefly outdated for greater fluidity of the merchandise. In this logic, both the body and the subject are conceived as merchandise, whose productivity has an expiration date. The words relating to those who are no longer “useful” for the system, the retirees, are symptomatic: retired [in practice, yes, because the wear and tear is so great that the subject needs “reform”] and inactive [that is, the one who that lacks activity]. The ethics and culture of work, as a private exploitation of vital forces, ended up excluding the old from the important canons of modernity, relegating it to ostracism and associating it with everything that is decrepit. Therefore, the old man, as a subject, also lacks social importance. Like the soldier who returned from the war, the retiree from alienated work is someone who returns from the front muted, without communicable experiences. It is likely that from this *Zeitgeist* [spirit of the time] Benjamin's statement (2012, p. 213) comes: “People who know how to narrate properly are increasingly rare [...] seemed totally secure and inalienable: the faculty of exchanging experiences”.

There are many interpretations of the melancholy contained in WB's essay, alternating with more or less pessimistic views. However, as we said before, one can find in it a non-melancholic glimpse that concerns the transmutation power of the narrative, that is, as historical conditions have been transformed, the muses are in charge of finding other means of narrative expression. , in order to preserve the reminiscences. Thus, the ancestral oral narrative (epic poetry) acquired a new form, taking refuge in writing, whose immemorial symbology preserved forever the gift of storytelling. Even losing its collective bias, the modern novel protects the narrative from its decline, reappearing through the hands of narrators who usually ask the muses for inspiration in the opening of their writings, such as Homer, Hesiod and Camões, to tell stories that crossed the times while maintaining the their rumor, thus becoming universal classics. As Calvino said (1993, p. 10): “A book that is configured as the equivalent of the universe, similar to ancient talismans, is called a classic”.

This is the theoretical background contextualization that guides the investigation of Terena talismans, their ancient narrators, whose aim is to triangulate narratives by teachers from some visited indigenous schools about the archaic narrative function of the so-called *Old Trunks* based on the archetypes of the benjaminian narrator. But first, we move on to some notes on how to mobilize the Benjaminian constellation of narratives.

3 BRIEF NOTES ON HOW TO OPERATE WITH NARRATIVES IN A BENJAMINIAN APPROACH

Being dialectical means having the wind of history in your sails. (BENJAMIN, 2007, p. 515)

The way of operating with narratives, based on WB's fragmentary hermeneutics (VENTURA, 2019), does not fit into the traditional forms of phrasal analysis, categorizations and content analysis. This is because such forms demand inductive and deductive procedures typical of a logic that Benjamin (2016) called *more geometric* [geometric mode], whose search is for the explanatory exhaustion of the narrative. In a diametrically opposite direction, for the Berliner author, the method of interpreting the phenomena should follow a path of detour, of traces, of excavation of sediments of meaning long buried. He said: “Method this umweg . darstellung als umweg ” [“Method is bypass. Representation as a deviation”] (BENJAMIN, 2016, p. 31). This is because the phenomenon is always a montage, a junction of scraps of stories, a construction of images, always elusive. Hence his interest in images of thought [*Bilddenken*] or of thought as an image. But images, as we know, elude us all the time; and the more they flee the more we try to catch it in the nets of the logical-formal procedure “which tries to capture the truth in a spider's web spread between various forms of knowledge, as if it flew from outside to fall there” (BENJAMIN, 2012, p. 16). This conception is linked to an epistemological procedure that values the pictographic montage of fragments that, glued together in a mosaic, make an image shine that, as the author said, “fly by” (BENJAMIN, 2012, p. 19), because “knowledge it exists only in flashes” (BENJAMIN, 2007, p. 499).

Still according to Benjamin, wherever one deals with history [and stories] one must consider both the movement and its caesura. As we have seen, thought makes itself known through the image [*Bilddenken*], therefore, knowledge is the image of the object that is immobilized, photographed, by the observing subject. Here, in the Benjaminian stellar composition, another important star enters the scene: the monad . About this he says:

Thinking does not only include the movement of ideas , but also their immobilization. When thought suddenly stops in a configuration saturated with tensions, it communicates to them a shock, through which this configuration crystallizes as a monad . The historical materialist only approaches a historical object when he confronts it as a monad . (BENJAMIN, 20212, p. 2012, p. 251)

In several works Benjamin refers to the monad , a philosophical concept by the German philosopher Leibniz, which he re-signified. This “arcane” is recurrent in his works from the study of German tragic drama [*Trauespiels*] to the last writings of *The Theses* . Benjamin mobilized monadology until his last days of life, transforming it into a cognitive and ontological operation for the interpretation of the phenomena to be studied. In the monad , according to him, the micro and the macro of the phenomenon are contained, in a dialectical relationship [“dialectic of immobility” (BENJAMIN, 2007, p. 505)]. There is no

precedence of totality or mere trace, as there is a relationship of dialectical impregnation between these two phenomenal images of the presentation of the idea. The researcher's task, under this understanding, is to “[...] build large constructions from tiny elements, cut out with clarity and precision. And even discover in the analysis of the small individual moment the crystal of the total event ” (BENJAMIN, 2007, p. 502).

Here is what we intend, in an attempt to operate with the Benjaminian hermeneutics: to sketch an image of the important role of the Terena elder in the preservation and continuity of the memories of his people [“the crystal of the total event”] from fragments [“tiny elements”] from the narratives of teachers from Terena indigenous schools.

4 NARRATIVES OF TERENA SCHOOL TEACHERS

The remembrance establishes the chain of tradition, which transmits events from generation to generation. (BENJAMIN, 2012, p. 228)

The research data presented here and analyzed from the Benjaminian hermeneutics, are part of an ongoing doctoral research that investigates how Terena indigenous teachers use traditional knowledge, the important role of the elders in its transmission, and how the transposition to the westernized curriculum.

The collection of the teachers' narratives was carried out in 2021, amidst the wanderings and crossings of one of the researchers through six Terena communities, in the state of Mato Grosso do Sul (MS), thirty-one (31) teachers from municipal and municipal schools were interviewed. indigenous states. The semi-structured interviews were recorded and later transcribed, preserving the interviewees' dialectal oral language [in Terena Portuguese, due to the colonial imposition of the Portuguese language on this ethnic group], through which it is intended to build a kaleidoscope of tributes to the elders narrators of the Terena people. .

From the grand narratives (interviews) two small reports will be extracted, organized in the form of monads , whose function is to make the total event shine, as Benjamin said, the exemplary “rumor” of the Terena narrators’ performance and their influence for the recovery of ancestral wisdom. the risk of extinction at a time of danger. Well, that's what it's all about, since the self-devouring modernity wants to subsume its image and likeness. As Benjamin (2012, p. 243) reminds us in *Theses* : “Historically articulating the past does not mean knowing it 'as it actually was'. It means appropriating a memory, as it flashes at the moment of danger. [...] The danger threatens both the existence of tradition and those who receive it”.

selected two monads to characterize the role of the old narrator Terena in the opportune and necessary articulations and appropriations of the past and present of the history of his people, brushing history against the grain and preserving its memory and identity. The first monad is called “ Cubicá ” and the second, “The eggs of experience”. Let's go to them.

4.1 CUBICÁ

And that enemy has not ceased to win. (Benjamin, 2012, p. 244)

[...] in the old days, my grandfather who is the patron of this school Armando Gabriel. He was the only one who would do the calculation, he didn't talk about area, calculate area. For example of a certain crop, he talks. I don't know if this is what your culture says ... but they used to say the word “Cubicá”! Ever heard of it? “Cubicá”! This one, for example, I have land there. Then he arrived at my grandfather Armando Gabriel and spoke, they said: -Uncle Armando. They used to say: - What I want you to do for me is “Cubicá” this area. So I didn't use the area calculation as we mathematicians know today, right? So this relationship we bring to our students. For example, a word that was used in the past like this word “Cubicá”, right. I don't know about where did that word come from, I don't know, we can also search deeper with our, our ancestors. But that word we already knew was area calculation. Interesting that he had a way of doing this area calculation. But I later came to understand with him that this “Cubicá” is the area. It was to calculate the areas. And we always apply it in the classroom, right! The ancients did this, this type of calculation. I had this notion and we are going to do this type of calculation. (Teacher Terena J3¹)

The narrator, according to Benjamin, is among the wise. From this knowledge comes the practical sense, which underlies the most interesting narratives. Whether fairy tales, Homeric epics or fables, all great narratives rest on the practical or proverbial sense of archaic communities. The inventive genius of Ulysses, the Achilles heel or the dangerous vanity of Narcissus, has its origin in the human capacity to overcome the limits imposed by nature and, at the same time, it sounds like a warning that the creature can turn against its own creator. So the epic narrative keeps with it an ancient gift, that of giving advice. Thus Benjamin (2012, p. 216) refers to this aspect of the faculty of narrative:

It [the narrative] always brings with it, in an open or latent way, a utility. This usefulness can sometimes consist of a moral teaching, or a practical suggestion, or also a proverb or rule of life – in any case, the narrator is a man who knows how to give advice to the listener. But if 'giving advice' sounds old-fashioned today, this is because experiences are losing their communicability. [...] The advice woven into the substance of lived life has a name: wisdom – the epic side of truth – is dying out.

Found in many classic narrators, wisdom is what is most exemplary in the elder Terena, as he extracts his knowledge from the practical experience of solving immediate problems, developing a “practical sense” to which all narrators resort, as in the case of the *Cubicá*, this adaptation of the official surveying.

For political and ideological reasons, surveying never comes to us as *Cubicá*, which probably derives from the process of cubing Terena lands for agriculture. Area calculation is usually thought of as a Western, mainly Pythagorean, invention. Little or almost never is said that this invention is oriental, Egyptian and Mesopotamian, coming from needs linked to agriculture, as is also the case of *Cubicá*. The historian of mathematics Carl Boyer (1974, p. 10) recalls that “The Pythagorean theorem, for example, does not appear at all in the Egyptian documents found, but tablets from even the ancient Babylonian period show that in Mesopotamia the theorem was largely used”. And so it has been with the so-called western science, that is, the contributions of native peoples in the most diverse areas of knowledge are neglected, despising ancient

¹Research subjects will be identified by the initials of their names and the order in which they were interviewed.

traditions, as if knowledge of the world began with bourgeois society and the so-called sciences of nature. This is the case of *Cubicá*, which is not just a tradition, but an example that the ways of seeing the world and intervening in it go far beyond what was pre-established in hegemonic cultures, especially the colonizing ones. As Benjamin (2012, p. 245) well recalled in *Theses*, “There has never been a document of culture that was not simultaneously a document of barbarism”. And more: “The gift of awakening the sparks of hope in the past is the exclusive privilege of the historian convinced that the dead will not be safe either if the enemy wins.” (BENJAMIN, 2012, p. 244). In the specific case here, the “exclusive privilege” belongs to Mr. Armando Gabriel, *Xuve* [Old trunk] Terena who, with a thousand arts of making, to paraphrase De Certeau (2014), hunts [does science] in someone else's land. So make *Cubicá* it is to erect a document of resistance, articulating the past and the present not only to dam the Terena culture, but to protect the dead from death from oblivion and “brush history against the grain” (BENJAMIN, 2012, p. 245).

4.2 FERTILIZING EGGS OF EXPERIENCES

Boredom is the dream bird that hatches the eggs of experience (Benjamin, 2012, p. 221)

Yeah, I lived with him a lot! Because the stories told there, every morning. Terena he, he takes his mate, right! And there, cassava, potatoes were passed around the fire and transmitted this knowledge, right, of the Terena culture. Today is different; today I don't... well, I don't have that environment I used to have anymore. That you get there and get up there and live. That was from the very old culture, from the Terena culture. Nowadays, it's Terena's family, they're farther away because she has to work. So you don't have that moment, that meeting. [...] Yeah, today we have this difficulty, because I don't have many elders anymore, you know, who can talk. (Teacher Terena J2)

In the continuation of the sentence of the epigraph above, Benjamin says that any whisper in the foliage scares the *dream bird*, which is perched on the nest interwoven with activities linked to boredom, that is, those that still preserve a hint of work and shared dialogue, which creates the listening community. The entire passage is this:

The slightest whisper in the foliage scares him. Their nests – the activities closely associated with boredom – have already become extinct in cities, and in the countryside too, they are on the verge of extinction. With that, the gift of listening disappears, and the community of listeners disappears. Telling stories has always been the art of telling them again, and it is lost when the stories are no longer preserved. *It gets lost because no one else spins or weaves while listening to the story*. (BENJAMIN, 2012, p. 221, emphasis added).

What the monad above denounces is precisely the suppression of the traditional rounds of conversations, watered with the flavor of *tererê*, and the perilous twilight of narration, whether because of the imposition of capitalist labor relations undermining Terena subsistence, or because the “Old Trunks” [elders] are dying without bequeathing their wisdom to present and future generations. In another passage, taken from Paul Valéry, Benjamin laments the fleetingness of time and boredom in modernity, impacting the narrative capacity of subjects and the exchange of genuine experiences. He says: “Today's man no longer cultivates what cannot be shortened” (BENJAMIN, 2012, p. 223). In fact, for modern man, time is

an enemy and not an ally. This is because time is spent in isolated and individual experiences [*Erlebnis*], not sedimenting those necessary layers of observation, rest and reflection, which hatch the eggs of experience. It is in this sense that the bird flies and flees in fright. This is a continuous, homogeneous time that goes in a straight line, no matter where. The *Old Terena Trunk* is the opposite of this man, and therefore is the narrator par excellence. He not only tells ancient and traditional stories, he draws from the sap of his life what to tell, as Benjamin said (20212, p. 221), “like the potter's hand in the clay of the vase”. It is with his hands that the narrator Terena builds his stories and not only with his voice. He counts as he makes and drinks mate, when he plants, harvests and prepares manioc and potatoes in the flames of the ancestral fire. And as this artisanal way of life is in decline, the narrative capacity also declines, as there is no longer a stage for the theater of narration.

However, the paths of narrative and its conservation are hermetic and unfathomable. Apparently, many Terena teachers, like the two represented here, were “hooked” by the *Xuve narrators* . This is because without realizing it, they have also become narrators, transporting the bonfires to the classrooms [stealing again the fire of the gods], which can become a new *community of listeners* and where epic exploits can be remembered . of the Terena, restoring their foundational myth.

As is said in the Terena community of Cachoeirinha, such as pagan and Christian civilizations, the Terena have their founding myth, which is narrated more or less like this:

The creation of the Terena people

There was a man named OrekaYuvakae [in other Yurikoyuvakai translations]. This man no one knew of his origin, he had no father or mother, he was a man who was not known to anyone. He was walking in the world. Walking on a path, he heard the cry of a bird looking as if fearfully at the ground. That little bird was the good-bye.

This man, out of curiosity, started to get close. He saw a sheaf of grass, and below it was a hole, and in it there was a crowd, they were the Terena peoples. These men did not communicate and were shaky. There Oreka Yuvakae , holding it in his hands, pulled them all out of the hole.

oreka Yuvakae , worried, wanted to communicate with them and he couldn't. Thinking, he decided to summon several animals to try to make these people talk and he couldn't. Finally he invited the frog to make a presentation in front of him, the frog was successful because all these people laughed, from there they started to communicate and spoke to Oreka Yuvakae who were very cold. (BITTENCOURT; LADEIRA, 2000, p. 22-23)

Like Prometheus or Adam, Yurikoyuvakái emerges as an epic hero to give the Terena fire [knowledge] to soothe them from the cold, in addition to teaching them to speak, cultivate the land and domesticate animals. Varying a little from the classic narratives of a creator god, the Terena are created by a man, that is, they end up becoming creations of themselves. Certainly, Giambatista Vico would have liked this narrative, because in his conception of history the notion of human self-production of civil life is present, humanizing gods and heroes. Says he: “Every heathen nation had its Hercules, son of Jupiter. Varro, very knowledgeable about the things of antiquity, managed to enumerate forty of them.” (VICO, 1974, p. 45). Certainly Varrão did not enumerate Yurikoyuvakai, which must be noted in the telling of the world. Here, then, is the task posed to the Old and New Terena Trunks: brushing their own history against

the grain to once again “pull them all out of the hole”, from the great ditch of official historiography that has repeatedly silenced them.

5 CONSIDERATIONS THAT CANNOT BE FINAL

Nothing is more alien to Benjaminian hermeneutics than the conclusion. Quite the opposite of that, the narratives always deposit seeds wherever they go to bear new meanings and new stories, due to their immanent allegorical condition. As we have seen before, the prefix “allo” always presupposes the other and, consequently, the misrepresentation, the dialogical and dialectical contradiction. So that allegory is always a tributary of new meanings, never being able to exhaust the transcreating mediations of language.

Therefore, we are far from complete. On the contrary, each immobilization of the images of thought absorbed in the research could result in infinite monads, small pieces of history capable of mobilizing an entire life, the life of the Terena. Benjamin (2012, p. 240) said that the narrator's gift is to be able to tell his life, but “his dignity is to tell it all”. Hence the historical importance of the *Xuve*, of the old Terena narrators, because more than telling stories, they restore the traditional memory of their village and identify the new generations with their self-creation, until today resilient and resistant to the attacks of modern barbarism: the invasions of the Portuguese, the Paraguayan army, the railroad, FUNAI or the farmers who (un)officially delimit the village, etc.

With so many *thousand other arts of making*, which would fit in a new essay, the Terena have resisted the most diverse types of violence, as well as the various native Brazilian peoples, pressured between illegal mining, predatory loggers and the unruly expansion in agribusiness, in the face of oblivious eyes of the state.

Xuve Terena is the counter-spring that resists [through the narration] the fragmentation that dangerously surrounds the community, *holding back* not only tradition, but the identity of its people.

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CHAPTER 66

Fernando Pessoa and the book of disquiet: reflective contributions to the studies of portuguese literature

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ABSTRACT

The Book of Disquiet expresses a narrative consumed with anguish, observation, and infinite inquiries. Based on this context, this article aims to analyze

seven excerpts from the mentioned book, written by the Portuguese poet Fernando Pessoa and signed by his semi-heteronym Bernardo Soares. Based on a qualitative methodological approach, the genius of Pessoa is confirmed by providing the writing of the real feeling in the form of prose consolidated by intense subjectivities. At the heart of this observation, it is hoped that this text will constitute a reflective construct for the studies of Portuguese Literature, to encourage discussions about the sagacity of this Portuguese poet.

Keywords: Book of Disquiet, Fernando Pessoa, Writing, Portuguese Literature

1 INTRODUCTORY

Fernando Pessoa, who liked to take refuge in invented personalities to express what he saw and what he felt, says, imagining, that he met Bernardo Soares in a “small pastry house” (café) frequented by both. It was there that Bernardo gave Fernando his “Livro do Desassossego” to read. In fact, Bernardo Soares is just a mask that Fernando Pessoa uses to make personal confessions, like a personal diary, which oscillates between restlessness, boredom, anguish, and a great lucidity and analytical capacity. That's why Bernardo Soares is considered a semi-heteronym, because, as his own creator explains: “the personality being not mine, it is not different from mine, but a simple mutilation of it. It's me minus reasoning and affectivity” (BRIEF NOTE..., [nd], p. 5).

The citation that opens this text appears in the section “Brief note on the work”, from the digital version of the *Livro do Desassossego*¹. In it, we identify the act of Fernando Pessoa² resorting to heteronyms to evidence confessions, demonstrate feelings of the most diverse aegis. Based on the above, this article aims to analyze some excerpts from the aforementioned book, written by Fernando Pessoa, but signed by his semi-heteronym, Bernardo Soares, the bookkeeper's assistant in the city of Lisbon, Portugal. Named by him as “biography without facts”, the aforementioned work presents elements that work with a spelling that corresponds to the marks of the author's life experience. Initialing like Bernardo Soares, he

¹Available at: <http://agrcanelas.edu.pt/blogs/biblioteca/files/2012/11/Livro-do-Desassossego-.pdf>. Access in: Sept. 2022

²“Fernando Pessoa (1888-1935) was one of the most important poets in the Portuguese language and a central figure in Portuguese Modernism. A lyrical and nationalist poet, he cultivated poetry focused on the traditional themes of Portugal and his nostalgic lyricism, which expresses reflections on his “deep self”, his concerns, his loneliness and his boredom. Fernando Pessoa was several poets at the same time, he created heteronyms – poets with their own personalities who wrote their poetry and, with them, sought to detect, from various angles, the dramas of the man of his time. [...]” (FRAZÃO, 2021, *online*).

writes the book based on many feelings, for example, melancholy and depression. What is really conceived is the practice of writing as a kind of method.

It is a fragmentary book, being one of the greatest works of Fernando Pessoa, composed of more than 400 excerpts. A book that can be understood as an extensive poetic prose. Regarding the issue of prose, it is extremely important to mention Pessoa's writing method, considering the following postulates of the author: “[...] saying what you feel exactly as you feel – clearly, if it is clear; obscurely, if it is obscure; confusedly, if it is confused” (SOARES, [nd], p. 115-116). Furthermore, it is imperative to understand grammar as an instrument, a tool for use, and not as a law. It is therefore necessary to write the real feeling, the real emotion. That's exactly what Pessoa does. Feelings written in prose, forming the structure of the work. The *Livro do Desassossego* expresses a narrative consumed by anguish, observation and infinite questions.

Methodologically, the study starts from a qualitative approach, resorting to bibliographic research (GIL, 2008), that is, focusing on our source (the *Livro do Desassossego*) and on the considerations of other authors regarding the reflections of Fernando Pessoa under the name of Bernardo Soares. Thus, in order to effectively understand the work already alluded to, seven excerpts are selected for this article: 6, 46, 90, 126, 167, 197 and 338, among the many that make up the work.

It should be noted that the criterion for choosing these excerpts was based on the materiality of the sayings that each one of them expresses, because, in the understanding of the author of this article, the contents identified in the fragments are understood as valuable reflective contributions to the studies of Portuguese Literature. Furthermore, these excerpts are duly analyzed with the specific purpose of showing the true essence of the writing of this genius poet, responsible for the creation of multiple heteronyms. Structurally, the article is organized into three sections, including this introductory section – the first – and the last – the third – which concerns the conclusion of the reflections made throughout the text. The second section is exclusively dedicated to presenting the analyzes obtained from the selected sections.

2 REFLECTIVE CONTRIBUTIONS

2.1 EXCERPT 6: “I LIVE LONGER BECAUSE I LIVE LONGER”

I asked so little of life and that very little life denied me. A sliver of part of the sun, a field, a bit of peace with a bit of bread, it doesn't bother me too much to know that I exist, and I don't demand anything from others and they don't demand anything from me. This was denied me, as one who refuses to give alms not for lack of a good soul, but in order not to have to unbutton his coat.

I write sadly in my quiet room, alone as I have always been, alone as I will always be. And I wonder if my voice, apparently so little, does not embody the substance of thousands of voices, the hunger to speak of thousands of lives, the patience of millions of souls submissive like mine to the daily destiny, to the useless dream, to hope without a trace. In these moments my heart beats louder through my awareness of him. I live longer because I live longer. I feel in myself a religious force, a kind of prayer, a semblance of a cry. But the reaction against me descends from my intelligence... I see myself on the fourth floor of Rua dos Douradores, I watch myself sleepily; I look over the half-written paper at the vain life without beauty and the cheap cigarette I spend it, I spread it out on the

old blotter. Here I am, on this fourth floor, questioning life!, saying what souls feel!, writing prose like the geniuses and the famous! Here, I, like this!... (SOARES ³, [nd], p. 20-21).

Bernardo Soares begins section 6 with a sentence based on an extremely melancholy content. When saying “I asked for so little life and that very little life denied me”, the semi-heteronym conveys a feeling of injustice, since, in his conception, his requests cannot be characterized as 'big': a away from the sun, a field, a bit of quiet with a bit of bread. Therefore, in their lamentations, this feeling of injustice, provided by life, prevails intensely.

As it is a work of individualist diction, according to the conceptualization carried out by Gonçalves (2012), it is possible to notice a man who suffers poetically in the dark of his abandoned room in a rented room. The book *Livro do Desassossego* deals precisely with life made of moments and this is what can be verified in fragment 6: all the poet's lamentations, or his deepest desires, always refer to the moments of life, of everyday life. The beginning of the second paragraph reinforces the individualistic character of the work: “I write sadly in my quiet room, alone as I have always been, alone as I will always be. [...]” (SOARES, [nd], p. 20). Bernardo Soares himself recognizes his loneliness and also admits that it will accompany him until the end of his life.

There is also a strong presence of an idea of “unease” in that fragment. This “uneasiness” can be characterized as something intrinsic to the poet, making situations that lead him to impatience and restlessness part of his routine. This can be proven with the following passages: “ And I wonder if my voice, apparently so little, does not embody the substance of thousands of voices [...]” / “ In these moments my heart beats louder for my conscience his .” (SOARES, [nd], p. 20-21) .

It can be seen, therefore, that the narrator is very conditioned to develop afflictions and uneasiness, since the work is an exhaustive self-analysis of the self. Notably, it refers to the fact of a subject who has lost his self-image and tries, above all, to look for it in the text through his own writing, coming from a marked melancholy. Gonçalves (2012, p. 12) ratifies these reflections by postulating: “The loss of identity is the maximum degree of generation of unrest in the work. The narrative of the streets through which Soares walks – Baixa Lisboaeta – is the field of conflict of the “I”. Walking through the streets of a city is like walking alone in a crowd.” Next, section 46 will be analyzed.

2.2 EXCERPT 46: “I AM THE SIZE OF WHAT I SEE!”

I passively reread, receiving what I feel as an inspiration and a release, those simple sentences by Caetano de Campos, in the natural reference of what results from the small size of his village. From there, he says, because it is small, you can see more of the world than of the city; and that's why the village is bigger than the city...

"Because I'm the size of what I see and not the size of my height."

Phrases like these, which seem to grow up without my having said them, cleanse me of all the metaphysics that I spontaneously add to life.

³We will refer to all the passages under the name of Soares, since this is the heteronym of Fernando Pessoa when writing the classic work, as already explained in the introductory notes.

After reading them, I arrive at my window on the narrow street, look at the great sky and the many stars, and I am free with a winged splendor whose vibration shakes my whole body.

"I'm the size of what I see!" Each time I think of this sentence with all the attention of my nerves, it seems to me more destined to constellately reconstruct the universe. "I'm the size of what I see!" What a great mental possession. It goes from the well of deep emotions to the high stars that are reflected in it, and so, in a way, there they are.

And even now, conscious of knowing how to see, I look at the vast objective metaphysics of the heavens all with a certainty that makes me want to die singing.

"I'm the size of what I see!" And the vague moonlight, entirely mine, begins to vaguely spoil the half-black blue of the horizon.

I want to raise my arms and shout things of an unknown savagery, to say words to the high mysteries, to affirm a new personality that extends to the great spaces of empty matter.

But I pull back and slow down. "I'm the size of what I see!" And the phrase becomes my entire soul, I put all the emotions I feel against it, and over me, inside, as over the city on the outside, falls the indecipherable peace of the hard moonlight that begins wide at dusk (SOARES, [nd], pp. 64-65).

excerpt , Bernardo Soares highlights thoughts of the heteronym Alberto Caeiro, known for being a poet linked to nature, totally simple, pantheistic, bucolic, who despises any kind of philosophical pondering and asserts that the act of thinking makes vision impossible. He calls himself, therefore, an anti-metaphysician. Soares mentions Caeiro's reflections with the aim of seeking inspiration and freedom and the most brilliant thing: he not only makes a brief mention of the phrases, but also analyzes them through the moments of his life, his emotions.

Initially, it exposes the phrase " Because I am the size of what I see and not the size of my height " (SOARES, [nd], p. 64), stating that phrases of this type cleanse it of all metaphysics added to life, making it the, therefore, an 'antimetaphysician', as well as Caeiro. Further on, he summarizes the phrase for "I am the size of what I see!" (SOARES, [nd], p. 65) and proposes to analyze it. In a first observation, he feels free and it is possible to verify that the sayings contained in that sentence reconstruct the universe. Here, it is important to highlight something: if such a syntagma is capable of awakening in Soares a desire for reconstruction, for change, it allows the poet to give himself completely to his emotions, feeling independent, detached from the ordinary limitations of life, as it is possible to perceive in the penultimate paragraph: " I want to raise my arms and shout things of an ignored savagery, to say words to the high mysteries, to affirm a new personality that extends to the great spaces of empty matter" (SOARES, [nd], p. 65). Having the urge to do things that don't suit your personality is what can be called a rebuilding. The narrator goes in search of it. He is aware of his ability. He knows how important it is to escape limitations to find some autonomy.

Even with the desire to get rid of the current fads, the poet withdraws, containing himself. However, the phrase *I'm the size of what I see!* remains in your soul, sharply intensifying your emotions. It can be seen that this passage shows the figure of a man who assiduously internalizes desires and seeks to understand the considerations of other poets, exploring them according to his experience. Of course, there is one more rant. Regarding the subject, Silvestre (2014, p. 4) contributes with the reflections made, by making the following analysis:

The Book of Disquiet is like a compilation of impressions, of what moves and reaches the bookkeeper. When trying to think about the processes that would lead Bernardo Soares to write, it is possible to collect certain points that are clear evidence that he seeks in his own writing an outburst, an answer, a way to give shape to reflections and, thus, to understand them better.

With the intention of resorting to an understanding of the “I”, of a subjectivity that needs to be elucidated, contested, pondered, we then proceed to the analysis of excerpt 90.

2.3 EXCERPT 90: “IGNORE AS LIFE! FEEL LIKE OBLIVION!”

Recognizing reality as a form of illusion, and illusion as a form of reality, is equally necessary and equally useless. The contemplative life, in order to even exist, has to consider objective accidents as dispersed premises of an unattainable conclusion; but at the same time it has to consider the contingencies of the dream as somehow worthy of that attention to them, by which we become contemplatives.

Anything, as it is considered, is a wonder or a hindrance, an all or a nothing, a path or a worry. To consider it in a different way each time is to renew it, to multiply it by itself. That is why the contemplative spirit that has never left its village, however, has the entire universe at its command. In a cell or in a desert is infinity. In a stone you sleep cosmically.

There are, however, occasions of meditation - and to all who meditate they come - when everything is worn out, everything old, everything seen, even if it is yet to be seen. Because however much we meditate on anything, and by meditating on it transform it, we never transform it into anything other than the substance of meditation. Then comes the urge for life, to know without knowing it, to meditate only with the senses or to think in a tactile or sensitive way, from within the object thought, as if we were water and it was a sponge. Then we also have our night, and the tiredness of all emotions deepens as they are emotions of thought, already deep. But it is a night without rest, without moonlight, without stars, a night as if everything had been turned inside out – the infinite turned inside and tight, the day made black lining of an unknown garment.

It's better, yes, it's better to always be the human slug that loves and doesn't know, the leech that is disgusting without knowing it. Ignore as life! Feel like oblivion! What episodes lost in the white green wake of the ships gone, like a cold spit from the tall helm serving as a nose under the eyes of old chambers! (SOARES, [nd], p. 122-124).

Bernardo Soares, in this passage, makes an evident use of Platonism (PLATÃO, 1975), as we read at the beginning: “Recognizing reality as a form of illusion, and illusion as a form of reality, is equally necessary and equally useless ” (SOARES, [nd], p. 122). To effectively understand the question related to Platonism, as well as the essence of this fragment, it is pertinent to remember that Plato believed that ideas were more perfect than matter, the 'concrete, real' (PLATO, 1975).

In this way, the philosopher was convinced that things experienced and designed only in thought were better and more exquisite and masterful than those built and experienced in the material world, that is, external to thought and imagination. When stating that it is necessary and, at the same time, useless to recognize the real world as a form of illusion and the ideal world as a form of reality, there is a strong Platonism (PLATO, 1975), since there is a mixture of reality (Plato, 1975). matter) with fantasy (illusion).

Furthermore, the semi-heteronym of Fernando Pessoa weaves very philosophical sayings in this passage. An example of this is when he considers the usefulness of writing something cathartic, liberating. In an imaginative sense, everything becomes probable: the environments, the details, the specifications. Bernardo Soares, therefore, focuses on the question of Platonism in a very precise way and, in the work as

a whole, emphasizes the writing of the fictionalization of the self. There is, therefore, a subject who fictionalizes the self.

Bearing these aspects in mind, Soares selects words that can present a meaning of alternation between the real and the imaginary, as can be seen in this passage: meditate with the senses alone or think in a tactile or sensitive way [...]” (SOARES, [nd], 123). The act of knowing without, in fact, being with knowledge and the act of meditating with the senses refer to circumstances that are not based on reality in its global sense. Fragment number 90 shows a complex thought process by the narrator, with ephemeral personal impressions. Next, the analysis is directed to section 126.

2.4 EXCERPT 126: “IN THESE PERIODS OF THE SHADOW, I AM INCAPABLE OF THINKING, FEELING, WANTING”

I have big stagnations. It's not that, like everyone else, I have days upon days to respond in a postcard to the urgent letter they wrote me. It's not that, like anyone else, I put off indefinitely what is easy that is useful to me, or what is useful that is pleasant to me. There is more subtlety in my disintelligence with me. I stagnate in the same soul. I have a suspension of will, emotion, thought, and this suspension lasts for many days; only the vegetative life of the soul – the word, the gesture, the habit – express myself to others and, through them, to myself.

In these periods of the shadow, I am unable to think, to feel, to want. I don't know how to write more than numbers, or dashes. I don't feel it, and the death of the one I loved would make me feel as if it had been carried out in a foreign language. I can't; it is as if I were sleeping and my gestures, my words, my correct actions were nothing more than a peripheral breathing, a rhythmic instinct of any organism.

That's how days go by, I can't even say how much of my life, if added up, wouldn't have passed like this. Sometimes it occurs to me that, when I put this stop to myself, perhaps I am not in the nudity I suppose, and there are still impalpable garments covering the eternal absence of my true soul; It occurs to me that thinking, feeling, wanting can also be stagnation, in the face of a more intimate thinking, a feeling more mine, a will lost somewhere in the labyrinth of what I really am.

Anyway, let it be. And to the god, or the gods, whatever, I let go of what I am, as luck dictates and chance does, faithful to a forgotten commitment (SOARES, [nd], p. 165-166).

The narrator introduces passage 126, exposing that he has great stagnations, that is, an inertia, a stagnation. The stagnation in Bernardo Soares resides in the soul, according to what he reports: “I stagnate in the same soul.” (SOARES, [nd], p. 165). This much-mentioned doldrums often occurs in their daily lives, interrupting the fulfillment of desires, emotions, and thoughts. A suspension of will, emotion and thought that lasts for vast days. It can be seen that the beginning of this passage presents a discouraged poet who does not consider himself able to perform certain activities, for example, writing.

Soares begins the second paragraph by ascertaining his inability to think (consequently, he will not be able to write cohesive texts), to feel (which will intensify stagnation), and to want (here, there is a fortification of loneliness, nostalgia, discouragement, because the poet does not fulfill his wishes, internalizing them in an extremely unhappy way). It is essential to notice the expression “In these periods of shadows [...]” (SOARES, [nd], p. 166). By continuing to read the fragment, the narrator's incapacity is justified by this expression. He, therefore, does not think, does not feel and cannot carry out his desires, his wills, as he experiences a dark moment that compromises his emotional state. The sluggishness present in

his life is not understood as a kind of 'relaxation, rest', but rather as expressions that originate from times of mourning.

These expressions would then be a form of protest by the poet, who does not call himself capable of carrying out his work in the midst of an obscure, gloomy time. That's why stagnations are born. And these stagnations cause the writing of words with little significance, since the author writes random things because he is unable to think during that specific moment: "I don't know how to write more than numbers, or risks" (SOARES, [nd], p. 166). Finally, it seems that Soares is satisfied with his current situation and, for that, he says: "Whatever it is, I'll let it be. And to the god, or the gods, whatever, I let go of what I am, as luck dictates and chance does, faithful to a forgotten commitment" (SOARES, [nd], p. 166). In any case, the narrator will let the facts follow the natural order of things.

By relying on randomness, that is, on writing words with meanings that are not so relevant, for witnessing an obscure time, having "great stagnations", Bernardo Soares writes the segmented *Livro do Desassossego*. At each moment experienced in obscurity, he writes single words, any register that confirms his doldrums. It is worth noting that the time of each human being is not the time "of others", as suggested by Ferreira (2013), in the Dictionary of Bachelardian images, symbols, myths, terms and concepts. The time of each human being cannot be understood as a passage that runs horizontally like the "time of things", nor is it the time of their chronological life. It is, therefore, the time that it takes to live in the fullness of the moment. Bernardo Soares does exactly that: he lives the period of shadows in its entirety, completeness. Next, we go into the analysis of section 167.

2.5 EXCERPT 167: "THE MONOTONY OF EVERYTHING IS, HOWEVER, NOTHING BUT THE MONOTONY OF ME"

I'm in a day where the monotony of everything weighs on me, like a prison entry. The monotony of everything, however, is nothing but the monotony of me. Each face, even if it is the one we saw yesterday, is different today, because today is not yesterday. Every day is the day it is, and there has never been another like it in the world. Only in our soul is the identity - the felt identity, although false, with itself - by which everything is similar and simplified. The world is detached things and different edges; but if we are short-sighted, it is an insufficient and continuous fog.

My wish is to run away. Running away from what I know, running away from what's mine, running away from what I love. I want to leave – not for the impossible Indies, or for the great islands to the south of everything, but for any place – village or wilderness – that has in itself the non-being of this place. I want to no longer see these faces, these habits and these days. I want to rest, oblivious, from my organic pretense. I want to feel sleep come as life, not rest. A cabin by the sea, a cave, even, on the rough terrace of a mountain, can give me this. Unfortunately, my will alone can not give it to me.

Slavery is the law of life, and there is no other law, because it must be fulfilled, with no possible revolt or refuge to find. Some are born slaves, others become slaves, and to others slavery is given. The cowardly love that we all have for freedom – which, if we had it, we would find it strange, for new, repudiating it – is the true sign of the weight of our slavery. I myself, who just said that I would want the hut or cave where I was free from the monotony of everything, which is my own, would I dare to go to that hut or cave, knowing, by knowledge, that, since monotony is of me, would I always have it with me? I myself, who suffocate where I am and why I am, where would I breathe better, if the disease is of my lungs and not of the things that surround me? I myself, who long for the pure sun and open fields, for the visible sea and the entire horizon, who tells me I wouldn't be surprised

by the bed, or the food, or not having to go down the eight flights of stairs to the street, or not go into the tobacconist on the corner, or not exchange good mornings with the idle barber?
Everything that surrounds us becomes part of us, infiltrates us in the sensation of flesh and life, and, drools of the great Spider, subtly connects us to what is close, ensnaring us in a light bed of slow death, where we sway in the wind. .
Everything is us, and we are everything; but what good is this, if everything is nothing?
A ray of sunlight, a cloud that the sudden shadow says passes, a breeze that rises, the silence that follows when it ceases, one face or another, some voices, the casual laughter between them that speak, and then the night where the broken hieroglyphs of the stars emerge meaninglessly (SOARES, [nd], p. 214-215).

As in the previous passage, the poet, in fragment number 167, still goes through stagnation. However, the stagnation in this passage is understood as a monotony, the absence of life and vigor. The narrator experiences a day that weighs him down with the 'monotony of everything'. This 'monotony of everything' encompasses one's own boredom, or, in his words: "monotony of me" (SOARES, [nd], p. 214). According to the poet, everything is different and highlights the information that the faces seen yesterday are not the same in the present, the now, the today. Everything, in fact, changes, transforms, becomes different. There can be no similarities. In Soares' ideas, each day is a unique day and there cannot be another similar: " Each day is the day it is, and there has never been another like it in the world" (SOARES, [nd], p. 214).

As he proceeds with his self-analysis, the narrator reveals that his desire is to escape. Run away from what he knows, what belongs to him, what he loves. He longs to go somewhere other than where he currently resides. The narrator's desire to flee is explained in the following words: "I want to no longer see these faces, these habits and these days. I want to rest, oblivious, from my organic pretense" (SOARES, [nd], p. 214). With this, it is clear to see that Bernardo Soares no longer wants to be in an environment where people can develop the same habits, that is, every day performing the same activities, actions, tasks. This, for the narrator, is something monotonous. Therefore, he prefers to relax, detached from his 'natural pretense'. Soares wants to get rid of the monotony of everything, which is his own monotony.

At the beginning of the third paragraph, the narrator postulates: "Slavery is the law of life, and there is no other law, because it must be fulfilled, without possible revolt or refuge to find [...]" (SOARES, [nd], p. 214). In other words: we are always slaves to something, since there are rules in life. These rules must be followed with austerity. When freedom is sought and not achieved, the feeling of cowardice is born. Everyone loves freedom and, at the same time, there is a certain repudiation, because when freedom is, in fact, desired, individuals become open to changes, to transformations. They are exposed to the new, to everything that was not possible to experience while embodying the position of a prisoner. Thus, when one returns to following certain rules, norms, the role of being a slave is fulfilled, faithful to obeying the monotonous regulated system of life.

The passage under analysis presents philosophical nuances, which are important for the reader to understand the real situation of the narrator. Bernardo Soares starts talking about the monotony of life, goes on to talk about freedom and, finally, he philosophizes in an exaggerated way: "Everything is us, and we

are everything; but what good is it, if everything is nothing?” (SOARES, [nd], p. 215). Everything is nothing and it is useless to change the conclusion reached by Soares. The poet wants to become free. Free from the rules of life, the boredom that inhabits it and the similarities that exist and that make individuals common, with disenchanting singularities, which do not prioritize individualization, the 'unique', the 'different' so emphasized at the beginning of the fragment. Such specificities lead to the reflection that the poet goes through both an external and an internal plane when explaining his anxieties. As Souto (2005, p. 55) expounds, the interminable

[...] the journey to explore the external world in reflection to the internal and vice versa – transit and wandering of a Self (im)possible to Other Selves – leads Pessoa’s enunciating subjects to show themselves in unfolding and fragmentation, as in which they assume various masks. The project of Pessoa’s heteronymy makes itself known through disseminated voices, in echoes that are sometimes confluent, sometimes mismatched, in a process of plurivocal (un) masking – or poetic pretense.

With each fragment, Soares assumes a new anguish, a new melancholy that needs to be addressed. You have a new desire; raises it. Multiple masks are considered to externalize your yearnings. In the meantime, the analysis of section 197 is discussed below.

2.6 EXCERPT 197: “WHAT I WAS AND WILL NEVER BE AGAIN!”

I feel time with enormous pain. It is always with exaggerated emotion that I abandon anything. The poor rented room where I spent a few months, the table in the provincial hotel where I spent six days, the very sad waiting room at the railway station where I spent two hours waiting for the train – yes, but the good things in life, when I abandon them and think, with all the sensitivity of my nerves, that I will never see them and have them again, at least at that precise and exact moment, they pain me metaphysically. An abyss opens in my soul and a cold breath of God’s hour brushes my pale face.

The time! The past! Then something, a voice, a song, an occasional perfume lifts the cloth of my memories in my soul... What I was and will never be again! What I had and will never have again! The deads! The dead who loved me in my childhood. When I evoke them, my whole soul cools down and I feel exiled from my heart, alone in the night of myself, crying like a beggar the closed silence of all doors (SOARES, [nd], p. 250-251).

As in the excerpt number 6, the fragment number 197 has an extremely melancholy content. Right at the beginning, it reads: “I feel time as a huge pain” (SOARES, [nd], p. 250). For the narrator, each passage of time makes him feel pain. It's as if every moment he experiences represents something sad, totally based on a nostalgic and depressing memory. In *Livro do Desassossego*, there are many fragments in which the semi-heteronym of Fernando Pessoa weaves very melancholic sayings. However, the melancholy, in the passage under analysis, becomes more evident. It is pertinent to point out that, by prioritizing the issue of time, the poet creates, at all times, worlds which, for a moment, are his alone. His work is, in fact, an accomplishment. It is a good that always accompanies you. Therefore, the poet is never alone.

The narrator goes on to explain to the reader that, with an exacerbated emotion, many things were abandoned by him: “The poor rented room where I spent a few months, the table in the provincial hotel

where I spent six days, the sad waiting room at the train station itself, railroad [...]" (SOARES, [nd], p. 250), which is valid to note that these abandonments committed by the author contributed to the intensification of the melancholy so prevalent in the enunciative moment of his writing. In fact, the excerpt number 197 can be understood as another outburst of a poet who lives in solitude and analyzes, in detail, all the relevant and irrelevant events of his history, in order to find a real or imaginary meaning. More specifically regarding the noted melancholy, Gonçalves (2012, p. 3) proposes the following reflection: "In melancholy, there is a deep regret in the face of loss through which, a work of mourning, would elaborate it at some point. Absolute refusal to deal with impulses of love and hate towards the lost object". Melancholy is your foundation for externalizing worries.

In the second paragraph, Bernardo Soares is more reflective: "Time! The past! Then something, a voice, a song, an occasional perfume lifts in my soul the curtain of my memories [...]" (SOARES, [nd], p. 251). Here, the poet focuses on the question of remembrance, remembrance, more explicitly. There is, inside him, a voice that reminds him of his moments. Thus, it can be concluded that the aforementioned voice, or, as Soares himself postulates "a song, an occasional perfume" (SOARES, [nd], p. 251), helps in the predominance of consternation. Further on, the poet continues with the exposition of lamentations: "What I was and will never be again! What I had and will never have again! The dead! The dead who loved me in my childhood" (SOARES, [nd], p. 251). The use of verbs in the past tense refers exactly to the idea of an action already completed, finished in time, since everything has been finished and it is no longer possible to change anything, as can be seen in the use of the adverb 'never'.

As it is an adverb that can perform two functions, that of tense or negation, depending on the context of the sentence in which it is inserted, it is necessary to analyze the use of such expression. In this fragment of the *Livro do Desassossego*, the 'never' refers to a negation. So why does the poet employ it when he utters: "That which I was and shall **never** be again!" (SOARES, [nd], p. 251, emphasis added)? The answer to this question is simple: since the passage 197 has a melancholic characteristic, the negation that the adverb 'never' presents excludes, therefore, any possibility of reconquest that may exist in the poet's imagination, transforming him into a reclusive individual. of your memories. It is worth mentioning the use of the demonstrative pronoun 'that' as a way of exploring, with more emphasis, the theme of this fragment. Used twice, this usage refers to the idea of distancing, considering what semantics and traditional grammar determine. Objectively, the meaning of the pronoun 'that' causes a kind of distance between the narrator and his explanatory material.

The outcome of the fragment, in turn, could not be different: an intense charge of melancholy – "[...] alone in the night of myself, crying like a beggar the closed silence of all doors." (SOARES, [s.d], p. 251). Sadness is rooted in the essence of the poet. She will accompany you in your deepest daydreams. In reverie, the subject is aware that he is the author of his fantasy activity. The writer's daydreams, in the case of Fernando Pessoa, who signs as Bernardo Soares, cannot be understood as escapes from reality. Read:

Whether in the labyrinth of oneself, in the silent ability to question reality, in the complex and contradictory worldview that leads to an unlimited awareness of love and *jouissance*, or in the observation of Lisbon – the author’s “biographical” drama – Pessoa experiences, in sensations, observations and reflection, their disillusionment (like a certain lack of hope) in relation to the world (GONÇALVES, 2012, p. 6).

They are verticalizing instants of unutterable significance, transposed into a written work, that is: the *Livro do Desassossego*. Your life, at that particular moment, is bound to absorb sadness. Next, we move on to the analysis of the seventh and final section.

2.7 EXERCISE 338: “EVERYTHING IS COMPLEX, OR SO AM I”

[...]

The geography of awareness of reality is of a great complexity of coasts, very rugged with mountains and lakes. And everything seems to me, if I think too much, a kind of map like the one in the *Pays du Tendre* or *Gulliver's Travels*, a joke of exactitude inscribed in an ironic or fanciful book for the delight of superior beings, who know where lands are lands.

Everything is complex for those who think, and no doubt thought makes it more complex by its own voluptuousness. But those who think have the need to justify their abdication with a vast program of understanding, exposed, like the reasons of those who lie, with all the excessive details that discover, with the spread of the earth, the root of the lie.

Everything is complex, or so am I. But anyway, it doesn't matter because, anyway, nothing matters. All this, all these misplaced considerations from the wide street, vegetate in the backyards of the excluded gods like vines far from the walls. And I smile, on the night when I endlessly conclude these untidy considerations, at the vital irony that makes them emerge from a human soul, an orphan, from before the stars, from the great reasons of Destiny (SOARES, [nd], p. 412- 413).

Fragment number 338, unlike the fragments already analyzed in this work, is based on the definition of *dianoia* – thought (GUERREIRO, 1995). *Dianoia is hypothetical* - deductive knowledge. It is, therefore, the thought that works hypothetically by reasonings that are concluded, in an exact and veridical way, starting with unproven assertions. Such unproven assertions are, therefore, the hypotheses: “As is known, Plato defines *dianoia* as 'dialogue of the soul with itself’” (GUERREIRO, 1995, p. 126).

In the fragment in focus, the predominance of the word 'complex' is perceptible, precisely because *dianoia* is about the real world and is a very discerned expression in the field of mathematics. It can be understood as a mathematical principle with the function of proving. When exposing that “ Everything is complex for those who think, and without a doubt thought makes it more complex by its own voluptuousness” (SOARES, [nd], p. 412), the narrator highlights the complexity that exists when one wants to design a thought. At all times, we weave hypotheses for the most varied situations that we experience in our lives. Therefore, Bernardo Soares considers that the act of thinking makes things more complex out of pure voluptuousness, pleasure. When thinking, from the author's point of view, an understanding is certainly sought to transform a certain assumption into truth, that is, into something that is considered concrete.

Furthermore, Soares emphasizes another point related to complexity: “Everything is complex, or I am” (SOARES, [nd], p. 413). He, when uttering this sentence, can lead us to the idea that the individual is complex. We are complex. We have doubts, uncertainties, insecurities. We live based on hypotheses, on

deductive speculations. Perhaps it is for this reason that the narrator determines himself as complex. Subsequently, nothing matters: if everything is complex for those who think or if everything is complex, or I am the one who is, emphasizing his sayings.

This passage masterfully describes the real definition of *dianoia* : “The geography of the awareness of reality is of a great complexity of coasts, very rugged with mountains and lakes” (SOARES, [nd], p. 412). Guerreiro (1995, p. 132) adds: “[...] in *dianoia*, just one individual dialoguing with his soul or, to use modern terminology, with an alter ego or an imaginary receiver assuming the role of his interlocutor ”. Therefore, knowing reality and becoming aware of the problems that are present in it are facts that imply, above all, the existence of complex thoughts that are constantly built.

3 BY WAY OF CONCLUSION

Writing is forgetting. Literature is the most pleasant way to ignore life. Music lulls, the visual arts enliven, the living arts (such as dance and acting) entertain. The first, however, departs from life by making it a sleep; the second, however, do not depart from life — some because they use visible and therefore vital formulas, others because they live by the same human life.

This is not the case with literature. This simulates life. A novel is a story of what never was and a drama is a novel given without narrative. A poem is the expression of ideas or feelings in language that nobody uses, since nobody speaks in verse (SOARES, [nd], p. 154).

Literature as a simulation of life. This sentence can be constituted as a synthesis of the words chosen to be included in the final section of this article. Although it was not one of the objects of analysis, excerpt 116 of the *Book of Disquiet* expresses, masterfully, one of the functions of literature, so it is incumbent upon us to highlight it. Fernando Pessoa resorts, as pointed out in the introductory notes, to writing the real feeling, the true emotion. Subjectively, feelings are constructed in prose, in order to highlight a narrative nourished by anguish, investigations and multiple questions. This aspect was noticed in the seven analyzed passages. The issue of melancholy, by way of example, was significantly demarcated, since Bernardo Soares sought to develop anxieties and concerns, since the work is characterized by being an exhaustive self-analysis of the self.

Based on a qualitative methodological approach (GIL, 2008), Pessoa's genius is confirmed in enabling the writing of real feelings in the form of prose consolidated by intense subjectivities. At the heart of this finding, it is expected that the present text constitutes a reflective construct for the studies of Portuguese Literature, in order to encourage discussions about the sagacity of the Portuguese poet. It is also expected that the analysis of the excerpts will serve as objects of reflection for Portuguese language classes, considering the indispensability of the teacher to encourage means to guide students to an effective literary reading (SANTOS, 2021) of classic works, such as the that was addressed in this article.

One cannot fail to point out: literature has language as a structuring element. And, considering that many actions are expressed by language and sayings are uttered, one of the relationships established between writing and speech lies precisely in the way thought is engendered to be manifested through

profuse feelings . In the case of Fernando Pessoa, life is dreamed, the dream is planned. It is a knowledge that reflected everywhere in his created universe, something that can be understood as 'Person's universe'. Bernardo Soares is a truly appropriate example of this factor, as he dreams and feels constantly, which is one of his founding idiosyncrasies.

After all, as Fernando Pessoa postulated in his *Desassossego* , right in one of the last sections, “From the Preface to the Fictions of the Interlude” ([nd], p. 727-728): “[...] [Bernardo Soares] is not distinguished from me for the style of exposing. I give the different personality through the style that is natural to me, there being nothing more than the inevitable distinction of the special tone that the very specialty of emotions necessarily projects”. This is the genuine foundation of the philosopher's writing, essayist and poet: the drama of human reflections, achieving success in terms of building himself as the most inspiring Portuguese literary figure in Modernity.

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CHAPTER 67

Fishery agroecology and sustainability in the drylands of Pernambuco, Brazil

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ABSTRACT

Artisanal fishing is a traditional activity and has been experiencing several losses of recognition and rights. Respect for artisanal fishermen and fishermen is fundamental, and they must be recognized for what they develop in their fishing territory and for how they reproduce as social subjects. In turn, Agroecology as an emerging science that studies agroecosystems integrating knowledge of agronomy, ecology, economics, and sociology, supports, from its beginnings, the correct management of natural

resources through forms of collective social action. An approach between artisanal fishing and agroecology based on food sovereignty makes this recognition possible, strengthening fishing agroecology. In this way, this chapter results from a small section of the results of a Technological Extension Network (PET), approved in Public Edict No. 04/2022 of the Pernambuco State Science and Technology Foundation (FACEPE), having as a collaborating institution the Federal Institute of the Sertão Pernambucano (IFSertãoPE – Petrolina Campus) and as a participating entity the Fishermen's Colony Z21 (CPZ21) in the village of Pedrinhas, in the city of Petrolina/PE. It is qualitative research with an exploratory nature and field procedures based on the dialectical method. This chapter demonstrates the main results of the implementation of the PET since the project contributed to the training of students, artisanal fishermen, and the community in general in the acquisition of knowledge on fishing agroecology, food sovereignty, integral use of fish, good production practices, and food preservation. The findings indicated the need for HEIs to provide opportunities for practical and systematized knowledge to fulfill their socio-educational function and to promote the socioeconomic and environmental sustainability of traditional peoples and communities through extension projects.

Keywords: PET; Fisheries agroecology; Sustainable fishing.

1 INTRODUCTORY

One of the traditional activities that, over time, has undergone different losses of recognition and rights is artisanal fishing. Respect for fisherwomen and artisanal fishermen is imperative since they must be recognized for the activities they carry out in their fishing territory, and for the configuration they produce and reproduce as social subjects. An approximation between artisanal fisheries and agroecology based on food sovereignty allows this recognition to be possible, strengthening both artisanal fishermen and agroecological science (SOUZA; GALLAR, 2018).

In Brazil, fisherwomen and artisanal fishermen won rights and access to various policies from 2003 to 2014, but, with the maintenance of the development model, which despite generating jobs, and reducing

poverty and inequalities, maintained the privileges of the agro-export sector and financial capital, resulting in losses for artisanal fisheries (AZEVEDO, 2017).

The normative definition of “artisanal fisherman” was given by Decree-law n° 221/67, in its Art. 26, which defines that this citizen is “one who, registered in the competent department according to the laws and regulations in force, makes fishing his profession or main way of life”. Furthermore, “[...] any act aimed at capturing or extracting animal or plant elements that have their normal or most frequent way of life in water” (BRASIL, 1967, *sp*).

Based on this prerogative, it is possible to affirm that the fishermen are capable of forming arrangements of organizations such as associations, colonies and cooperatives, however, the experiences and the presence of the basic elements must be considered. Each group, in its history, in its social reproduction strategies, its techniques and even in its fishing spaces, has a certain level and organizational design. The arrangement must be adequate to the level of these elements present, without trying to implement models worked on in other activities and with different groups. Always valuing the local culture is fundamental for the strengthening and guarantee of its fishing identity.

In this sense, both artisanal fishermen and family farmers (who practice agroecology and use agroecosystems) have their workplace in nature and daily extract the conditions and guarantees of their social reproduction from it, that is, fishermen also characterized by a “family organization based on not strictly economic criteria”, maintaining a strong relationship with the actors involved and partially with the market, which indicates a certain flexibility in relationships, from which it can withdraw without compromising its social reproduction (ABRAMOVAY , 1998, p. 101 *apud* RIBEIRO, 2005). Therefore, it is relevant to consider that artisanal fishing is an activity of the family, in which it occupies a central role (COTRIM, 2008), being organized in Community Associations, Fishermen's Colonies, Cooperatives, or in other social movements.

According to Guzmán *apud* Caporal (1998), agroecological sustainability is closely linked to the ability of an agroecosystem to maintain its production over time, overcoming ecological tensions, conserving its level of resilience and socioeconomic pressures. Therefore, a sustainable agroecosystem must meet the characteristics of being ecologically correct, economically viable, socially just, culturally adapted and socioculturally humanized.

In the case of food sovereignty, it is based on the principle of respect for the sovereignty of different nations in the formulation of their socioeconomic policies for the production, distribution and consumption of food, in which the participation of traditional peoples and communities is imperative. Food sovereignty postulates the collective attribute of land, water sources and knowledge associated with food production, promoting access to technology through social policies. It also legitimizes autonomy in land and biodiversity management by proposing community control of natural resources (HOYOS; D'AGOSTINI).

Therefore, the research was classified as qualitative, with an exploratory character and with field procedures, based on the dialectical method. This chapter demonstrates the main results of the

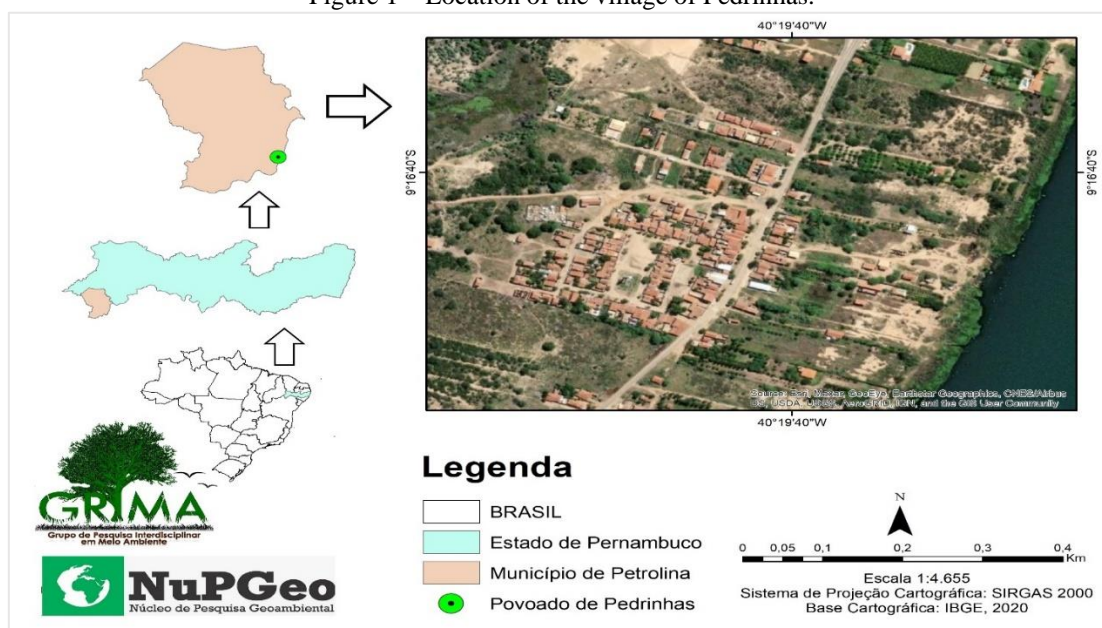
implementation of the PET, since the project contributed significantly to the qualification of students, artisanal fishermen and the community in general in the acquisition of knowledge about fisheries agroecology, food sovereignty, full use of fish and good fishing practices. food production and conservation. The findings indicated the need for HEIs to provide communities with the opportunity to acquire practical and systematized knowledge in order to fulfill their socio-educational role in promoting the socioeconomic and environmental sustainability of traditional peoples and communities, through the implementation of extension projects.

2 METHODOLOGICAL PROCEDURES

2.1 GEOGRAPHIC LOCATION OF RESEARCH

The PET was developed in the village of Pedrinhas, located in the municipality of Petrolina/PE (figure 1). The target audience served were fishermen and artisanal fisherwomen who are members of the Z21 Fishermen's Colony. The village is 30 km from the center of Petrolina, located on the banks of the São Francisco River, and has a spa that is very popular with tourists on weekends and holidays. The town is an old fishing village, where the name has its genesis associated with the small smooth stones that are scattered on the banks of Velho Chico.

Figure 1 – Location of the village of Pedrinhas.



Source: Pacheco, 2022.

CPZ21de Pedrinhas, started its activities in 1998, having a group of partners who fight tirelessly to maintain their livelihood. It also has a massive participation of women, who even not going to the field (in the river to fish), they contribute in a direct and significant way to the processing and sale of the fish product, being artisanal fishing the means of subsistence of the most riverine families.

2.2 RESEARCH TYPOLOGY

The study developed has a qualitative approach, being exploratory, bibliographic and field. The choice of the object of study, the *locus* of the research and the target audience was due to intentionality and accessibility (BARDIN, 2016). In order for the research results to have greater credibility, it was based on the dialectical method, widely used in qualitative research because it assesses that facts cannot be considered distant from a social context.

In this follow-up, dialectics provides grounds for a dynamic and totalizing interpretation of reality, establishing that social events should not be understood independently, absorbed from their political, economic, social and cultural influences (GIL, 2019). According to this author, when a researcher employs dialectical materialism, it is because he emphasizes the historical dimension of social processes, based on the identification of the mode of production in a given society and its interrelations, deciphering the observed facts.

In addition, the study was classified according to its nature as applied, since it aimed to generate new knowledge for the advancement of science with expected practical application, where the findings will be disseminated to the entire community, thus enabling the transmission and debate of the constructed knowledge (*Ibidem*).

Regarding the qualitative approach, it takes into account that there is a relationship between the world and the subject that cannot be quantified. For Gil (2019), the use of this procedure provides a deeper investigation of the issues related to the phenomenon under study and its relationships, through the maximum appreciation of direct contact with the situation studied, seeking what was common, but remaining, however, open to perceive individuality and multiple meanings.

To be in line with the objective, the study was considered exploratory because it intends to be closer to a problem, involves a bibliographic survey, because the subject is little studied and because the approach described here is innovative. Its purpose was to develop, clarify and modify concepts and ideals, substantiating to obtain an overview of the chosen theme, which is generally little explored, constituting a far-fetched literature review. Prodanov and Freitas (2013, p. 51 and 52), argue that exploratory research "has flexible planning, which allows the study of the theme from different angles and aspects [...]" includes bibliographic survey, direct contact with people who they had practical experiences with the researched problem and analysis of examples that stimulate understanding.

From the point of view of technical procedures, it refers to a bibliographic research, where the methodological strategies for this are associated with readings of classic works and articles published in scientific journals and of consistent impact that address the following descriptors: "agroecology", "sustainability", "artisanal fishing", "integral use of fish", "good practices in food production", "fish waste management", in addition to other published theoretical contributions that address the discussed theme.

Bibliographic research, according to Gil (2019), generally has the advantage of allowing the researcher to cover a range of facts from the chosen sources, which must be rigorous in their choice, aiming

at a better approach and discussion of the problem and the theme listed, trying to discover possible inconsistencies or contradictions. On the other hand, field research is characterized by investigating the problem raised associated with the bibliography, in addition to being designed to perform data collection with the target audience.

The practical execution of the project took place in four stages:

- **Stage I** : Initially, the project was elaborated and the idea was presented to the Fishermen's Colony Z21 of Pedrinhas, in order to seek to establish a partnership. After acceptance, the Letter of Consent was signed, in which the entity declared that it was interested in being an integral part of the PET to receive training and be a *locus* of immersion. The project was also presented to the management of IFSertãoPE - Petrolina campus, and then consent was received to participate as a partner entity and the guarantee of full support in carrying out the activities provided for in the PET. In addition, it received the consent of the institution to participate both for the coordination of the project and for the students.
- **Stage II**: In this stage, a training course was held, from June 1 to 15, 2022, lasting 15 (fifteen) days, in the distance learning format *with* synchronous and asynchronous classes and activities, for an audience of 100 (one hundred) people, being students from 05 (five) HEIs at undergraduate and graduate levels (master's and doctorate), from 03 (three) high schools, in addition to the fishing community *locus* of research.
- **Stage III** : The second stage consisted of the selection and monitoring of 10 scholarship students in the immersion and execution of practical extension activities *in loco* at the Food Laboratory (LEA) and CPZ21, lasting 3 (three) months. There was also the certification of the participants of the Training Course and the presentation of the previous results for the Locus of Innovation “ *Sertão Renovável* ” and for the FACEPE team.
- **Stage IV** : In this stage, more fisherwomen were trained in the LEA and a workshop entitled “ *Business Modeling: developing women entrepreneurs* ” was offered. After participating in the workshop, in the practical activities developing (in the laboratory) products derived from fish, the course and workshop certificates were handed over (figure 9). The next step was the production, publishing and submissions for publication of an *E-Book* entitled “ *Integral Utilization of Artisanal Fish Derivatives* ” containing authorial and adapted recipes, valuing the full use of the fish product and by-product .

In this way, at the end of the activities, reports were prepared containing all the results and impacts of the PET, and they were delivered to FACEPE, the institution that promoted the research, and, to IFSertãoPE, the institution that made it possible to carry out, from the logistical support with transport and laboratory structure during the development of practical PET activities.

3 RESULTS AND DISCUSSION

3.1 RESULTS OF STAGE I

At first, the Technological Extension Project entitled “ *Agroecology, Sustainability and Artisanal Fisheries* ” was elaborated and the idea was presented to the Fishermen's Colony Z21 of Pedrinhas, in order to seek to establish a partnership (figure 2). After acceptance, the Letter of Consent was signed, in which the entity declared that it was interested in being an integral part of the PET to receive training and be a locus of immersion.

Figure 2 – Presentation of the project to the locus of immersion entity.



Source: Research Data, 2022.

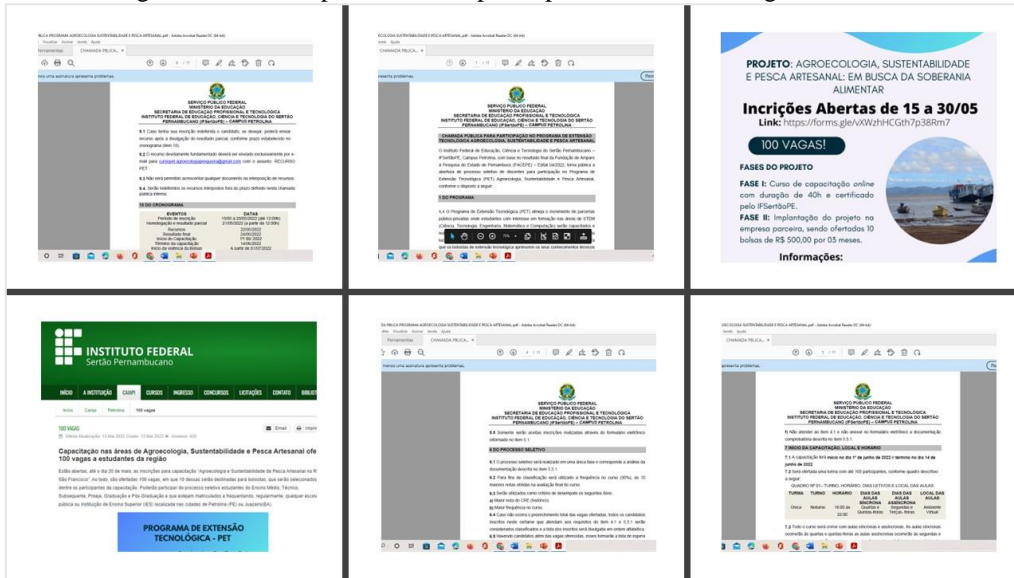
The project was also presented to the management of IFSertãoPE - Petrolina campus, and then consent was received to participate as a partner entity and the guarantee of full support in carrying out the activities provided for in the PET. In addition, it received the consent of the institution to participate both for the coordination of the project and for the students.

3.2 RESULTS OF STAGE II

After the submission of the PET to Public Notice No. 04/2022 of the Fundação de Amparo à Ciência e Tecnologia do Estado de Pernambuco and its respective approval, the project stages began. Seeking to strive for ethics, transparency and social justice, an Internal Public Call was opened for the opening of registrations for the target audience to participate in the training course.

This course was one of the prerequisites for students who were interested in becoming a fellow of the respective project. Therefore, the internal call (figure 3) detailed the project, its objectives and implementation methodology, in addition to discussing the registration process for participation in the course, the number of vacancies available, the target audience, necessary documentation, the requirements to be selected as a scholarship holder, the commitments of the selected scholarship holders, the duration of the project and the value of the scholarships of the scholarship holders to be paid by the funding institution – FACEPE.

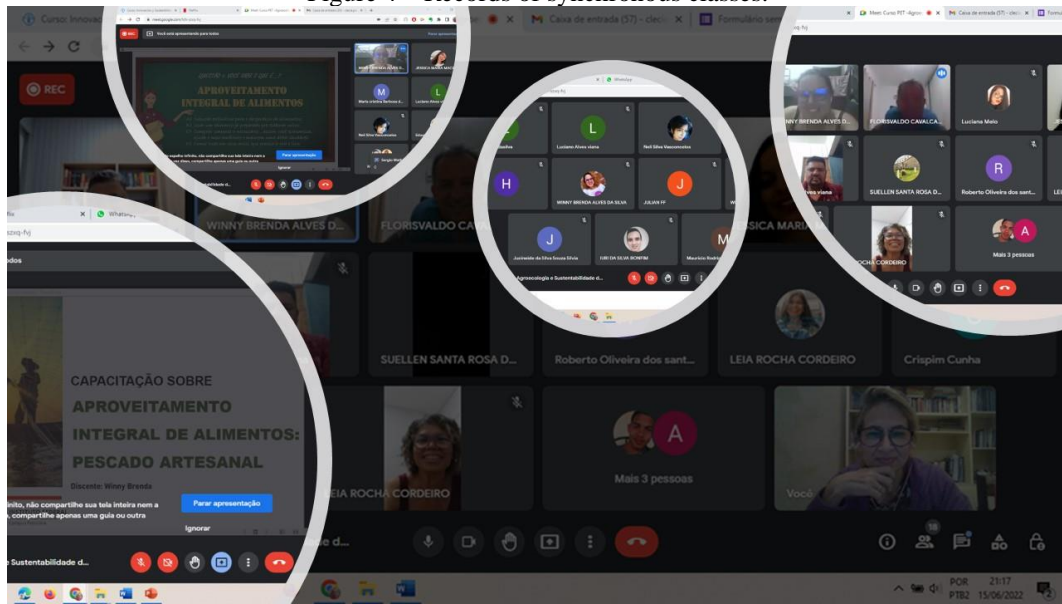
Figure 3 – Internal public call for participation in the first stage of the PET.



Source: Research Data, 2022.

The Training Course took place between June 01 and 15, 2022, in the distance learning format, where the *Google Meet platform* was used to carry out synchronous and asynchronous classes and activities. About 100 (one hundred) people participated in the course, being undergraduate and graduate students (master's and doctorate) from 05 (five) Higher Education Institutions (IES). High school students from 03 (three) public schools in the São Francisco Valley also participated, in addition to fishermen and fisherwomen, members of CPZ21 (as shown in Figure 4).

Figure 4 – Records of synchronous classes.



Source: Research Data, 2022.

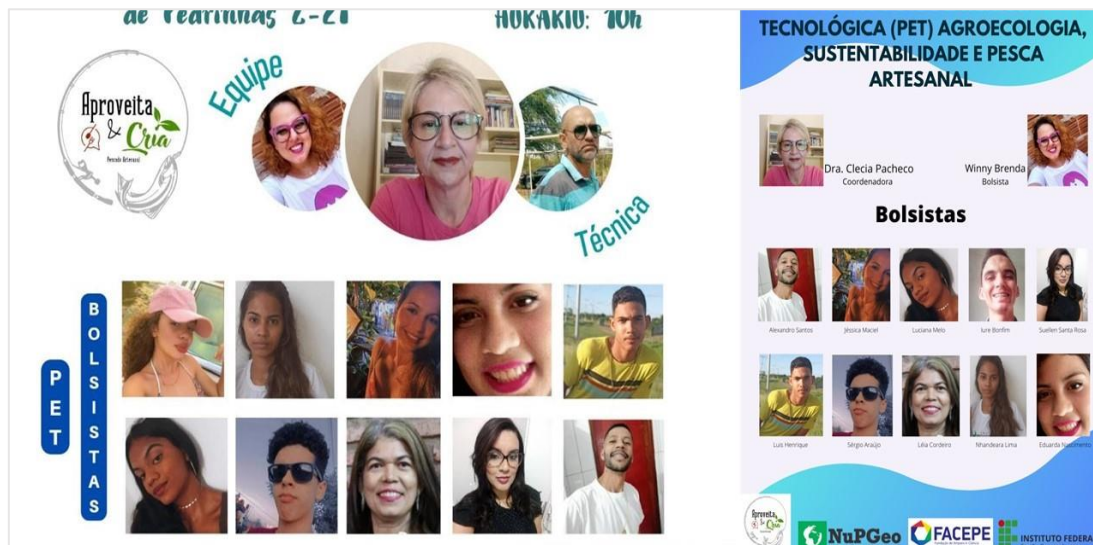
Once the activities of Stage II were successfully completed, the planning and execution of the activities of the next stage began, following the project schedule.

3.3 RESULTS OF STAGE III

The third stage consisted of the selection and monitoring of 10 scholarship students (figure 5) in the immersion and execution of practical extension activities *in loco* at the Food Laboratory (LEA) and CPZ21, lasting 3 (three) months.

The selection of fellows took place in accordance with what was foreseen in the Internal Public Call, where the selection process was carried out in a single phase and corresponded to the analysis of the documentation. For the classification of the student, the following was used: a) the frequency in the course (90%); b) the 10 highest scores obtained in the final evaluation of the course. The following items were used as tie-breaking criteria: a) Highest CRE score (historical); b) Higher frequency in the course.

Figure 5 - Selected Scholars
(PET scholars) (Agroecology, sustainability and artisanal fishery)



Source: Research Data, 2022.

The practical extension activities took place in two moments. In the first moment, culinary practices of full use of fish were carried out at the Food Laboratory (LEA) in IFSertãoPE (figure 6).

For the elaboration of the products in the laboratory, the scholarship holders, under the guidance of the coordinator, prepared the environment and purchased the raw material necessary for the production, as well as the necessary accessories to guarantee a healthy, nutritious diet, without high costs, prioritizing hygiene, good practices, minimal waste generation and significant reduction of environmental impacts.

Figure 6 – Practices developed by scholarship holders at LEA.



Source: Research Data, 2022.

After carrying out the laboratory practices, a demonstration was made for the fishermen and fisherwomen of the CPZ21 in the village of Pedrinhas, through the tasting of the products produced in the LEA (figure 7).

Figure 6 – Tasting of food produced in LEA at CPZ1.



Source: Research Data, 2022.

Finally, the certificates of the training course that took place between June 01 and 15, 2022 were delivered to the participants who are part of CPZ1 (figure 7).

Figure 7 – Certification of the participant in the training course.



Source: Research Data, 2022.

In addition to the activities described, in this stage, the presentation of previous results was also carried out for the Locus of Innovation “Sertão Renovável” and for FACEPE, with the culmination of the stage being the delivery of certificates to fellows who are members of the PET (figure 8) .

Figure 8 – Presentation of previous PET results.



Source: Research Data, 2022.

Therefore, it was possible, once again, to complete another stage of the PET, which among all was the longest and with the greatest amount of practical activities, and it can then be said that another stage was carried out with the success that the project proposed from the beginning.

3.4 RESULTS OF STAGE IV

At this stage, new training was carried out for fisherwomen at the LEA and a workshop entitled “*Business Modeling: developing women entrepreneurs*” was offered. After participating in the workshop, in the practical activities developing (in the laboratory) products derived from fish, the course and workshop certificates were handed over (figure 9).

Figure 9 – Workshop registration, laboratory practices and certification. (Tecnological Extension Network [PET] Agroecology, Sustainability and Artisanal Fishery Workshop Business modeling Entrepreneurs Development)



Source: Research Data, 2022.

The next step was the production, publishing and submissions for publication of an *E-Book* entitled “*Integral Utilization of Artisanal Fish Derivatives*” containing authorial and adapted recipes, valuing the full use of the fish product and by-product.

Therefore, the PET was completed in the foreseen period and with all the activities, contained in the planning, executed successfully. In all, 100 participants were trained (among them students, fishermen and fisherwomen) through the training course, and later, another 20 fisherwomen received bakery courses based on the use of artisanal fish, in addition to receiving the entrepreneurship workshop, seeking to improve their knowledge. of them to undertake from the base activity of economic support of origin.

4 FINAL CONSIDERATIONS

Agroecology is in continuous evolution, constituting an area of science that defends the ecological management of natural resources, in order, through collective social actions of a participatory nature, with a holistic approach and systemic strategies, to return the modified course of socio-ecological co-evolution. Sustainability, on the other hand, is invariably based on a social organization that has concern and orientation in the protection of natural resources and seeks, over time, to expand the harmony of the society-nature relationship.

Thus, fishing is a human activity characterized by a large number of interconnections with many variables in the society-nature relationship, where this relationship has become a social construction, which over time has accumulated knowledge and become complex. for understanding. Thus, addressing the fisheries agroecology is something new and still little known. It is to adapt the principles of agroecological science to fisheries management practices, striving for sustainability.

In this sense, fishermen are a social group of economic and cultural importance in Brazilian society, where, in their fishing activity, they are influenced by environmental externalities promoted by countless social actors that occupy the same system. Furthermore, the production system in artisanal fishing does not only cover technical-economic relationships, but also emphasizes the social and environmental relationships that condition it, being relevant to consider among the types of fishing carried out, the complementarity of resources and the internal coherence and complexity. of the system.

Therefore, the artisanal fishing system is understood by the interactions between social, cultural, economic and environmental dynamics that represent a set of production systems in fishing, and that need attention, high impact public policies, income generation from incentives public-private and, above all, continuing education so that they can understand the relevance of their socioeconomic role, as traditional peoples and communities, in their locus of experiences.

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CHAPTER 68

Use of technologies in the people management area of organizations

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ABSTRACT

This article sought to identify the principal technologies used to develop processes in the People Management sectors in Brazilian companies. In

addition, it was developed aware of the digital platforms implemented in companies, understanding how they contribute to the flow of processes, analyzing which have been the main benefits of being implemented, and finally, realizing which have been the main harms of their implementations. The study consisted of research whose approach is classified as explanatory. The research ranks concerning the focus on qualitative. Regarding the procedures, bibliographical research was used, which consists of explaining issues already published. The research took place on the most requested academic platforms such as Google Academic, Scielo, and Pepsico. It was possible to observe that the literature does not present much data on the subject; however, it is clear that technological innovation contributes to the improvement of people management processes in organizations.

Keywords: Technology. Innovation. PeopleManagement. Psychology. Digital Platforms.

1 INTRODUCTORY

In recent years, with the greater insertion of technology in people's lives, many companies have had to adopt new ways of working, increasing the use of innovative and technological platforms. The importance of technology in the lives of people and companies is observed as a form of education, work, entertainment, communication, shopping, practicality, etc.

Several actions make people's lives easier through the insertion of technology and the internet, such as, for example, communication that has become more agile and easier in our daily lives and contributed to doing anything without having to leave the house due to the practicality of it. (SILVEIRA *et al.* , 2019) .

The history of technology is ancient, it begins with primitive or subsistence people 25 million years ago, where technological knowledge was based solely on the instinct of human survival. (HAYNE; WYSE, 2018).

In a second moment of the evolutionary history, the man already used the artisanal/manufacturing technology in the period of 7000 BC to 1650. Later, emphasizing the mercantilism at the time of 1650 to 1950 and the first movements of the globalization, they generated changes and with that the technology each was increasingly present in people's lives through capitalism (HAYNE; WYSE, 2018).

At the last moment, the production model based on capital accumulation, technology development and economic growth emerged, but there were consequences generating social inequality in the 1950s to 1990s (HAYNE; WYSE, 2018). In future generations, a phase of subsistence or sustainability technology is foreseen, which will sustain the relationship between science, technology and society and which prioritizes social and environmental culture (HAYNE; WYSE, 2018).

With the insertion of increasingly present technology, it was necessary to seek to know several platforms that replace manual work in various organizational processes, such as in the area of People Management.

According to Alves (2017), new technology is the one used to replace procedures previously adopted in the company, such as manual processes, and which seeks new resources in order to resolve conflicts of these processes in companies.

Managers of organizations must think about planning and strategies in order to include themselves in the digital age (Information Technology), as they must identify the appropriate technologies to meet the real needs of the company to change and innovate by facilitating internal processes (ALVES, 2017).).

Analyzing the importance of this implementation of new technologies in the world of work, one of the biggest concerns of these alignments is with the Personnel Management/Human Resources Management sectors, as it deals directly with the human being, that is, technology tools are included in the In companies, the People Management sector allows the various leaders and supervisors to carry out assessments and plan procedures with a clearer and more accessible database (ALVES, 2017).

Given the above theme, it was considered relevant to research which technologies are used in Brazilian companies in order to facilitate internal processes of a People Management sector. The psychology professional, in possession of this information, can contribute to the development of strategies for the insertion of technology within an organizational context.

This research was important to understand the various technologies used in the people management sector in the most diverse companies.

It is important to note that it also contributed to the area of people management so that professionals in this area seek platforms that streamline processes within organizations.

This work was organized as follows, in addition to this introduction: (i) section 2, presents the general and specific objective of the research; (ii) section 3 presents ideas and theoretical constructs related to the use of technologies in the area of people management in organizations; (iii) section 4, presents the research case and the applied methodology; (iv) section 5 presents and analyzes the data; and, (v) section 6, highlights the final considerations (vi).

2 OBJECTIVES

The general objective of this research is to know digital platforms implemented in companies; The specific objectives are: to understand how they contribute to the flow of processes; analyze what were the main benefits of being implemented and realize what were the main harms of their implementations.

3 LITERATURE REVIEW

In recent years, with the greater insertion of technology in people's lives, many companies have had to adopt new ways of working, increasing the use of innovative and technological platforms. The importance of technology in the lives of people and companies is observed, as a form of education, work, entertainment, communication, shopping, practicality, etc.

Technology arises and contributes to the advancement of a society, facilitating our daily life and helping it, it is more effective in the environments we frequent the most as our personal, social and professional environment.

The history of technology is ancient, it begins in antiquity and has evolved over time, along with the human being. With the need for innovations and modernity from the 20th and 21st centuries in the face of these new technologies, the human being had to adapt with the arrival of computers and other technological equipment (cameras, television, cinema, appliances etc) and adapt them in personal and professional life (SILVA, 2018).

In a synthetic way, some of the main changes in the technological environment of computing can be presented. In 1946, the world's first large-scale electronic digital computer, the ENIAC (Electrical Numerical Integrator and Calculator), appeared. In the years 1951 to 1959, the first generation computers were formalized, using their own programming language to calculate fast data; from 1959 to 1965, second-generation computers were created, with more elaborate programming and microsecond processing calculations; From 1965 to 1975, third-generation computers were developed, capable of calculating data in nanoseconds, with a high-level, procedure-oriented programming language; In the period from 1975 to 1981, the fourth generation was launched on the market, with integrated circuits being developed following the line of the third generation; In the 1990s, greater innovation began, with quality software and fast processing being launched; Finally, from the 2000s to the present day, there are computers used in the hand, such as Smartphones, iPod, iPad and Tablets, which make people's lives easier by accessing any information through the internet, with light, fast and thin designs. (SILVA, 2018).

Several actions make people's lives easier through the insertion of technology and the internet, such as, for example, communication has become more agile and easier in our daily lives, it has contributed to us doing anything without having to leave the house due to the convenience of the internet (SILVEIRA *et al.*, 2019).

With the insertion of technology increasingly present in people's lives, it was necessary to seek to know several platforms that replaced manual work in various processes of a business sector, such as People Management.

For Guimarães (2021) the People Management sector is responsible for managing the human capital of companies. This area uses Human Resources (HR) methods and techniques to reconcile the objectives of employees with the goals of these organizations.

Sales (2020) , says that People Management is defined as a set of business strategies that are based on the study of Organizational Psychology, which values Human Capital in companies. It works on employee involvement, training and development. Showing everyone their importance in the team and helping the company achieve better results.

Souza et al (2017), also states that People Management is important for the organization since:

People Management (PM) is a very compassionate area that dominates in organizations, it is a set of practices and policies necessary to lead the managerial position related to people and their aspects. Its mission is to lead people with qualities, efficiency and a lot of productivity to contribute to the objectives of organizations and aligned with Human Resources that direct their strategies and techniques linked to productive work organizations for the best contribution of their subsystems.

The Human Resources/People Management area is fundamental for the entire organization, because through it people and company processes are related to form the organizational structure. (SOUZA et al, 2017).

Based on this, it is possible to understand the importance of information technology and digital platforms applied in a People Management sector.

The Information Technology area provides other business sectors with new actions for the elaboration of processes, services, through information (MCGEE; PRUSAK, 1994).

According to Alves (2017), new technology is the one used to replace procedures previously adopted in the company, such as manual processes, and it seeks new resources in order to resolve conflicts of these processes in companies.

In order to plan these new digital platform strategies, Information Technology is emphasized as one of the most important components of the business environment, as companies widely and intensively use this technology, both at the strategic and operational levels. Furthermore, it provides an increase in managerial productivity, allowing information to be collected with quality (ALBERTIN; ALBERTIN, 2009; MOREIRA; RIBEIRO, 2014).

Managers must think about planning and strategies in order to be included in the digital age (Information Technology), as they must identify the appropriate technologies to meet the real needs of the company to change and innovate by facilitating internal processes (ALVES, 2017).

According to Chiavenato (2010), new technological methods are replacing the traditional ones, in which the most used in People Management training such as: the use of audiovisual resources,

teleconferences, interactive electronic communications, electronic mail (e-mail) and training at a distance or virtual (e-learning).

According to a research carried out at Universidade São Francisco on the technological resources that the people management sector uses, the following result was reached: among the technologies used are ERP systems, intranet, electronic time and HR information systems through the Vetorh software from the company Senior Sistemas (SOUZA et al, 2017).

The author also says that this company, Senior Sistemas, is one of the largest business software development companies in Brazil. The Vetorh product is the technological solution that applies modern and innovative concepts in the strategic management of Human Resources, oriented to the management of Human Capital. Ideal for the decentralization of people management, making them available and accessible by everyone in the corporation, in real time, through the Internet, Intranet, HR portals and mobile devices (SOUZA et al, 2017).

Regarding recruitment and selection, the research also shows that social platforms such as LinkedIn, Facebook, “work with us” etc. are used. Santos and Lima (2018) say that the recruitment process and the selection of people make up the area of human resources, where there is a choice of candidates to take on certain vacancies within a company depending on the personal competence and competence that the vacancy determines.

For Santos (2015 p.3), recruitment through digital social networks is already a reality in our country, but it should not be seen as a substitute for traditional practices, because of this, the recruiter often seeks to establish a knowledge of the individual through these methods but is not entirely based on it.

Having pointed out the main aspects that reveal the main uses of technologies and innovation in companies with reference to the area of people management, then, the results obtained by the bibliographic research on the subject are presented.

4 METHODOLOGY

The purpose of this study is to identify the main technologies used to develop processes in the Personnel Management sectors in Brazilian companies.

Data were obtained through bibliographic research on the subject. According to Cervo and Bervian (1983, p. 55) this type of research explains a phenomenon based on theoretical references already published by other authors in other documents. Therefore, from this review the author must present a result for a situation, that his idea will contribute to science according to his area of expertise.

Martins and Theóphilo (2016, p. 52) report that bibliographic research seeks to explain subjects or themes in references already published in various methodological sources. Bibliographic research is an excellent means of scientific training when carried out independently – theoretical analysis – or as an indispensable part of any scientific work, aimed at building the theoretical platform of the study.

In this research, the chosen approach was the qualitative one, in which the researcher seeks to understand the nature of a social phenomenon, seeking the “source problem” of the same. (RICHARDSON, 1999, p. 79).

Another scientific method used was the explanatory research that seeks to identify factors that determine the occurrence of certain phenomena. (RODRIGUES, 2007)

For this, important bases (tools) that expose information from scientific knowledge were used: Google Scholar, Scielo and Pepsic.

The Google Scholar platform is an extremely important database, as it allows the location of articles, theses, dissertations, etc., facilitating the search for scientific works (SANTOS, 2019).

SciELO (Scientific Electronic Library Online) is a portal that gathers, organizes and publishes on the internet complete texts from Brazilian academic journals and from all over Latin America.(...) Scielo's main objective is to develop a standard methodology for the preparation, storage, dissemination and evaluation of scientific production in electronic format, thus facilitating access and handling of the platform (TUMELERO, 2019).

Finally, the Pepsic library is a virtual source of health information focused on the area of Psychology. (...) This platform contributes to the visibility of scientific knowledge produced in Psychology in Latin American countries, from open access publications, also meaning a great step towards the democratization of knowledge produced in the area (COELHO, 2011).).

As a research procedure, the main keywords on the researched topic were inserted in the aforementioned databases: technology and people management. Articles published in the last 5 years and presenting studies of Brazilian companies were considered valid.

After the selection of publications, they were analyzed according to the research topic and presented in the results of this study.

5 RESULTS AND DISCUSSION DATA PRESENTATION AND ANALYSIS

The present work was carried out with the support of the University Scholarship Program of Santa Catarina – UNIEDU in partnership with the Universidade do Contestado and the Government of the State of Santa Catarina with the scientific research group of the Psychology course at UnC – Concórdia.

First, before carrying out the study in the form of a bibliographic research, the articles relevant to the research topic were filtered, taking into account keywords for the search: “technologies” and “people management”. On the Google academic platform, 55 results were found, searching for materials from 2016 to 2021. Searching pages in Portuguese, sorted by relevance and date. On the Scielo platform, 2 results were found for the period 2015-2020, in Portuguese. Finally, on the Pepsic platform, no results were obtained on the subject. After this first filtering, the articles were selected according to the abstract and the sample in the database remained with 16 articles.

The articles found on the subject are: People management in non-governmental organizations: Characteristics and challenges (2020), Subsidies for creative and intentional action in Brazilian financial institutions (2021), Management of maintenance supported by BIM-FM (2021), System management information: case study in a public information technology company (2020), The Use of Human Resources Analytics in People Management (2021), Survey and analysis of management tools for good corporate governance practices in the billing process hospital (2021), Organizational change in times of a pandemic: A case study in the company Mercur (2021), The Implementation of IT in Administrative Processes: The Case of the Assiduity of a Company that Provides External Maintenance Services (2020), Citizen Communication : gender, race, diversity and collaborative networks in the context of the pandemic (2021), Contribution of people management and HR 4.0 in industry 4.0 (2020), Process and results of the implementation of a hospital information system for the management of university hospitals in Brazil (2021), Difficulties in the Implementation of IT Governance in the Federal Public Administration From the Perspective of People Management (2020), Innovation Strategies for Training & Development : guidelines for investing in intellectual capital (2021), People management by competencies: Competency-based performance management (2021), The role of technology in organizational psychologist practices and their impacts (2021) and People management: Training and development at Visãogeo (2021). The main contributions of these articles are described below.

A bibliographic research was carried out to identify which are the main technologies used to develop processes in the Personnel Management sectors in Brazilian companies and how they work.

In recent years, with the acceleration of information, the most diverse sectors of different companies had to adapt and create ways to optimize processes. This optimization took place through technology which, for the Michaelis Dictionary, can be understood as a set of processes, methods, techniques and tools related to art, industry, education, etc. But nowadays, society experiences Information, characterized by the popularization of the Internet and new technologies, expanded in companies. (TORRES; LIMA, 2021)

Faced with the current scenario of constant technological changes, the market increasingly demands strategic and efficient management of the business, and for this to happen, technologies and the implementation of systems become a great ally of management, as they are able to assist in the management information of paramount importance for organizations, facilitating the use of technological and computational tools, in addition to providing the administration to maximize the knowledge and development of existing segments in the company, from employee productivity to managerial decision making (SILVA; VASQUES; NUNES, 2020).

Silva (2021) reports that the people management sector is and will be increasingly impacted by technology, since the inclusion of systems will be more frequent and greater control of the activity of training and developing human capital.

That said, the information technology area can benefit from the construction and maintenance of processes in people management, such as: cost-effectiveness in accessing data and information from all

authorized parties; there are more options in terms of cost-effectiveness in the management of information systems in the area of people management; can get data directly from the source, providing accuracy in a shorter response time; reducing the distance between people management and internal customers through the integration of processes; and finally, it promotes the corporate globalization of people management information and its accessibility at low costs (KARAKANIAN, 2000 apud SILVA; CASTILHO; HERMOSILLA, 2020).

In this scenario, Denning (2018) suggests people management practices necessary for innovation, so that the sector makes use of technological devices and artificial intelligence, including online training platforms, job rotation, flexible working hours and pay for performance.

The search for technological resources for people management is already a reality. Paiva (2018), conducted a survey on the adherence of these sectors by the digitization of processes and pointed out that 56% of companies are redesigning their programs to leverage digital and mobile tools, 33% of the surveyed teams use some type of artificial intelligence (AI) technology.) to provide solutions and 41% actively develop mobile applications to provide people management services.

The people management sector increasingly invests in technological platforms/systems, mainly in bureaucratic processes, such as time-sharing, vacations, payroll and benefits, as well as employee development processes, recruitment and selection and training.

Silva; Vasques and Nunes (2020) explain a system/platform that assists in the routines of the people management sector, more exclusively the Personnel Department area, the system is called Ergonrio and optimizes payroll, vacation, benefits, and other processes without using paper. In other words, the system is customized, allowing greater flexibility in terms of structural and functional changes, adapting and updating itself in order to always enable better results for its users (people management and other employees).

Another service that can help in optimizing the processes of the personnel department is the digital automation of the employee's time recording, starting to be digitized, as a means of replacing the use of the fixed time clock (SILVA; CASTILHO; HERMOSILLA, 2020).

This online timekeeping platform/application, called Ponto Lite, allows the user to register the entry/exit of work, having as reference its geolocation, confirming the inclusion of data in the system. The system allows the registration of the offline point and temporary storage on the smartphone itself until the user's device is connected to the internet and activates the synchronization, sending the data to the company's people management sector (SILVA; CASTILHO; HERMOSILLA , 2020).

In addition to the platforms aimed at the personnel department, technological innovations were seen for the recruitment and selection processes, training management and skills development for employees.

In the past, the HR sector was not a strategic sector for technologies to be developed in this specific area, but nowadays it is of great interest, even more for large organizations to choose the right talent for their teams and this has made this sector become interesting for new technological solutions (TORRES; LIMA, 2021).

The recruitment and selection process is making room for technology, talent retention (internal or external) can be done through artificial intelligence, reducing operational effort. In other words, within this intelligence, tasks that were previously manual (such as sorting profiles, receiving printed material and contact for a pre-selection) can be performed and stored, thus making routines more agile and making the sector more strategic. (TORRES; LIMA, 2021).

Also Almeida (2004, p.38) announce that with online recruitment, the professional in the people management sector can benefit in the processes of searching for new candidates, seeking information about them, with the purpose of helping in hiring decisions. (...) This online system performs tasks in the talent retention process (attracts and screens qualified candidates, manages CVs, manages information, promotes candidate information for hiring and collection and monitors evaluation and improvement of the process.

In addition, there are tools that make it possible to trace the candidate's behavioral profile even before the initial interview. This is possible from technical skills mapped from questionnaires, with DISC being one of the most common evaluation software methodologies found on the market. This behavioral assessment tool is a personality test applied through questionnaires and forms, which allow the identification of people's behaviors in the environment in which they are inserted and the reasons that lead to certain reactions. One of its main purposes is to predict the behavior of a professional when he is subjected to some type of specific situation. In addition, it aims to detect the strengths and weaknesses of each one (TORRES; LIMA, 2021).

In addition, there are other software that assist in the recruitment and selection process, with the same purpose of evaluating the candidate's behavioral profile, in addition to DISC, namely: Map, PI, gamification platforms, such as Owiwi and Huddle. The choice of these instruments happens for several reasons, among them, the internal demands of the organization, size and personnel administration needs of the company, in addition to the price that is charged for the support and the tool (TORRES;LIMA, 2021).

Even so, technological changes in the recruitment and selection process have extended to sending resumes via video and remote interviews (SANTOS, 2021).

Technological demands in companies, in addition to those already seen, still turn to employee training processes, that is, development training.

In addition to the traditional training model, that is, in person, the author Silva (2021), suggests that companies invest in online training or distance courses, so that individuals do not depend only on groups in order to train themselves, but that they can learn individually and anywhere.

With the technological impact, and especially in recent years, due to the pandemic that affects the way of managing people, many companies reported that they had to adhere to training in the digital environment, as a way of not losing their employees or terminating their employees. same.

The author Santos (2021) sought to find out how these changes were taking place in a company, based on the interview and reports of some employees about online training:

“The company has made available two platforms with an infinity of courses.” (Interviewee 8).(...)
“We are doing training in online facilitation and it is precisely this being very special for our change

in mentality of how much we can interact through the virtual.” (Interviewee 12).(...)“Two courses related to the Teams application were offered to learn about the tool.” (Interviewee 7).

Online training is also being invested in several financial institutions. In this sense, Banco do Brasil SA (2019) diagnoses training needs and offers educational actions also through UniBB, the corporate university, especially with investments in training leaders through the “Mentoria Rede Varejo”, “ATUAÇÃO – Jornada do Inspiring Leader”, “Women's Leadership” and “Strategy and Planning Trail”, which contribute to employee training and investment in the digital world.

Similarly, Banco Bradesco SA (2019) apud Firmino; Vasconcelos (2021) stated that he encourages the training and development of employees through a corporate university (UniBrad), executive coaching programs, mentoring, sponsorship of graduate courses, management development programs, in addition to carrying out competency-based management, performance evaluations, actions aimed at quality of life at work, proposing an attractive benefits program, among others.

Furthermore, the great trend for these online training platforms is the use of gamification process, that is, the more training the employee does and with the best grades, he gets a better ranking, which contributes to the process of training. learning becomes motivating and interactive (SILVA, 2021).

The use of technology in the people management process also allows one to observe the behavior of an employee over the time he remains in the company, which allows for feedback and decision-making by the company. The People Analytics platform or People Analysis translated into Portuguese allows the collection and organization of data analysis on the behavior of individuals through technology. According to SelpeNews (2020), regarding the use of data collected by social networks, internet browsing history, BigData and other sources of digital information, it is possible to evaluate each employee by their behavior and prove their skills and what still needs to be developed. The platform also uses a Chat Bot, which serves to streamline communication and more accurately assess a process in terms of productivity and conflicts, mapping these professionals and suggesting improvements in behavior, as already mentioned (FIA , 2020).

In summary, it is considered that the investigations carried out were important to understand how companies are investing in technological innovations, in order to optimize internal processes, especially in the people management sector, which demands precision in the face of people process.

6 CONCLUSIONS

The new technologies implemented in sectors such as people management are gaining a lot of flexibility in recent times, as it is verified that they bring better results for companies, by streamlining processes and making the environment sustainable.

The study aimed to discover digital platforms implemented in companies; The specific objectives were to understand how they contribute to the flow of processes; analyze what were the main benefits of being implemented and realize what were the main harms of their implementations.

According to the in-depth study on digital platforms in the area of people management, the following results are clear.

With new technologies being implemented, the information technology area can benefit from the construction and maintenance of processes in people management, contributing to a cost-effective access to data and information from all authorized parties; can get data directly from the source, providing accuracy in a shorter response time; reduces the distance between people management and internal customers by integrating processes; and finally, it promotes the corporate globalization of people management information and its accessibility at low costs.

Adherence to process optimization remains frequent, as research by author Paiva says that 56% of companies are redesigning their programs to leverage digital and mobile tools, 33% of surveyed teams use some type of artificial intelligence technology (AI) to provide solutions and 41% actively develop mobile apps to provide people management services.

In view of this, all subareas of the people management sector are starting the digitization process, contributing to activities such as payroll processes, vacations, benefits, and other processes without the use of papers, an example of optimized personnel department processes. it is with the Engorio system . In addition, the sub-area (personnel department) can use the Ponto Lite application, which allows the user to record the entry/exit of work, having as reference its geolocation, confirming the inclusion of data in the system in offline mode. . This system contributes to the employees of companies that need to perform external work, since they can register the point without the need to mark the physical electronic point. In addition, the point record is stored in a system, without the need for people management to use paper and in this way, the organization can intensify sustainability.

In addition to the platforms aimed at the personnel department, technological innovations were seen for the recruitment and selection processes, training management and skills development for employees.

The recruitment and selection processes in many companies are operational (such as the screening of profiles, receipt of printed material and contact for a pre-selection), therefore, using artificial intelligence platforms help since the talent retention process by People management becomes more effective with the system's automatic filtering.

An example of increasing behavioral assessment of online recruitment is the DISC platform (dominance, influence, stability and compliance) facilitating the prediction of the candidate's personality for the vacancy before the first interview, identifying his behaviors within the organizational environment and his main reactions. The platform is important as it streamlines the behavioral trait process by the candidate's recruiter. In addition, there are other software that assist in the recruitment and selection process, with the same purpose of evaluating the candidate's behavioral profile, in addition to DISC, namely: Map, PI, gamification platforms, such as Owiwi and Huddle.

After the employee is hired, the subarea must train and qualify this employee in the role he will perform, so many organizations are changing this process from an in-person model to an online training

model on various digital platforms. An example is financial organizations that adhere to systems called "Corporate Universities", first diagnosing the training needs of each position and offering educational actions with the adhesiveness of e-learning training (corporate education on a digital platform), helping in the agile training of employees .

In addition to training employees, institutions must monitor their performance, in this sense, digital mechanisms such as the People Analytics application (people analysis) allow the people management area together with the employee's manager to measure behavior and prove skills and what still needs to be developed, facilitating feedback processes practiced for the development of people and organizations.

It is worth mentioning that from these results found and seeing the reality of integration of society with technologies, there are still few bibliographic references of the usability of digitization of processes in the area of people management, still organizations are adhering to the practices of improving processes and sustainability with the scarcity of papers. In view of this, institutions should study the possibilities of approving practices like these.

In a second moment, research organizations can verify how the phenomenon of operational change for technological processes happens and suggest proposals for improvement in the face of these new digital platforms and the adherence of institutions.

Given the considerations of this research, institutions need to innovate, because, in addition to contributing to the optimization of people management processes, it reduces paper, pens and other materials, contributing to sustainable practices. Finally, the final result also contributes to people management professionals as a whole, since it may be a way to suggest improvements by joining these platforms to all Brazilian companies.

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CHAPTER 69

Stadiums x covid-19: a new way to twist

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ABSTRACT

Amid the global pandemic, football stadiums have been recruited to fight COVID-19 and others have been used behind closed doors. Thus, this research aims to examine how football stadiums have been utilized in the face of COVID19. The results indicate use as field hospitals, shelters, testing sites, storage for donations and materials, or isolation centers in single cheer for life.

Keywords: Stadiums. Football. COVID-19. Utilize. To cheer.

1 INTRODUCTORY

The new coronavirus (SARS-CoV-2) appeared in the city of Wuhan/China in December 2019. The virus is easily transmitted causing infections to severe respiratory syndromes by the disease COVID-19, with this, it progressed rapidly throughout China forcing the local government to close its doors (MINISTRY OF HEALTH, 2020).

In 2020, it has spread across Asia, Oceania, Africa, and Europe, mainly affecting Italy and Spain. Without delay, it attacks the United States, Canada, and Mexico (BIANCHINI, 2020; BRAUN, 2020). Afterward, it arrived in South America (HALLAL, 2020).

The World Health Organization (WHO) on March 11 declares a global pandemic and governments have adopted countermeasures: quarantine, cancellation of activities that have agglomerations of people, and closings of cities and countries (FOLHA DE SÃO PAULO, 2020b).

Resulting in the drastic reduction of the capitalist system, including sport. In football, FIFA has postponed the qualifiers for the 2022 World Cup Qatar (FIFA, 2020). Italy and Spain canceled matches. The English Premier League stopped, and the French with Ligue 1 ended the league by consecrating Paris Saint-Germain champion. In Holland, the Eredivisie ended without declaring the champion.

CONMEBOL postponed Libertadores and Copa Sudamericana (ESPN, 2020). The championships of Argentina, Paraguay, Uruguay, Ecuador, Chile, Venezuela, Colombia, and Bolivia stopped and/or postponed. In Brazil, the CBF could not even start the Brasileirão, stopped the Copa do Brasil, and, in a cascade effect, the State Championships in progress.

On the opposite side, K-League and Bundesliga, South Korea, and Germany stopped games initially. But, in May, the matches resumed with a medical protocol, without spectators, and behind closed doors, pointing to a scenario of greater hope (DUARTE, 2020).

However, linked to football, are the stadiums or arenas, which are natural stages of the show and depend on the modality to remain active. However, in the midst of the pandemic they were recruited to fight COVID-19 and others have been used behind closed doors. Thus, this research aims to examine how football stadiums have been used in the face of COVID-19.

For the present study, we used the methods of bibliographic and documental research (SÁ-SILVA, ALMEIDA E GUINDANI, 2009). These are distinguished by their sources, conventional writings are used in bibliographic research (articles, theses, dissertations, books, etc.) and in documentary research materials that have not received analytical treatment (reports, photos, videos, reports, etc.). Then, following the precepts of Sá-Silva, Almeida, and Guindani (2009), we organized the text and produced the analyzes within the scope of the study.

With COVID-19 imposing restrictions on football, stadiums were closed and took on a new connotation and a different way of cheering. Now the practices inside the arenas happen with a single crowd or even, unusually, against the virus that hit humanity hard.

From the data collected, we found cases of direct action against COVID-19 around the world. We started with Asia, in South Korea, the Olympic Stadium in Seoul was transformed into a test site serving people who arrive on foot or by car with a “drive-thru” system. In addition, the stadium functioned as a place of quarantine for people who had nowhere to go (RUPTLY, 2020).

In Europe, the Signal Iduna Park, from the German club Borussia Dortmund, was used as a provisional test center (BUNDESLIGA, 2020). Tottenham English was the first in the Premier League to open the doors against the coronavirus, making the parking lot available at the Tottenham Hotspur Football Stadium to serve as a quick test site (VEAL, 2020). In Spain, Real Madrid's Galaticos joined the fight against COVID -19, hosting the Santiago Bernabéu to serve as a depository for medical donations (GLOBO ESPORTE, 2020).

The African continent also adhered to other ways of cheering and transformed Teslim Balogun Stadium, in Lagos/Nigeria, into a center for shelter and isolation of people suspected of or with the disease (TVC NEWS, 2020). In Kenya, Machakos Stadium, by government decision, converted its facilities, including the lawn, to serve as a hospital (CGNT AFRICA, 2020).

Leaving for South America, in Uruguay, the Centenario stadium welcomes homeless people and homeless people in order to contain the spread of COVID-19 (GAZETA DO POVO, 2020). In Brazil, we identified São Paulo (Pacaembu), Fortaleza (President Vargas), Rio de Janeiro (Maracanã/Célio de Barros), and Brasília (Mané Garrincha), all serving as field hospitals to expand the capacity of healthcare services (FREE RATCHET, 2020; FOLHA DE SÃO PAULO, 2020a).

On the other hand, in the leagues that “opened the doors” we find actions to generate the presence of somewhat curious fans, for example, inflatable dolls with posters simulating fans in South Korea; a sound system with chants of fans and boos against the opponent, flags and decorative banners, installation of banners with photos of fans and posthumous tributes to the victims of COVID-19 through the minute of silence (FOX SPORTS, 2020; GLOBO) SPORT 2020b).

2 FINAL CONSIDERATIONS

Football stadiums in the face of COVID-19 act with another purpose, to increase the capacity of health services, contributing to society and presenting only one crowd, that of life. Serving fans as field hospitals, shelters, testing sites, storage for donations, and materials or isolation centers, the stadium and arenas will go down in history as a space that in the pandemic became a hybrid in face of its original function.

In those stadiums that have managed to come back with closed basements, TV cheering habits are more prevalent than ever. However, this action also brought changes in the way of cheering, inserting puppets in place of fans, ambient sound system simulating chants; banners, banners, and solitary flags.

The sport that has always sought to link examples to a healthier life, now sees its installations “hand in hand” for life, in addition to unveiling possible new forms of uses for the act of cheering, which are beyond the standards conventionally constructed throughout history.

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CHAPTER 70

Permeable concrete pavement elaborated with civil construction residue

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ABSTRACT

Currently, with urban expansion, there are two major issues of concern: soil sealing and the generation of

civil construction waste (RCC). Soil compaction and asphaltting make it difficult for water to infiltrate, which can lead to flooding in lower areas. The waste generated, when disposed of irregularly, causes obstruction of roads, the proliferation of vectors, silting of streams and rivers, etc. The use of permeable concrete pavements made with RCC aggregates is an innovative and sustainable solution to this problem. Therefore, this research proposes to incorporate recycled aggregates in the production of structural concrete, for later application in permeable pavements. 2 m² of permeable pavement were built, 1 m² made with blocks containing RCC, and 1 m² with blocks containing natural aggregate. The performance of the pavements was verified through tests of compressive strength and permeability, showing the positive interference of the construction residue in the pavement drainage.

Keywords: permeable pavement; recycled construction aggregate; mechanical and hydraulic tests

1 INTRODUCTION

Nowadays, with the growing increase in the urban demographic aspect, there is a social primacy to propose measures to mitigate the problems encountered and subsidize actions, in the sense of correcting and avoiding future complications in an area favored by urban expansion.

Considering that soil compaction and asphaltting make it difficult for water to infiltrate, which can lead to flooding in the lower areas, the following are worrying issues arising from the rampant expansion of the urban perimeter: soil sealing and the generation of construction waste. civilian (RCC). The use of permeable concrete pavements made with RCC aggregates is an innovative and sustainable solution to this problem.

According to Tucci et al. (2006, apud Alves, 2015), urbanization generates numerous changes in society, being preponderant in the hydrological cycle, such as: reduction of infiltration in the soil and accumulation of water on the surface, which has as a direct consequence the increase in surface runoff and maximum flows; being the main reasons for the occurrence of floods in large urban centers.

NBR 16416:2015 defines permeable concrete as “concrete with interconnected voids that allow water percolation by gravity”. According to Duarte and Kronka *et al.* (2006, *apud* , BELINE, 2019): “Permeable concrete is a type of concrete with a high rate of interconnected voids, prepared with little or no fine aggregate, which allows the unobstructed passage of large amounts of water”.

In Brazil, the standard that regulates the use of permeable concrete in pavements is NBR 16416:2015. Some minimum parameters are required for the pavement to be permeable, including mechanical strength, which may vary according to pavement thickness, use and type. According to scientific research carried out so far, it is known that the recycled aggregate allows a great percolation of water through its structure, on the other hand, the material does not present good resistance to compression. In general, for any pavement to be considered permeable, the standard mentions a minimum compressive strength of 20 MPa and a minimum permeability of 0.1 cm/s.

It is known that the recycling of civil construction waste is currently not used with its full applicability, since only 17 million of the 87.2 million cubic meters of waste produced during a year are reused (Abrecon, 2018).

The recycling and reuse of civil construction waste are great possibilities in sustainable management to minimize the negative effects processed by the construction industry in terms of solid waste generation. In addition, they have a high exploratory potential, since they have unique characteristics, such as the effectiveness in the hydraulic conductivity capacity (OLIVEIRA, 2017).

Furthermore, the use of construction waste, according to Safiuddin *et al.* (2011, *apud* Alves, 2016), solves the disposal problem, reduces landfill space, conserves natural resources, reduces transport costs and environmental pollution, thus protecting the ecological balance.

Therefore, the basic foundation for the development of this research lies in the fact that the use of permeable pavements provided with RCC tends to minimize problems of both soil permeability and the accumulation of construction waste, since recycled aggregates can be used in large quantities. considerable gaps and material voids make it possible to achieve self-draining mixtures.

Finocchiaro and Girardi (2017) developed a research with aggregates from RCC, in which, through the analysis of the compressive strength and the percolation speed of water in the specimens, they observed that the concrete containing recycled aggregate did not present satisfactory results of compressive strength, on the other hand, offered excellent results in terms of water percolation time.

Gentil *et al.* (2020, *apud* Rizvi, 2010) performed compressive strength tests on permeable concrete with recycled aggregate from civil construction, analyzing several traits. The authors verified that, as the content of recycled aggregate in the concrete increases, the values of compressive strength of the mixtures decrease.

According to Monteiro (2010), the consumption of cement is directly proportional to the strength of the concrete and indirectly proportional to the permeability, since the void index decreases considerably with the increase of the binder, thus hindering the passage of water.

Simões (2021) found, with the study of several traces of permeable concrete made with RCC, that the increase in the amount of aggregate significantly decreases the amount of cement paste, thus increasing the void index present in the mixture and the capacity of concrete percolation.

Strieder (2020) also used RCC to make permeable concrete. In his research, traces of 1:3 and a w/c ratio of 0.3 were used, with six concretings being made: one with 100% of natural aggregate and another five with 20%, 40%, 60%, 80% and 100% of replacement of natural aggregate by recycled one. Based on the results, there was approximately a 30% decrease in compressive strength as 100% of the RCC was added.

In summary, the common purpose among the various researches carried out is the primordially in the reduction of waste from civil construction, through its use as an aggregate in the sector itself. This solution, in addition to minimizing the problem of waste disposal, contributes to reducing the use of natural aggregates, which are already scarce, and may also contribute to the insertion of drainage mixtures in paving. However, the use of RCC still needs to be studied and discussed, given the heterogeneity of the material. Therefore, this research proposes to produce permeable concrete with recycled aggregates from RCC and to verify its efficiency in the application of permeable concrete pavements.

2 MATERIAL AND METHODS

Previously, in order to make it possible to apply the permeable concrete blocks, the soil of the settlement site was analyzed through the compaction test, according to NBR 6427:2016 and NBR 7182:2021, Index test Support California (or CBR), following the provisions of NBR 9895:2016, and the study of the permeability coefficient of the soil, which used a permeameter made at the institution itself and which follows NBR 13292:2021, in order to meet the parameters established in Annex B and in table B.2 of NBR 16416:2015. Figure 1 shows the soil compaction, CBR and permeability tests.

FIGURE 1. Soil tests: compaction (left), CBR (center) and permeability (right).



Considering the test results, through calculations, the mechanical and hydraulic sizing of the base layer and sub-base was carried out, guided by Annex B of NBR 16416:2015, reaching the values of 20 cm of gravel 1 for the layer of sub-base and 5 cm of coarse sand, capable of passing completely through the 9.5 mm sieve, to the base layer, thus totaling 30 cm of base/sub-base thickness, following the provisions of NBR 16416:2015, which establishes the use of stone materials of open granulometry for the implantation of the base and/or sub-base, where the specifications of tables 1 and 2 of the referred standard must be met.

Subsequently, the activities of excavation, cleaning, leveling and compaction of the land began, in order to meet the minimum slope of 1% exposed in NBR 16416:2015, avoid irregularities and directly contribute to the draining role of the pavement.

Subsequently, for the manufacture of permeable blocks, the 1:3.5 mix was chosen for its better performance in the mechanical and hydraulic requirements analyzed, based on the results of research by Furini (2021) and Simões (2021). Table 1 shows the consumption of materials used in the research.

TABLE 1. Consumption of materials per line (Kg/m³).

Dosage determination by the IPT method - USP

Dosage managed / Mortar amount / Unitary dosage (mass) a/c relation / Material consumption

Cement-sand-coarse

Cemeny/ sand/ pebble/ CCR

Determinação do traço pelo método IPT - USP									
Traço trabalhado	Teor de argamass	Traço Unitário (em massa)			Relação a/c	Consumo total de materiais (Kg)			
		Cimento	Areia	Graúdo		Cimento	Areia	Pedrisco	RCD
100% pedrisco	0,22	1	0	3,5	0,270	561,441	0,000	1965,045	0,000
60P/40RCD	0,22	1	0	3,5	0,550	561,441	0,000	1179,027	651,426

A control mixture (100% gravel) served as a comparative basis for a mixture containing 40% RCC in place of natural aggregate. A total of 50 rectangular concrete pieces (20x10x6cm) were molded for each analyzed trait, in order to cover a total area of 1.0 m². Cylindrical pieces (10x20cm) were also made for visual and mechanical characterization of the concrete (compressive strength according to NBR 5739:2018).

The molding of the specimens followed the recommendations of NBR 5738:2016. After being removed from the mold, the pieces remained until the test date (28 days) in a humid chamber for complete and effective curing. Molding and curing of the specimens are shown in Figure 2.

FIGURE 2. The casting of concrete blocks (left) and immersion curing (right).



Before laying the pieces, the horizontal stability of the system was guaranteed through the placement of lateral retainers, made of wood and fixed to the base of the floor with the aid of pickets. The application of the concrete pieces was performed manually, respecting leveling, square and alignment. The floor segments of 1m² each were created in an outdoor area, located next to the IFSP Civil Construction Materials Laboratory, Votuporanga/SP campus. Figure 3 shows the stages of soil preparation, as well as the laying of concrete blocks.

FIGURE 3. Stages of execution of permeable pavements



After laying the pavement, in order to verify the *in situ* water infiltration rate, the permeability test, described by ASTM C1701, recently incorporated into NBR 16416:2015, was carried out. With the device properly positioned (Figure 4), the test method described in Annex B of the Brazilian standard was used, where an infiltration ring with 30cm of internal diameter was used, in order to collect the necessary data to obtain the rate of infiltration (k) *in situ*, described by equation (1).

FIGURE 4. Test to obtain the permeability coefficient of pavements



$$k = \frac{C \times m}{(d^2 \times t)} \quad (\text{Equation 1})$$

on what:

k: infiltration rate, mm/h;

m: mass of infiltrated water, kg;

d: inner diameter of the cylinder for all percolated water, mm;

t: time required for all the water to percolate, s;

C: SI system unit conversion factor, with a value equal to 4,583,666,000.

The research was carried out entirely at the Materials Analysis Laboratory and the Soil Mechanics Laboratory at IFSP – Campus Votuporanga, São Paulo, which has all the equipment and materials needed to carry out the research. The RCC aggregate was supplied by the company Mejan Ambiental de Votuporanga-SP and the other materials used, such as gravel and cement (Portland CP V-ARI), were supplied by the institution and acquired in the region itself.

3 RESULTS AND DISCUSSION

Table 2 presents the values of the compressive strength of the control concrete and containing 40% of civil construction waste. Considering that NBR 16416:2015 requires a minimum characteristic compressive strength of 20 MPa, and analyzing the results obtained, it can be said that both concretes meet the standard.

Considering that the addition of recycled aggregate in the mixture causes a reduction in strength (a fact already verified in the literature), research presents reference values many times lower than 20 MPa for permeable concrete produced with aggregate from RCC. Strieder *et al.* (2020) arrived at mixtures with strength values ranging between 12.17 and 24.59 MPa. Faria *et al.* (2019) produced mixtures with values between 14.3 and 26.3 MPa. Tavares and Kazmierczak (2016) reached values ranging from 8.98 to 22.11 MPa. Comparing the results obtained with those found in the bibliography, it is visible that the concrete elaborated fits the expected.

TABLE 2. Values of the compressive strength (MPa) of the studied concretes.
 Dosage / Resistance to compression (Mpa)
 Dosage contro
 CCR

Traço		Resistência à compressão (MPa)					
		CP1	CP2	CP3	CP4	CP5	Média
1:3,5:0,55	TCONTROLE	32,88	33,43	28,30	31,34	33,35	31,86
	40% RCC	20,92	22,54	20,80	23,91	24,15	22,46

In terms of permeability of concrete blocks, NBR 16416:2015 allows evaluating this property through the test described in Annex A thereof or following the requirements of NBR 13292:2021. In this research, we chose to follow the instructions and recommendations in Annex A of NBR 16416:2015, as shown in Figure 5.

FIGURE 5. Permeability test of concrete blocks: control (left) and with RCC (right) .



Considering the results of the permeability coefficient of the concretes (Table 3) and the minimum value established normatively (0.001 m/s), found in Table 3, it is stated that all mixtures complied with the standard. The permeability gain is evident when adding the RCC, increasing the value by more than 64% when incorporating 40% of residue.

TABLE 3. Permeability coefficient k values recorded (m/s).
 Dosage / Permeability Coefficient (m/s)
 Dosage control / average

Traço		Coeficiente de permeabilidade (m/s)			
		k1	k2	k3	Média
1:3,5:0,55	TCONTROLE	0,0112	0,0102	0,0098	0,0104
	40% RCC	0,0185	0,0161	0,0168	0,0171

Evaluating the permeability of the pavements, the infiltration rate (k) *in situ* was obtained, which was 0.0717 m/s for the pavement with RCC and 0.0509 m/s for the control; values well above the 0.0171 m/s found in the specimens studied. Junior (2019) also points out this increase in hydraulic performance in the pavements produced. It should also be noted the efficiency with respect to the permeability of pavements with RCC, which exceeds by approximately 40% the coefficient of the common pavement.

4 CONCLUSIONS

It is a fact that the draining floor presents itself as an efficient alternative in urban drainage and, consequently, in the fight against surface runoff, since it allows the direct reduction of the constant accumulation of water in traffic routes; together with the use of civil construction waste, these floors become extremely useful for planning cities and for improving the population's quality of life. For this reason, the development of permeable pavements with alternative materials that can provide a higher rate of infiltration, as in the case of civil construction waste proposed in this research, becomes of great importance, not to mention the reduction of accumulated waste and the reduction of use of already scarce natural aggregates.

The incorporation of recycled aggregate in the production of concrete pavements is advantageous for its hydraulic performance, since mixtures with 40% of RCC managed to overcome the permeability coefficient of the control mixtures by more than 60%. The mechanical performance results reaffirmed the literature propositions, since the compressive strength suffers damage when adding the residue; fact, however, that did not make it impossible to reach the resistance prescribed by norm.

Finally, the production of permeable pavement makes it possible to verify the effectiveness of recycled concrete in terms of water percolation. In addition, the contribution of the correct preparation of the base that will receive the pavement is noted so that the permeability remains high.

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CHAPTER 71

Petition for writ of mandamus in the Special Court

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ABSTRACT

The law currently understood as the set of norms and customs created to monitor and regulate social relations, as society develops, seeks to submit its operators to new forms of provision of its services whenever a legal provision changes.

In Special Courts, in general, interlocutory decisions cannot be appealed, so there is a wide range of decisions on which there is no provision for an immediate appeal, and this would, in principle, give rise to a greater margin of applicability of a writ of mandamus.

However, as the decisions of the Courts do not go to the respective Court of Justice (TJ), Federal Regional Courts (TRF), or Superior Court of Justice (STJ), these have few instances of standardization of understanding. Well, there is TNU, but it sometimes unifies decisions against the STJ.

Law 9,099/95 does not have any provision regarding the appeal, which is not against the sentence, such as, for example, the innominate appeal. However, with the advent of the laws of the Federal Court and the

Court of the Treasury, provisional protection was provided in the Special Court, with this provision these laws allowed an appeal against the provisional guardianship decision, which is also an innominate appeal, however, follows the logic of an instrument grievance.

The Federal Supreme Court (STF), when defining the topic 77 of general repercussion in 2009, decided that a writ of mandamus is not applicable for interlocutory decisions issued in the cases submitted to the Courts, and these decisions will be challenged when the innominate appeal is filed against the sentence.

Lay judges base their decisions based on art. 38 of Law 9,099/95, which provides for the organization of courts, meeting the principles relevant to art. 2 of the same law, celerity, simplicity, orality, procedural economy.

For this reason, the present work intends as a general objective to understand the filing of a writ of mandamus in special courts, and as a specific objective, to clarify the express reasoning behind the decisions.

Methodologically, the work approaches a literature review, of a qualitative nature, and uses the technical procedures of bibliographic research, using research in books, articles, websites, and abstracts.

1 INTRODUCTION

The law currently understood as the set of norms and customs created to monitor and regulate social relations, as society develops, seeks to submit its operators to new forms of provision of its services whenever a legal provision changes.

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2 HISTORICAL CONTEXT AND INITIAL CONCEPTS

Law is known as a discipline of human relations, given its ability to understand the relationships of natural people, political and cultural development of life in society, its creation is focused on the need for justice and security, however, it is not an invention. mysterious capable of completely transforming human beings and promoting their full development, making social life perfect, but an expression of the will, which groups values and customs promoting order and balance.

It provides for organization and implies the existence of rules, and gains the strength of science that does not meet individual needs, but their collectivity, and all members of the social body must submit to the organism responsible for the order and common good. If the creation of Law is observed, it is understood that it must work according to social development, then undergo alterations, changes, and reinvent itself to guarantee its social function (NADER, 2016).

Turning to this perspective, it can be seen that there is a need to change legal diplomas, to meet the needs of the community. Democracy is not only constituted by a legislator, but by the people, by organized groups, it is influenced by pressure groups and institutions.

In this sense, it can be seen that whenever a norm undergoes changes, legal operators are subjected to new ways of providing their services, Laws are drawn up based on current discussions on the subject that will regulate, observing the advantages and disadvantages for the population to which it will be targeted.

From this perspective, it is understood that Law survives from the constant search for harmony and effectiveness of its norms, so that in practice it is necessary to create bills aimed at modernization, capable of meeting the needs of those who undergo jurisdiction.

Legal principles are institutes that work as guides, being used mainly for guidance, in this way they guide the entire system to which they are related, pointing out the direction in which to follow. Unlike rules, which guide conduct, principles represent the values followed by a given medium. infinity of possible facts and situations (GUERRA FILHO, 2002).

The principles are not only the law, but also the law itself in all its extension and circumscription. From the positivity of the constitutional texts, it obtains the decision-making sphere of the edges, establishing a jurisprudence of values that establishes contemporary constitutionalism, to the point of motivating a new hermeneutics of the courts (ROSENVOLD, 2005).

2.1 HISTORICAL ASPECTS OF THE CIVIL PROCEDURE CODE OF 1973

The alteration of a procedural norm reflects the need for an analysis of the social context in which it is inserted, the changes that contribute to the growth of society and the laws have the ability to provide for the organization of these changes.

Brazil was experiencing a period of great chaos between the years 1964 to 1985, the period of the military dictatorship, after the government of Getúlio Vargas, in 1945, the country went through a period of successive revolutionary movements (SOUSA, 2017).

The period referenced by the author opened doors to the struggles of capitalism against socialism, establishing chaos, repression, torture and censorship of the media, the need arose for a restructuring of the democratic regime in Brazil.

During militarism, Brazil was ruled by the armed forces, high positions were held by army generals, in this sense Emerson Santiago highlights the need for control and changes, in the quest to protect rights and impose duties (SANTIAGO, 2017).

The 1939 code suffered numerous criticisms, since its creation there were gaps that still needed corrections, the insufficiency of the legal text was pointed out as one of the biggest problems, given that the then device did not regulate all matters that guide Civil Procedural Law. Brazilian, in addition to not meeting the social and cultural needs of the community to which it was inserted.

It was during this period that the Civil Procedure Code of 1973 emerged, “through the draft presented in 1964 by the notable Brazilian jurist Alfredo Buzaid , at the request of the then Minister of Justice, Oscar Pedroso Horta”. The code had foreign legislation as one of its main sources, based on German, Italian, Portuguese law, among other influential procedural laws.

In 1963, the Institute of Civil Procedural Law promoted a national congress, with the purpose of examining and criticizing the preliminary project. In the reasons for his work, Alfredo Buzaid states that as

soon as he received the challenge, he thought of reorganizing the code, reforming the 1939 code, so that it would be possible to continue the path already trodden.

But the author ended up understanding the impossibility of the reform, when analyzing the legal diplomas and realizing that it would be more difficult to restructure the current code than to produce a new one.

In this way, the Legislator was not just looking for something new, he was looking for a total reform, able to accommodate the demands of Civil Procedural Law, and not only to implement improvements for the parties, but to improve the functioning of the entire jurisdiction, aimed at the insertion of principles, better judicial organization and capacity to promote greater satisfaction in the jurisdictional provision of the state.

After the delivery of the draft by Professor Luiz Antônio de Andrade to Buzaid , it was submitted by the government for review by a commission, made up of proceduralists, José Frederico Marques, Luís Machado Guimarães and Luís Antônio de Andrade, for approval.

PL nº 810/1972 had its matter submitted to the Chamber of Deputies, obtaining approval. Entitled Law No. 5,689 of January 11, 1973, approved and published in the Federal Official Gazette, respecting the period of *vacatio legis* for its entry into force.

Reviewing and including are part of the process of social transformation, as society develops, more relationships need to be harmonized, the anticipation of guardianship, for example, is an institute that allows the party to anticipate a decision on the merits, as a urgency, as long as the legal requirements are proven, and the legislator's concern to attend to health causes, for example, or to enable the judge to protect a clear and certain right, in addition to resolving the causes described in law, the legislator values the principle of procedural celerity .

From the above, it can be seen that the code met the purposes for which it was created, due to social changes, the Law needs constant updating, which leads us to change by the CPC of 2015.

2.2 HISTORICAL ASPECTS OF THE 2015 CIVIL PROCEDURE CODE

In order to meet social aspirations, the president of the federal senate, José Sarney, through act no. 379/2009 establishes a commission with 12 notable jurists, and some political professionals for the edition of a new code of civil procedure. On June 8, 2010, the bill and the explanatory memorandum were delivered by the then Minister Luiz Fux to Senator José Sarney, who submitted it to the Federal Senate through Bill No. 166/2010- PL 166/2010.

The new code came into force on March 18, 2016, with the aim of modernizing Brazilian Civil Procedural Law, given that the previous code was created in 1973, which predates the Federal Constitution of the Republic of 1988, and since then the social scenario has undergone numerous transformations.

Alexandre Flexa , Daniel Macedo and Fabricio Bastos (2016, p. 08) when commenting on the explanatory memorandum of Law nº 13.105/15, point out some causes that make the procedural process difficult.

The existence of a provision prior to the federal constitution was a matter of concern, the Civil Procedure Code of 1973 was created in another model of government, despite the existence of the democratic state of law, the social reflexes were diverse, today we do not experience the process of repression, nor a process that makes access to justice difficult, but much has been heard about opening the doors to an agile and simplified justice.

Elpidio Dolnizete, in his book *Curso Didático de Direito Civil Procedural Civil*, discusses the perspective of a new code capable of meeting social aspirations for justice and effectiveness, different from the legislation of 1973, which, despite having been considered adequate, was outdated (WAMBIER, 2010).

The commission understood the need for effectiveness in judicial provision, since we are facing the era of the electronic digital process, and simplicity of procedural demands, the insertion of a constitutional procedural law with an emphasis on principles, the so-called neoprocessualism , and the creation of institutes that facilitate access to justice such as conciliation, mediation and arbitration.

The law cannot fail to meet the purpose for which it was created, but it needs structuring and means to subsidize satisfactory decisions in the demands it is intended to meet, neoconstitutionalism is aimed at the application of fundamental rights and guarantees in conjunction with Procedural Law Civil, weakening the current that understands that the constitution would depend on ordinary law to be applied to private relations.

The new civil procedural system is promising, and has sought to solve the proposed problems, failing to see the process uncompromising from its fundamental nature of conflict resolution, in order to fulfill the constitutional values.

3 SPECIAL COURTS

3.1 HISTORICAL ASPECTS OF LAW N. 9099/95

After the entry into force of the civil procedure code of 1973, a new era was established for Civil Procedural Law, with the aim of renewal, a great ideal framework for access to justice, the changes were very promising, but many institutes were unable to present success of their proposals (ROCHA, 2016).

It was through a movement of jurists, completely dissatisfied with the form of judicial provision, the slowness in the judiciary's performance, that a meeting was born in Rio Grande do Sul to discuss the institute of conciliation as an alternative way to help reduce the flow of demands. in justice.

Thus, conciliation and arbitration councils with adjudicative function were created in Rio Grande do Sul, they acted without legal discipline, they were part of the forensic expedient, in São Paulo informal conciliation boards were implemented where they also began to operate with great success.

The new waves of conflict resolutions were having positive results, taking advantage of favorable public opinion, the federal government took the opportunity to meet with the commission of jurists and prepare a bill capable of disciplining within the judiciary the creation of a new organ.

The commission made up of Grinover, Kazuo Watanabe, João Geraldo Carneiro, Cândido Rangel, Ada Pellegrini and other renowned jurists, decided to play a role in a Small Claims Court model, focused on conciliation, along the lines of those that already existed in various parts of the world. and that was already foreseen in our Federal Constitutions since 1934, but that were never implemented.

Submitted by the executive power the bill n. 1950/83 was approved by the National Congress and becomes Law No. 7,244, of 11/7/84, the novelty of a court to legislate on small claims, as it was known, spread among the states and paved the way for several parliamentarians present proposed laws.

Contrary to the model of legislation adopted by the Brazilian people, there was a merger of two bills, the first by Deputy Jobim in the first part and the second part by Deputy Michel Temer Project, the substitute was approved and the final text sanctioned by the President of the Republic with a single veto, becoming Law 9099 of September 26, 1995.

Thus, the special courts were created to meet a need for qualification of procedural demands, the legislator was concerned with creating a body within the judiciary capable of dealing with causes of less complexity and less economic value, only after the creation of the specific law. , which provides for the special civil and criminal courts was that the bodies began to function in practice.

Before the creation of Law 9.099/95, the courts already existed in the Federal Constitution, the constitutional basis is the Constitution of 1988, prior to the Law that disciplines the institutes.

3.2 CONCEPT OF SPECIAL CIVIL COURT

Courts can be understood as bodies that make up the judiciary, competent to process and judge cases of lesser complexity and lesser economic value.

In addition to Law no. 9,099/95 Laws of Courts, are based on the Federal Constitution of 1988, in (art. 98, item I); on the fundamental principles (arts . 2nd, 5th and 13th of the CF); (Article 1, sole paragraph, of Law No. 12,153/09).

It is possible to understand how an organ of ordinary justice, inserted in the judiciary, the courts were created from a series of principles that helped by the doctrine seek the conciliation, processing and judgment of actions considered simple and of lesser economic value.

Numerous cases are processed by the Brazilian judiciary, the courts have the competence to prosecute cases of lesser economic value based on the principle of simplicity of procedural demands, the legislator understood that the creation of a body capable of organizing the simplest cases, would help with the end of judicial delays, imagine waiting years to solve a problem with the telephone operator for undue charges, with this in mind, this institute was created that allows access to justice quickly and almost for free.

The special courts play a very important role both for the jurisdiction and for the operators of the law, an essential body for the best application of the jurisdiction, based on the constitutional principle essential for the better development of the process and acting in specific causes has been a great help. in the search for the effectiveness of justice.

It is noteworthy that one of the primary goals of CPC/15 is to reduce the number and duration of proceedings. For this, the consensual solution of disputes through conciliation and mediation is encouraged.

The Constitution of Brazil defines the fundamental rights and guarantees that are scattered in the constitutional text, such as free access to justice, guaranteeing to all, the reasonable duration of the process and the means that ensure the speed of its processing, according to the Article 5, LXXVIII. In this way, the Federal Constitution defines the pillars that underlie the relations between allied citizens under the republican and democratic aegis. Provide still, right, but also determine duties. The contradiction between obeying the rules, exercising their provisions and having their rights guaranteed sometimes slips into the need to show the conflict to the State-Judge, which has the prerogative of being the holder of the public function of mediation and conflict resolution, based on in the law and normative order in force.

Alternative means of conflict resolution are treatment techniques that seek to use dialogue as the main form of dispute resolution. This form intends to resolve the dispute in a more peaceful way, where the parties, who make up the conflict, would be helped by an impartial third party, in the search for the resolution of the problem.

4 DUTY TO REASON LEGAL DECISIONS

With the entry into force of the New Code of Civil Procedure, Law nº 13.105/15, many speculations began to arise in relation to the grounds for judicial decisions. It is important to note that before the entry into force of the Federal Constitution and other provisions that regulate the rules of Brazilian Procedural Law, there was already a need for reasoning (DONIZETTI, 2016).

Before the creation of statutes and codes that govern the rules of law in society, there was already a need to justify the rules, so that societies could be sure that the law was being complied with effectively and fairly.

What is exposed by the article demonstrates the judge's duty to justify the decision more precisely. It is imposed on the magistrate to express the reasons for the sentence according to what was produced in the process, followed by legal justification.

Changes in the legal sphere constitute a link between all branches of law and constitutional norms, so we must understand the duty of reasoning as a minimum constitutional guarantee, capable of preserving the correct application of due process of law.

In addition to requiring the motivation of judicial decisions, it has a dual function, and can be conceptualized as endo -procedural and extra-procedural. In this way, the Endoprocedural function has its

actions within the process, and the Exoprocedural or Extraprocedural is the one practiced by the people, as an exercise of control (DIDIER JUNIOR, 2017).

4.1 BASIS OF JUDICIAL DECISIONS IN THE CIVIL PROCEDURE CODE OF 1973

The decision is a genus whose procedure involves several species. It is a set of acts performed by the judge to resolve the jurisdictional demand, which can be pronounced during the course of the process.

Interlocutory decisions are those given in the course of the process that the magistrate uses to determine or impose something on the disputing parties, they do not enter the merits, and can only serve as an instrument for temporary compliance with a measure established by the magistrate. Dispatches are the acts performed by the judge, ex officio or at the request of the parties, without decision-making content or prejudice to any of the litigants.

Article 458 of CPC/73 deals with the elements that must be contained in the sentence, during the validity of the 1973 code it was one of the main guiding devices of the magistrates when rendering their decisions. The same requested the procedural report of the parties with their personal data, a summary of the records talking about the initial request and contestation and other acts, the legal reasoning of the decision, and the pronouncement of the magistrate.

Great were the innovations of Law n° 13.105/15 in terms of disrespecting the reasoning of judicial decisions, the code presents a new vision of sentence, definitively extinguishing the idea that the sentence is the cause of extinction of the process. Now the sentence is defined as an act of the magistrate, which according to its content may or may not resolve the merits of the case.

The judgments that resolve the merits of the case are provided for in article 487, of CPC/15, the causes that resolve the merits remain the same as the 1973 code, without changes to its content. The sole paragraph was an innovation that requires the hearing of the parties before the recognition of prescription or decay.

The sole paragraph was an innovation that requires the hearing of the parties before the recognition of prescription or decay. The necessary elements for the sentence are provided for in article 489, of CPC/15, it is necessary that the reasoning contains the reasons why the magistrate made the decision, as a way for the parties to base their appeal reasons.

This article deals with the essential elements for the reasoning of the sentence, in the absence of any of these, the sentence will be null. In this article we can see major innovations, such as the motivation of the sentence, the ability to demonstrate that the decision was not created by an event relevant to the process or will of one of the parties, but part of the fulfillment of a legal determination, the motivation is important to demonstrate the creation of the magistrate's reasoning at the time of exposing his pronouncement.

In this way, the main elements mentioned by the article are: the report, the motivation, the reasoning, the legal concepts, and the opinion. It remains clear the judge's duty to draft a sentence in accordance with all points of the process. The new code reaches the concern of the effectiveness of judicial protection, that

is, if the magistrate makes his pronouncement, the parties need to clearly understand the reasons in fact and in law that led him to the aforementioned understanding, not to mention that this is a concern of the superior Courts, to guarantee the quality of the demand extended to the jurisdictions, the judge needs to exercise his role in order to meet satisfactory objectives of goals.

4.2 BASIS OF JUDICIAL DECISIONS IN SPECIAL CIVIL COURTS

Decisions in special courts are made by the lay judge, always at the end of the instruction and judgment hearing. The court system aims at resolving conflicts with agreements, but the parties may not be able to reach a position, requiring that they be heard by the judge who will then issue the decision.

In the court, the sentences are pronounced based on the principle of orality, one of the main guides of the appointed system. In order to meet the aforementioned, the legislator does not impose subsidiary elements of the Code of Civil Procedure.

Thus, it must contain only the procedural elements that the magistrate deems necessary, such as: brief report of the hearing, and the opinion. According to the provisions of the sole paragraph, the sentence will necessarily be liquid, with the values defined, even if the author has formulated a generic request.

Article 52, IV, deals with the subpoena of the sentence, in which it presupposes that the loser will be urged to voluntarily comply with the sentence. Once it has become final and has not been complied with, a written or oral request from the interested party is sufficient to initiate enforcement, regardless of a new citation.

5 IMPETRATION OF WORDS OF SECURITY IN SPECIAL COURTS

The writ of mandamus is provided for in article 5, item LXIX, of the Federal Constitution, and is governed by Law No. 12,016/2009. It is intended to protect a clear and certain right, offended by illegality or abuse of power practiced by a public authority or agent of a legal entity in the exercise of Public Power attributions. Its subsidiarity is highlighted, since it can only be used in cases where habeas corpus or habeas data does not apply.

According to Theodoro Júnior (2019), the conditions of the action are usually sufficiently verified by examining the allegations made in the initial petition. However, such conditions must be maintained and analyzed throughout the process, as they are subject to change. In that case, the judge must evaluate such modifications based on the existing evidence in the case. With this, it is important to note that the fact that the conditions of the action are analyzed in an intermediate or final moment of the process, does not transform them (the conditions) into merit. We continue to deal with conditions of action. Thus, it is wrong to say that the conditions of the action cannot be evaluated based on the evidence in the case, given that the rejection of the claim for non-compliance with an instrumental requirement does not result in a solution on the merits of the case.

After 2009, the STF softened the decision regarding the applicability of a Writ of Mandamus in the courts, with the interpretation of theme 159 of general repercussion, stating that it is up to the Court of Appeal to process and judge a writ of mandamus against a decision of a judge of a Special Court, admitting indirectly that it is possible to issue a writ of mandamus against an act of a court judge.

It is necessary to point out that such a statement does not mean that any type of decision fits against any type of decision just because it is unappealable, and if the writ of mandamus is applicable, it will be filed before the Court of Appeal.

The situations that admit the writ of mandamus in the courts will only be when teratological or manifestly illegal decisions. And in cases where the denying decision belongs to the Appeals Panel, there is no ordinary appeal, but an extraordinary appeal to the STF.

Noting also that the STF itself has already decided that it is not up to it to say when there is or is not a liquid and certain right, according to the judgment of theme 318 of general repercussion, deciding that reviewing the existence of a liquid and certain right is not a constitutional issue, but an infraconstitutional one.

The STJ also defined that the writ of mandamus of the decision of the judge of the Court or of the Appeals Panel always goes to the Appeals Panel, except when the writ of mandamus is discussing competence, then it may be filed with the TJ or TRF, having resolved the competence, the case goes to the court or to the common judge.

6 CONCLUSION

The subject, although very controversial, already has a position of the Federal Supreme Court and the Superior Court of Justice, and has already been addressed at the meeting of magistrates by the National Forum of Special Courts - FONAJE. However, it is possible to affirm that the STF softened the decision regarding the appropriateness of a Writ of Mandamus in the courts only after the interpretation of theme 159, admitting the filing of a writ of mandamus only before the Court of Appeal in the face of teratological or manifestly illegal decisions.


Regarding the reasoning of judicial decisions resulting from constitutional provision (art. 93, IX, CF). The Civil Procedure code is applied only subsidiarily to the microsystem of the courts, since it has Law 9.099/95 as its governing law.

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CHAPTER 72

Microbiological analysis of water for human consumption of the population of the Pachapiriana population center, chontalí district, jaén province – 2019

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ABSTRACT

The present research work called "Microbiological analysis of water for human consumption of the population of the Pachapiriana Populated Center, District of Chontalí, Province of Jaén - 2019" whose objective was to determine the level of microbiological contamination of the water for human consumption in the Populated Center Pachapiriana,

District of Chontalí, Province of Jaén - 2019, of 120 homes, 40 homes and 4 water supply wells were considered for the study. In the investigation we worked with the Most Probable Number Technique in which we obtained results that the samples have to be $< 1.8/100$ ml; while the results obtained are $> 6.8/100$ ml high for total coliforms, for fecal coliforms it resulted in $> 4/100$ ml and for E. Coli; If three samples were obtained (9 – 18 and 31) with the indicated value of DS N° 031-2010, which is $< 1.8/100$ ml, the remaining 37 samples have the presence of E. coli because the result is $> 2/100$ ml It is concluded that, based on the presumptive, confirmatory and complete tests carried out, it was determined that the water supplied to CP Pachapiriana does not meet the microbiological conditions to be considered fit for human consumption because all the samples have an MPN significant number of fecal, total coliforms and E. coli which indicates that the water is contaminated with fecal matter.

Keywords: Water pollution, fecal coliforms, total coliforms, harmless

1 INTRODUCTION

The World Health Organization (WHO), in its 2004 guidelines for the quality of drinking water, points out that the most common and widespread risk that drinking water carries with it are infectious diseases caused by bacteria, viruses, protozoa and helminths. (1)

Globally, about 1.8 million people die each year from diarrheal diseases (including cholera); 90% of these people are children under the age of five, mainly from developing countries. In addition, it has been estimated that 88% of diarrheal diseases are caused by unsafe water supply, sanitation and poor hygiene.(2)

In 2013 in Peru, (3)Domínguez et al (3) identified more than 20 diseases in which water is a direct or indirect vehicle for contagion, some of which have a high impact in terms of morbidity and mortality, due to contamination with sewage and human or animal excreta; indicating at the same time that the population that lives in human settlements does not have adequate sanitary conditions, nor access to quality water and is calculated at 40.6%.

Gutiérrez Feliciano (4), indicated that in Puno the population still consumes water contaminated with fecal matter; and it is that there are only about 49 thousand 900 home connections in the drinking water system, according to the Drinking Water and Sewerage Service Provider Company (SEDA-Juliaca). In other words, around 50% of the population does not have this vital service, which is why they consume contaminated water from wells.

The procedure by which water is inspected is microbiological analysis, which determines whether or not it has pathogens and, if positive, its load (quantity) and degree of pathogenicity. Microbiological analyzes are usually based on the cultivation and counting of microorganisms. (5)

The management of the quality of water for human consumption guarantees its innocuousness and is governed specifically by the following guidelines; prevention of diseases transmitted through the consumption of water of doubtful or poor quality. Development of promotion, education and training actions to ensure that the supply, monitoring and control of the quality of water for consumption are efficient, effective and (6).

The control of the sanitary quality of environmental resources can be carried out through the enumeration of bacteria that indicate fecal contamination. These bacteria can be used to assess the quality of food, sediments and water intended for human consumption, agriculture, industry and recreation, since there is no universal indicator, so the most appropriate for the situation must be selected. study specific. The most widely used faecal contamination indicators are total and thermotolerant coliforms, *Escherichia coli* and enterococci.(7)

Total coliforms are Gram-negative rod-shaped bacteria that ferment lactose at a temperature of 35 to 37 oC, producing acid and gas (CO₂) in 24 hours, aerobes or facultative anaerobes, are oxidase negative, do not form spores and have enzymatic activity of the B-galactosidase. Among them are the different *Escherichia coli*, *Citrobacter*, *Enterobacter* and *Klebsiella*.(8)

Klebsiella aerogenes are Gram-negative bacteria, facultative anaerobes, of the Enterobacteria family, many are pathogenic and cause opportunistic infections in compromised hosts, generally hospitalized, causing urinary tract and respiratory tract infection. (9)It is found in the human digestive tract, but also freely in soil and water; their colonies are large and mucous, some strains form a capsule, they can use glucose and lactose as a carbon source, they do not form hydrogen sulfate. (10)

Thermotolerant coliforms, withstand temperatures up to 45 oC, comprise a very small group of microorganisms which are quality indicators, since they are of fecal origin. They are mostly represented by the microorganism *E.coli* but, among others less frequent, *Citrobacter freundii* and *Klebsiella pneumoniae* can be found. The latter are part of the thermotolerant coliforms, but their origin is normally associated with surveillance and they only occasionally appear in the intestine (11).

E. coli is the only species within the Enterobacteriaceae that presents the enzyme B - DGlucuronidase , which degrades the substrate 4-methylumbelliferyl-β-D-glucuronic acid (MUG),

forming 4-methylumbelliferone, this product has the priority of emitting blue fluorescence /green when illuminated with ultraviolet light. (12)

There are pathogenic indicators of fecal-oral transmission which may be present in raw water (natural water that has not been subjected to treatment processes for its purification), including bacteria such as *Salmonella* spp. , *Shigella* spp., total and fecal coliforms, which have been found in water supplies (13).

The regulation of the quality of human consumption (DS N° 031-2010-SA), through its 10 titles, 81 articles, 12 complementary, transit and final provisions and 5 annexes; It not only establishes maximum permissible limits, in terms of microbiological, parasitological, organoleptic, chemical, organic and inorganic parameters and radioactive parameters, it assigns new and greater responsibilities to the Regional Governments, regarding the surveillance of the quality of water for human consumption. ; in addition to strengthening the DIGESA, in its position as a health authority regarding these issues. This regulation establishes general provisions in relation to the management of the quality of water for human consumption, in order to guarantee its safety, prevent health risk factors, as well as protect and promote the health and well-being of the population; Likewise, they indicate the microbiological parameters and other organisms(14)

As National background, Sotomayor Cobos was studied (15); In his research carried out in Ecuador, where he obtained 38 monthly samples for 4 months, the results obtained total coliforms were 1800 NMP/100ml, the maximum permissible being <2 NMP/100ml. In *E. coli*, 700 MPN/100ml was found, the maximum permissible being <1 MPN/100ml. Yeast and mold count. As we do not have an established standard for yeasts, we cannot determine if the microorganism count meets quality standards. In conclusion, it is said that some samples with high concentrations show the need to take some measures from different areas.

Chong Rengifo (16), in his research carried out in Peru in 12 samples (6 samples from artisanal wells and 6 from reservoirs), as results, heterotrophic bacteria were obtained, the maximum value found was 1300 CFU/ml. In total coliforms, 1.6×10^5 NMP/100ml was found. thermotolerant coliforms 5.4×10^4 NMP/100ml; announcing that the well water and the waters of the distribution network of the La Libertad Minor Population Center are contaminated with fecal coliforms.

Chambi Choque (17), in his study of the Water for Human Consumption of the Populated Center of Trapiche- Ananea - Puno, considered 54 samples of water distributed in 10 pools, 20 ditches and 24 artisanal wells, obtaining numbers of contaminated and non-contaminated supply sources; the same ones that were analyzed through the chi-square statistical test, and the NMP of coliforms and *Escherichia coli* , obtaining higher contamination results in the pools 70%, wells 54% and ditches 40%; being the most likely number of *Escherichia coli* higher in wells 11.46 ± 3.36 compared to ditches and pools that had 7.75 ± 2.43 and 6.28 ± 2.21 MPN of *Escherichia coli* , respectively ($P \leq 0.05$); determining that the three water supply sources are NOT SUITABLE for human consumption.

According to everything mentioned above, it is necessary to carry out a study that will indicate the microbiological quality of the water in the catchment wells and the homes of the residents of the Pachapiriana Populated Center, Chontali District, because there is the possibility that is contaminated with coliform bacteria, due to the state of its wells and the color of the water that reaches the houses, establishing the following problem to investigate: What is the level of microbiological contamination of the water for human consumption in the Populated Center Pachapiriana – 2019?

The main beneficiaries of this research will be for the workers of the water plant and the consuming population, since it will help to determine the presence of coliform bacteria, which is the main objective. However, as noted above, wastewater quality guidelines and reuse standards are often expressed in terms of the maximum allowable number of total coliform bacteria. Since there is no doubt about the faecal origin of the wastewater, it is assumed that these microorganisms can be used as indicators of pathogenicity and that there is at least a semi-quantitative relationship between the concentrations of pathogenic and indicator microorganisms.

2 MATERIALS AND METHODS

2.1 KIND OF INVESTIGATION

The present study is descriptive, because it fundamentally characterizes specific phenomena or situations indicating their most peculiar or differentiating features.

2.2 POPULATION

The study population is made up of 100 homes that consume piped water that use it for different purposes, the homes that served for study belong to the Pachapiriana Populated Center, and is located in the District of Chontalí.

2.3 SAMPLE

The study of the samples was carried out in a systematic random manner where 1 out of every 2 samples arrived at the laboratory was chosen.

3 METHODS, TECHNIQUES, INSTRUMENTS AND PROCEDURES FOR DATA COLLECTION.

According to the "Protocol of procedures for the taking of samples, preservation, conservation, transport, storage and reception of water for human consumption" - RD September 24, 2015 - MINSA.(21)

Sampling procedure

Location and sampling points

The location and number of samples to be taken must be programmed.

fixed points

- in the uptake
- At the outlet of the water treatment
- At the exit of the storage infrastructure

Points of collective interest

- In sectorized distribution networks

Sampling

- The sampling was carried out by personnel authorized for the activity, in order to ensure that the samples are representative of the water.
- The sampling point must be identified.
- Take into account: that when taking samples from the faucets, it must be taken into account that there is no leak from the seals and gaskets of the pipe, remove any device foreign to the faucet, then we proceed to disinfect the faucet internally and externally prior to the sampling with cotton or hyposo with alcohol at 70% after opening the faucet and letting it flow for 2 minutes before taking the sample; and to take the sample in the wells, a nylon sampling cord must be secured by means of the fastener located at one end and submerged 30 cm, taking care that it does not rub against the walls of the structure and withdraw.

Labeling and identification of water samples

The bottles must be identified before taking the sample with a label, written in clear and legible handwriting, preferably using indelible ink, without erasures or amendments, which must be protected with transparent adhesive tape containing the following information precisely:

- Field identification code
- Town, district, province, region
- Sampling point
- Matrix
- Sampling date and time
- sampler

Storage and shipment of samples

- The samples that we collected were kept in thermal boxes (coolers) at temperatures of 4 °C (but not frozen).

- The glass containers were carefully packed to avoid breakage, spills and contamination; we move in thermal boxes, isolated from the influence of light solar and with availability of space for the placement of the cooling material.

Data Collection Techniques

1. Surveys were conducted to verify their opinion about the water provided for their consumption.
2. Field stage: In this stage of the investigation, 44 water samples were collected in sterile glass containers with a lid of 250 ml capacity, a volume of 150 ml according to the selected sampling points, using for a better identification of the samples taken the data record sheet. It will be transported in refrigerated conditions to be analyzed later.
3. Laboratory stage: In this stage of the investigation, the bacteriological analysis of the water samples was carried out through the Most Probable Number (NMP) method, the analysis will be carried out in the laboratory of the Morro Solar Health Center - Jaén; microbiology area.

4 RESULTS

a. The sample of the catchment area is 79/100 ml of contamination by total coliforms, 9.3/100 ml of fecal coliforms, because it is not covered; In addition, it is located in an area where there are plants. The sample from the sedimentation zone found 49/100 ml of contamination by total coliforms, 6.8/100 ml of fecal coliforms, since they do not have adequate cleaning and disinfection. The sample from the reservoir area with 27/100 ml of contamination by total coliforms, 6.8/100 ml of fecal coliforms , since the reservoirs do not have a fixed lid and are exposed to the elements that allow dust, garbage to enter. ; and, the sample taken in the supply well for the houses with 49 /100 ml of total coliform contamination, 9.3 /100 ml of fecal coliforms, this reservoir is at an average height but does not have a lid that covers people do not introduce contaminating material, the samples do not exceed the maximum permissible limits of the Regulation on the quality of water for human consumption.

b.

	Sample of wells	TOTAL COLIFORMS			MOST LIKELY NUMBER		
		Confirmatory Test			100g	MPN	
		10	1	0.1	100ml	Post* 100ml	
A= catchment area	A	5	3	0	79	530	79
B= Settling chamber	B.	5	two	0	49	520	49
C= Filtration chamber	C	4	3	0	27	430	27
D= Reservoir	D	5	two	0	49	520	49

Sample of wells	FECAL COLIFORMS				MOST LIKELY NUMBER		
	Confirmatory Test		MPN	MPN	100g	MPN	
	10	1	0.1	100ml	Post* 10;1;0.1	100ml	
A= catchment area							
B= Settling chamber							
C= Filtration chamber	A	two	two	0	9.3	220	9.3
D= Reservoir	B.	two	1	0	6.8	210	6.8
	C	two	1	0	6.8	210	6.8
	D	two	two	0	9.3	220	9.3

c. Table 2 presents the evaluation of the quality of water according to the processing of data from the surveys carried out on each head of family of the 40 homes, which indicated that the water they consume is not of good quality, determining in the averages of their answers that 100% are located in the "bad" category, this indicates that the water of the Pachapiriana Populated Center is not treated correctly.

Category	Frequency	
	Quantity	Percentage
Bad	40	100.00%
Good	0	0.00%
Excellent	0	0.00%
Total	40	100.00%

d. Table 3 shows that of the 40 samples, 2 have the highest MPN: sample 10, in which 350/100 ml of total coliforms were found, and sample 9, with 220/100 ml of total coliforms, homes are located at a distance of 3 meters from the distribution well. The other samples taken and processed also do not comply with the maximum permissible limits, according to the regulations on the quality of water for human consumption. (Supreme Decree No. 031-2010-SA).

Total coliforms		fecal coliforms	Maximum allowable limit
MPN	Number of houses	Number of houses	
2 - 12	16	30	< 1.8/ 100 ml
13 - 23	14	10	< 1.8/ 100 ml
24 - 34	7	0	< 1.8/ 100 ml
35 - 45	1	0	< 1.8/ 100 ml
220	1	0	< 1.8/ 100 ml

350	1	0	< 1.8/ 100 ml
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e. Table 4 shows the 40 samples taken from the homes of CP Pachapiriana, where the results were positive for total coliforms, fecal coliforms and *Escherichia coli*, since they exceeded the established limit, which is <1.8/100 ml. MPN this means that they do not comply with the maximum permissible limits, according to the regulation of quality of water for human consumption. (Supreme Decree No. 031-2010-SA)

MPN	Total coliforms Number of houses	fecal coliforms Number of houses	Escherichia coli of houses	Maximum allowable limit
< 1.8	0	0	3	< 1.8/ 100 ml
2 – 12	16	30	35	< 1.8/ 100 ml
13 – 23	14	10	2	< 1.8/ 100 ml
24 – 34	7	0	0	< 1.8/ 100 ml
35 – 45	1	0	0	< 1.8/ 100 ml
220	1	0	0	< 1.8/ 100 ml
350	1	0	0	< 1.8/ 100ml

f. Table 5 shows the results of the 4 samples taken from the water supply wells at CP Pachapiriana, where it can be seen that they do not meet the established limit <1.8/100 ml. MPN this means that the samples are positive for total, fecal and *E. coli coliforms*; not complying with the maximum permissible limits, according to the regulation of quality of water for human consumption. (Supreme Decree No. 031-2010-SA)

Sample of Wells	Total coliforms	fecal coliforms	Escherichia coli	Maximum allowable limit
	MPN	MPN	MPN	
A	79	9.3	2.0	< 1.8/ 100 ml
B	49	6.8	4.0	< 1.8/ 100 ml
C	27	6.8	4.0	< 1.8/ 100 ml
D	49	9.3	4.0	< 1.8/ 100 ml

5 DISCUSSION

According to the processed samples of the 4 wells, the result indicates that they are contaminated, as shown in table 01, where it can be seen that the contamination catchment area is 79/100 ml of total

coliforms, 9.3/ 100 ml of fecal coliforms; being a possible contamination factor the abandonment in which it is found, the remains of plants inside, high concentration of green freshwater algae. The sample taken in the sedimentation area, resulted in 49/100 ml of contamination by total coliforms, 6.8/100 ml of fecal coliforms, a possible effect being the lack of adequate cleaning and disinfection. The sample taken in the filtration area yielded the result of 27/100 ml of contamination by total coliforms, 6.8/100 ml of fecal coliforms , being a possible source of infection that the well is exposed to the elements of dust, trash, and other debris; and, the sample taken in the reservoir, resulted in 49 /100 ml of total coliform contamination, 9.3 /100 ml of fecal coliform, being a possible factor that the well does not have coverage that protects it from contaminating effects, for which it resulted that the 04 samples taken in the water supply wells of the Pachapiriana Populated Center do not exceed the maximum permissible limits of the Regulation of the quality of water for Human Consumption; results that are similar to the study carried out by Chong (16) where he indicates that the well water and the water from the distribution network of the La Libertad Minor Population Center contained samples contaminated with total coliforms 1.6×10^5 NMP/100ml; thermotolerant coliforms 5.4×10^4 NMP/100ml; as well as what was determined by Sotomayor(15) because 38 monthly samples were obtained for 4 months, as a result total coliforms were obtained 1800 NMP/100ml being the maximum permissible <2 NMP/100ml. In *E. coli* , 700 MPN/100ml was found, the maximum permissible being <1 MPN/100ml.

Regarding the evaluation of the quality of water according to the data processing of the survey carried out on each head of the family of the 40 houses, it indicates that the category "bad" has a percentage of 100%, this indicates that the water of the Center Poblado Pachapiriana is not treated correctly; results that are identical with the study conducted by Chong (16) where it indicates that human health is one of the main concerns of man, given the negative consequences of its neglect; in this context is that societies as a whole add capacities to monitor the quality of water sources for human consumption, managing, on many occasions, to reverse counterproductive consequences in a timely manner, through precise actions that entailed enormous efforts. human and economic. However, there are places where this health is not a priority, as is often the case in communities far from urban areas.

From the results obtained in the tests carried out on the 40 samples taken in the houses, it can be indicated that none of them complies with the maximum permissible limits of the water quality regulation for human consumption, the most outstanding results being sample 9, which has 220/ 100 ml and sample 10 with 350/100 ml for total coliforms; and, for fecal coliforms, samples 10 and 12 resulted in a MPN of 21/100 ml, houses that are located at a distance close to the distribution well. These results are similar to the study carried out by Chambi (17), who considered in his study 54 water samples that were obtained from 10 pools, 20 ditches and 24 artisanal wells, resulting in greater contamination in the pools 70%, wells 54% and ditches 40. %, determining that the three water supply sources *are not suitable* for human consumption; In addition, it was determined in the evaluation of the sanitary state of the water supply infrastructure, they are deteriorated due to the fact that maintenance is not scheduled for the

infrastructure, as happens in the water supply infrastructure system, which is the reason for the present investigation.

It was also possible to determine that the samples of the houses and the wells do not comply with the maximum permissible limits for total coliforms, fecal coliforms and *Escherichia coli* established in the Regulation of the Quality of Water for human consumption (DS N° 031-2010- SA); data that are similar to the study carried out by Sotomayor (15) where he obtained results higher than the maximum permissible limit for total coliforms and for *E. coli*, evidencing the need to take immediate measures; There is also a similarity with the study carried out by Chambi Choque (17) where it was determined that the processed samples were contaminated and exceeded the Most Probable Number of coliforms and *Escherichia coli*, considering the water supply as unfit for human consumption.

Regarding the objective and the hypothesis raised in the investigation, it was determined that the level of contamination of the water for human consumption does not meet the parameters, the 44 samples worked had an incidence greater than 1.8/100 ml. This indicates that the results obtained in the distribution network and in the houses are contaminated because the maximum permissible limit does not comply with the Regulation of the quality of water for human consumption (DS N° 031-2010-SA), being the causes more importantly, the lack of maintenance and that they do not contain a lid, which is why it is exposed to environmental contamination.

6 CONCLUSION

1. Based on the presumptive, confirmatory and complete tests carried out, it was determined that the water supplied to CP Pachapiriana does not meet the microbiological conditions to be considered fit for human consumption because all the samples present an important MPN of fecal coliforms, total and *E. coli*.
2. According to the applied survey, it was concluded that the quality of water consumed by the population is not adequate according to the data processing carried out on each head of family of the 40 homes.
3. From the evaluation carried out on the samples taken in the 40 houses, it was determined that there is contamination in all of them for total coliforms and for fecal coliforms; while for *E. coli* 37 samples were higher than what is allowed by Supreme Decree No. 031-2010 SA.
4. According to the NMP technique, 100% of household water samples are not suitable for human consumption, according to Supreme Decree No. 031-2010, which indicates that the samples must be < 1.8/100 ml; while the results obtained are > 6.8/100 ml high for total coliforms, while for fecal coliforms it resulted in > 4/100 ml and for *E. coli*; if three samples were obtained (9 – 18 and 31) with the indicated value of DS N° 031-2010 which is < 1.8/100 ml, the remaining 37 samples have the presence of *E. coli* because the result is > 2/ 100ml

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CHAPTER 73

Role of multi-professional teams in case of elderly victims of violence

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ABSTRACT

Violence against the elderly occurs often, mainly by family members, becoming a major problem in the health area and requiring special attention. The present study aims to identify the joint care provided by health professionals in situations of violence against the elderly. It is an integrative literature review with a qualitative approach. The search period took place in May 2022. A search for articles was carried out in the Scientific Electronic Library Online (SCIELO) databases, academic google, and what is present in the statute of the elderly. Using the Descriptors in Health Sciences (DeCS) and Boolean Operators in the respective sequence "Elderly AND Violence AND Health teams". Eligibility criteria were used to better obtain articles that addressed the topic of interest. After that, a reading of the title and objective of the studies was carried out. After applying the inclusion and exclusion criteria, 76 articles remained that were analyzed. Of these, 62 were excluded because they did not fit the focus of the research, leaving 14 articles. The studies showed that the professionals who make up the multidisciplinary health teams are essential in the identification of cases of violence, as they are close to the patients and, despite the encountered difficulties, they can intervene in the fight against these cases, contributing to the return of these people's quality of life.

Keywords: Elderly; Health; Violence

1 INTRODUCTION

The World Health Organization (WHO) establishes violence against the elderly as any action or omission that causes harm or suffering to people 60 years and older. With aging, and the emergence of comorbidities, the elderly are in a phase of vulnerability, added to the prejudice experienced resulting in

a high occurrence of violence (Silva *et al.*, 2018).

The act of violence against the elderly covers physical, sexual, psychological, economic and even patrimonial abuse. Also observing that financial abuses are usually accompanied by ill-treatment, generating wounds, traumas and some cases of death (Santos *et al.*, 2019). These types of violence cause suffering and serious harm to these individuals, such as feelings of fear and insecurity, trauma and pain that impact their health and quality of life (Silva *et al.*, 2018).

This situation is common in several homes, but ends up being hidden and denied by the victim himself, in an attempt to justify and defend the situation, for fear of harming the life of the person who mistreats him, the child, grandson or caregiver, or for fear that it will become more recurrent, that he suffers some kind of punishment. Thus, the professional presents an important role of identifying and reporting suspected or confirmed cases of violence against the elderly (Oliveira *et al.*, 2018).

The health professional is fundamental to pay to the signs of violence, for greater contact with patients, for the performance of home visits, and for the creation of bonds with patients. Therefore, it is necessary to address challenges such as this since graduation, understanding the vulnerability that has been accompanied with age and all the impact experienced by this elderly (Moreira *et al.*, 2018).

Among the signs that the professional can identify as early as possible, one should pay close eye to hematomas, reports of pain, lacerations, depression, abrasions, injuries, fractures, behavior problems (very introverted, frightened or very aggressive) and burns. After confirmation, actions should be carried out to solve the problem, by validated instruments and adequate listening (Rodrigues *et al.*, 2017).

These cases require special attention, so professionals must work together, in a multidisciplinary way and with the legal sphere. With this arose the following guide question: What is the role of multidisciplinary health teams in the care of elderly people submitted to violence?

Evidencing this, the present study aims to identify the joint care performed by health professionals in situations of violence against the elderly.

2 METHODOLOGY

This study is an integrative review of the literature with a qualitative approach. The type of literature review study is performed through a search in other databases that help in achieving the intended objective by expanding knowledge about certain topics. With this it is possible to know by literature found what information already exists about what is being researched (de Sousa *et al.*, 2021).

The integrative review allows the integration of various types of methodology making room for obtaining results in a systematized and organized way. The search for information through the integrative method contributes to a deepening on the theme allowing a broad look at the objective to be achieved (Souza *et al.*, 2010).

The search period occurred in May 2022. Where an article search was performed in the Scientific Electronic Library Online (SCIELO) databases, google scholar and what is present in the statute of the

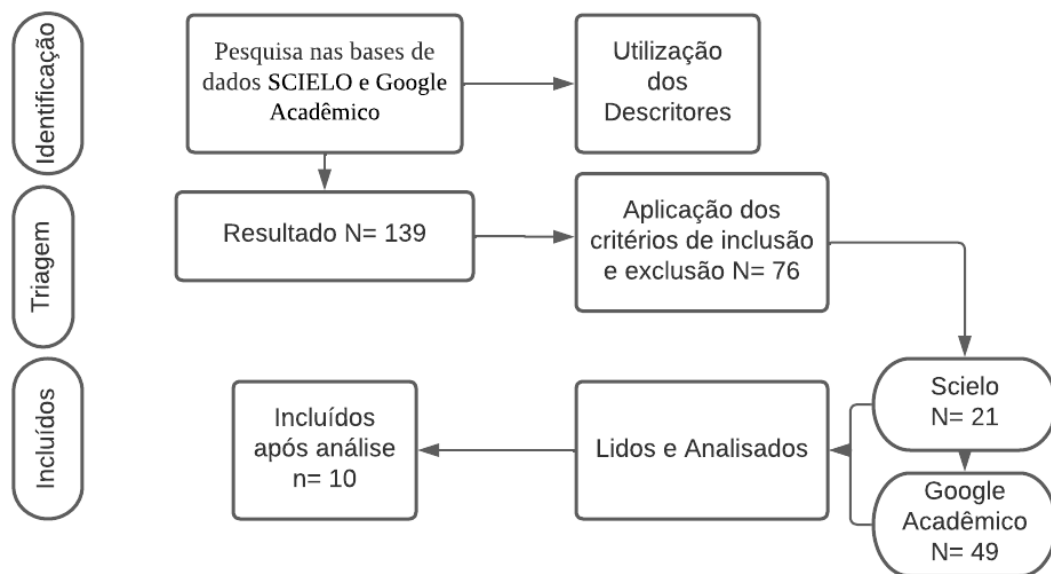
elderly. Using the Descriptors in Health Sciences (DeCS) and Boleyn Operators in their sequence " *Elderly AND Violence AND Health Teams*". The inclusion criteria were: being available in full, studies in Portuguese and English with access to translation, and had been published in the years 2018 to 2022 and those that shows relevance to the intended objective. The exclusion criteria were given to duplicate articles and non-original articles, as well as theses, dissertations and monographs. Next, the titles and the objective of the studies were read.

3 RESULTS AND DISCUSSION

The descriptors mentioned were obtained, a total of 139 documents were obtained. After applying the inclusion and exclusion criteria already mentioned, 76 articles were analyzed. Of these, 66 excluded for not s and relate to the elderly theme or violence against the elderly, leaving 10 articles for the preparation of the article. For better understanding, figure 1 shows a flowchart with the stages of collection of the articles.

Figure 1: Step-by-step flowchart of the findings
Included – Sorting – Identification

Research on Academic Google and SCIELO database – utilization of descriptors – result N=139 – application of inclusion and exclusion criteria N=76 – Scielo N=21 – Academic Google N=49 – read and analyzed – included by analysis N= 10



Source: Own, 2022.

Table 1 is the articles used being organized by the author's name and year of publication, title of the work and objective. The preparation of the table aims to organize the findings to facilitate understanding.

Chart 1: Sample of findings

Author/Year	Title	Goal
Alarcon, M. F. S et al. 2021.	Violence against the healthy person: perceptions of primary health care teams	Understand how professionals working in primary care teams perceive violence against the elderly.
Alarcon, M. F. S et al. 2021.	Violence against the elderly: actions and suggestions of primary health care professionals.	To analyze the actions and suggestions of primary care professionals in relation to the abuse of the elderly.
Barreto, A. M. M. A et al, 2020.	The conception of health professionals about violence against the elderly: an integrative review.	Identify scientific evidence on the conceptions of health professionals about violence against the elderly
Barros, R. L. D. M et al, 2019.	Domestic violence against the elderly assisted in primary care.	To investigate the prevalence of domestic violence against the elderly assisted in primary care and possible associated factors.
Lino, V. T. S. et al, 2019.	Prevalence and factors associated with the abuse of caregivers against dependent elderly: the hidden face of family violence.	to verify the prevalence of evidence of violence against dependent elderly dependents by family caregivers and the factors associated with abuse in a poor region of the city of Rio de Janeiro.
Alarcon, M. F. S et al. 2021.	Violence against the elderly: actions and suggestions of primary health care professionals.	To analyze the actions and suggestions of primary care professionals in relation to elder abuse.
Paula, C. A. de, & Martins, P. F. de M. 2018.	Aging in palms: the compulsory notification form of violence as a relevant instrument to combat violence against the old.	Report the situation of violence faced by the elderly population in the city of Palmas.
Azevedo, C. O., & da Silva, T. A. S. M. 2019.	Nursing care to detect violence against the elderly.	To verify the conducts adopted by the nurse professional when identifying situations of violence and ill-treatment against the elderly.
Silva, R. M. D., et al, 2021.	Challenges and possibilities of health professionals in the care of dependent elderly.	It investigates challenges and possibilities of health professionals for the management of care for dependent elderly in Primary Health Care.
dos Santos, L. C. A. et al, 2022.	Physical violence against the elderly: nurses as the protagonist of detection in the hospital environment.	To identify the knowledge of nurses in relation to the signs and symptoms of violence in the elderly, in the hospital environment.

Source: Own, 2022.

3.1 FACTORS ASSOCIATED WITH VIOLENCE AGAINST THE ELDERLY

According to Barreto *et al* (2020), aging factors such as the fragility of people in this age group and the presence of diseases lead the elderly to need greater care, usually done by family members or caregivers. Many end up totally depending on these people and end up losing their autonomy and decisions and this scenario ends up making them susceptible to violence.

Barros *et al* (2019) report that one of the causes that can lead to attitudes of violence is the fact of the vulnerability found in the old people, and these types of situations negatively affect the experience of these people, health and quality of life. He also explains that the divergences of interest between young and old intensify these actions.

There are also morbidities, which lead to decreased functional and cognitive capacity, history of violence relationship, financial dependence and overload, stress and psychopathological disorder

of the caregiver. All this can lead to violence. Other important factors, in this context, are the problems arising from changes in the contemporary family, such as fewer children, women's insertion in the labor market, divorces, among others (Barros *et al.*, 2019, p.794).

The study by Barros *et al* (2019) showed that violence occurs more frequently in married women, who had high dependence on their partners or family, where the most commonly found was psychological violence and physical violence, where cases of aggression are at high rates in hospital admissions.

Most occurrences of acts of violence are of domestic origin, and most come from family and close people. These cases are more complicated to have knowledge, because aggression to elderly people is not expected. The most common types of domestic violence are psychological and physical violence in which the inability of these individuals favors these types of behavior on the part of aggressors (Lino *et al.*, 2019).

3.2 WHAT THE STATUTE OF THE ELDERLY ON VIOLENCE SAYS

The status of the elderly was created to guarantee the right of the elderly to be able to have their dignity preserved. "The guarantee of these rights is determined in the legislation with the advent of the Statute of the Elderly – Law No. 10,741, of October 1, 2003 – considered one of the greatest achievements of the Brazilian elderly population" (Brasil, 2003).

There are several rights present in the law with punishments for those who fail to follow. Some points are focused on violence against the elderly where in Art. 4 of the statute of the elderly (Law No. 10,741) says that "No elderly person will be the object of any kind of negligence, discrimination, violence, cruelty or oppression, and any attack on their rights, by action or omission, will be punished in the form of the law" (Brazil, 2003).

It is necessary that cases of violence are reported to the following bodies described in the law, which are: police authority; Public Prosecutor's Office; Municipal Council of the Elderly; State Council of the Elderly and National Council of the Elderly. Being a mandatory notification. The law also describes that the acts considered to be violence are all those performed in private or public places, or even the omission of the same that can cause damage, physical suffering, mental or cause death in the old person (Brasil, 2003).

3.3 ROLE OF HEALTH TEAMS IN THE FACE OF VIOLENCE AGAINST THE HEALTHY

Alarcon *et al* (2021) explains that primary care teams are essential in the care of elderly victims of violence and that this level of care has a great demand on the part of this population. For him, health teams can intervene in order to make these people aware of their rights. An opportunity to do this is during home visits, because it is possible to observe the situation of these patients and can identify signs that may indicate maltreatment.

Health professionals should take advantage of opportunities to approach the elderly and family members, because, in these moments, they are able to investigate situations of violence that can occur with the elderly who seek health services, such as outpatient clinics, emergency and emergency services and, especially, primary health care (PHC) services. However, many professionals have difficulties to act in this situation, especially for the accomplishment of the complaint, since they suffer threats from the aggressors (Alarcon *et al.*, 2021, p.74).

In some situations it is only possible to know that some elderly people have been suffering some kind of violence when they decide to open up to professionals or even by reports from other people. Teams can act through qualified listening, counseling, notification and referral to the responsible agencies, but performing this conduct by doing everything possible to make the patient comfortable and safe (Alarcon *et al.*, 2021).

To Alarcon *et al.* , 2021, health teams can contribute to the direction of the healthy person performing interventions with family members, this can be done with a broad knowledge of the family and its main difficulties. It is a work that should be done as a team, because it makes it easier to have some result for the patient's well-being.

The identification of a victim of violence often depends on the patients themselves commenting on the subject reporting what happens in their homes, information by health agents or neighbors and acquaintances and/or the identification of signs and symptoms presented by the patient (Paula and Martins, 2018).

It is important that professionals working in health teams are prepared to identify these cases. Some signs may be demonstrations of violence and deserve attention. They are the presence of hematomas, altered or aggressive treatment of family members, caregivers or people close to the conviviality, reports of the elderly or signs of fear, feelings of sadness, anxiety among others that can be observed during consultations (Paula and Martins, 2018).

Azevedo e Silva (2019) points out that the best way to care for the old person who is victims of violence is through welcoming and counseling. The different professionals working on the case should be trained to welcome these individuals in order to make them safe and confident. It is important to know these patients about their rights and professionals can make them have information that is in favor of their case.

4 CONCLUSION

It was possible to conclude that violence against the elderly has become a major problem in the health area and requires special attention from health professionals to reduce and extinguish all physical, mental, and sexual suffering that the patient has been suffering, allowing the creation of bonds and creation of strategies for prevention or identification, encouraging the use of their rights by also reporting cases. It is work that must be done as a team.

In different studies, it was possible to observe that even though I try to know the cases of violence, health teams show fear and often even suffer threats by the aggressor making care even more difficult, and out of fear end up not denouncing or not intervening in situations. It is also visible that the lack of qualification and the lack of support of the different organs in these cases is a barrier to be overcome by health professionals in the care of the elderly victim of violence.

It is necessary for the attention of the agencies

responsible for the creation of public policies that solve the cases of violence against the elderly, as well as the attention of health teams to signs of violence against these patients, and the creation of interventions that help them in these cases.

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CHAPTER 74

Perspectives of the assessment of mathematical learning Case study on memorization of formulas in the test

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ABSTRACT

In this work, we present the discussion on the topic that is often questioned in the classroom: “Make available the pre-established expressions in the

evaluation” that “simplify” the reasoning process at the time of calculation and interpretation, known as mathematical formulas. The objective is to understand what are the positive and negative points of this evaluation methodology. The research was based on a questionnaire applied to mathematics teachers who work at different levels of education.

Keywords: Evaluation. Math. Formulas

1 INTRODUCTION

In teaching mathematics, there are several ways and formulas to solve a given problem. For example, in financial mathematics there are some formulas for calculation such as: amount, future value, present value, simple discount, compound discount, among others. Anyway, learning and “memorizing” all these pre-established mathematical expressions is a challenge. From the experience in teaching, it can be seen that teachers face several questions at the time of the learning verification test, such as “teacher, can I bring the formulas?” or “Professor, what is that formula?”. Dealing with these situations is undoubtedly a challenge for every educator.

According to Luckesi (2011), the assessment of school learning is a very important factor for the development of the individual, and has been the subject of constant research and projects with various treatment approaches. For the evaluation to take place, it is necessary to have some methods to collect the information, which are called evaluative methodologies. Some assessment methodologies are acquired and improved by teachers throughout their experience in teaching.

Some scholars declare that the test is a common assessment tool in the school context. It is used to measure students' memorization ability, often used only to grade or classify students. Thus, in our study, we assume that the test also provides a construction of knowledge, thus, in fact, important for the individual, making the evaluation methodology important for the development of the student.

During conversations with professors, lectures on evaluation and in the experience as a professor, these evaluative methodologies came to play a role in several doubts regarding the chosen method, which motivated investigation into them.

2 RESEARCH OBJECTIVES

The objective of this work is to discuss two pedagogical methodologies used in the evaluation of teaching and learning of mathematics: one if the teacher must have the mathematical formulas at the time of verification of the learning, or the second option, not have them.

According to Hoffmann (2011), the verification process can be done in several different methods. These methods, which can be generally called “teaching and learning assessment methodologies”, are defined according to the objectives of the teacher and student. In this way, we seek to understand and discuss what the teachers' goals are when making formulas available and when they do not.

The verification of learning, in the conception of Moretto (2005), is practiced through a very common instrument in our school routine, the written test. The test in turn, according to Libâneo (2013) is applied only to measure the memory capacity. However, this and other verification instruments are necessary means to search for information on student performance, thus making an assessment of learning.

In view of this, it is necessary, first, to define what assessment is and some important factors, to then define proof and present what the formulas are in the teaching of mathematics to clarify the object of study.

3 LEARNING ASSESSMENT CONCEPTS

Learning assessment, according to Luckesi (2011), began to be known in the mid-1930s. It was first named by Ralph Tyler, who coined this expression to speak of the necessary care that teachers need to take with school learning. Since then, learning assessment has been the subject of research with several different approaches.

According to the National Curriculum Parameters (PCN's 2000) assessment is part of the entire teaching and learning process. It provides a lot of information about student learning such as performance, acquisition of concepts, mastery of mathematical procedures and attitudes.

Thus, it can be said that assessment is important for student learning. This perspective on the importance of evaluation has already been made by authors such as: Moretto (2005), Libâneo (2013) and Piletti (2001), who, in addition, complement the idea saying that it is part of the teaching and learning process that also mentioned by the PCN's (2000) previously.

From Latin, “evaluate” comes from the composition “a- valere ”, according to Luckesi (2011), which means “to value ...”. The concept “evaluation” is formulated from the determinations of conduct in the idea of “attributing” value, which, in itself, implies a positive or negative positioning.

In the school context, learning assessment means, according to Sant'Anna (2001), a continuous process by which it seeks to investigate, measure and analyze changes or alterations in the student's performance, thus confirming whether the construction of knowledge has taken place. Thus, the assessment consists of a verification of the construction of the student's knowledge. Assessment is a continuous process, because each content worked, whether practical or theoretical, has a construction of knowledge.

Bloom (1983) clarifies that assessment is a way of collecting and processing data necessary for the improvement of learning and teaching, it includes a wide variety of information that is far superior to the “final test”. This information serves to clarify important educational goals and objectives in determining the measure of student development.

Therefore, it is understood that there are differences between evaluating and the exams and tests that are better known as proof. Evaluating in education makes sense in obtaining information about students' behavior, while the test only classifies in qualitative and/or quantitative results.

Piletti (2001) and Bloom (1983) understand that assessment is developed at different times, stages and levels of the teaching/learning process. Within this process, there are some typologies/modalities of evaluation, which are the evaluations: diagnostic, formative and summative .

3.1 DIAGNOSTIC EVALUATION

According to Piletti (2001), diagnostic assessment is used at the beginning of the teaching/learning process, in which it is applied at the beginning of a unit, semester or academic year. Sant'Anna (2001) completes that this type of assessment is used by teachers who seek to make an initial diagnosis of the student's knowledge, to start a new content. One of the main points of diagnostic assessment, according to Bloom (1983), is to identify the position of the student's knowledge, so that it can be placed in the most appropriate level of the teaching sequence. Piletti (2001) also emphasizes that this type of assessment aims to verify the knowledge, particularities and prerequisites that the student presents at the beginning of the unit.

Through these definitions, it is observed that the diagnostic evaluation, as the name implies, is an evaluation that verifies if the student is “ready” to start a new teaching unit. It can be verified that the prerequisites of the contents have been fulfilled.

3.2 FORMATIVE ASSESSMENT

Based on Bloom (1983), the formative assessment is worked during the student's training, informs the teacher and, at the same, the results of the teaching/learning process. In this evaluation model, as Sant'Anna (2001) says, the selection of objectives and contents distributed in teaching units must be observed. You must know what you want to evaluate and what the results are for. Establish criteria and efficiency levels to compare results. Specify what you want to evaluate and why it is being evaluated and make decisions to perform the desired action. That is, the actions must be during the process, where they will help the student to develop.

Rabelo (2004) also emphasizes that the “Formative assessment has the purpose of providing information about the development of a teaching and learning process” (RABELO 2004, p. 73) so that the teacher can help him with a pedagogical intervention related to to the deficiencies found in the process.

Formative assessment is an evaluative proposal, in which its focus on teaching and learning, similar to diagnosis, formative assessment provides information to students and teachers. This information, according to Rabelo (2004), can be used by teachers to detect learning difficulties, allowing teachers and students to adjust strategies and devices. These actions aim to quickly correct these strategies, which according to Afonso (2005) this process can mean constant control over students.

In formative assessment, several different methodologies can be applied, including the use and non-use of mathematical formulas in the assessment as stated by Afonso “When teachers practice formative assessment, the collection of information about student learning can be carried out by a plurality of methods and techniques” (AFONSO 2005, p. 38).

However, it is worth noting that this process is not necessarily based on evidence, there may be other assessment tools, as Afonso says.

Formative assessment, often aiming at the achievement of previously defined objectives, is, only in part, a criterial assessment, in the sense that formative assessment can be based on criterial tests although it is not based exclusively on these information collection instruments. (AFONSO 2005, p. 38)

Through this argument, it is understood that formative assessment is a process that aims to improve teaching and learning through an evaluative action, which underlies our research on the use of formulas in the evaluation process.

3.3 SOMATIVE EVALUATION

Summative assessment, according to Sant'Anna (2001), is practiced and consists of classifying students at the end of a unit, according to the levels of achievement presented. This typology of evaluation according to Bloom (1983) is a general assessment of the degree to which the broader objectives were achieved during the entire teaching unit.

In the same direction as the authors Rabelo also defines that:

Summative assessment is usually a one-off assessment, as it usually takes place at the end of a teaching unit, course, cycle or bimester, etc., always trying to determine the degree of mastery of some previously established objectives. It proposes to make a summation balance of one or several sequences of a training work. Sometimes it can be carried out in a cumulative process, when a final balance takes into account several partial balances (RABELO 2004, p. 72).

In other words, summative assessment is an assessment carried out at the end of teaching units in which it aims to provide the final results of various training sequences.

In Bloom's (1983) conception, evaluation in the past was exclusively summative in nature, in which it was applied only at the end of a unit, thus being too late to modify any process. This type of evaluation generally serves, as Rabelo (2004) says, in addition to classifying and informing, it has the function of giving certificates or title to individuals.

Thus, based on the authors' perception, it is understood that summative assessment is a classification process, whose purpose is to evaluate the broad results at the end of a unit. This process will be used for this research, as it is brief and fits into the time available for the research.

3.4 LEARNING VERIFICATION

It is observed that the assessment of learning is an action that seeks to identify changes in the behavior and performance of students, confirming whether the construction of knowledge has been processed. Verification, in turn, for Luckesi (2011) happens in most assessment processes, but it is a little different from learning assessment as Tyler (1981) said in our definition of assessment. Therefore, the definition of this process is very important for the development of the research, because it is necessary to understand these differences.

According to Luckesi, the term verify comes etymologically from the Latin – Verumfacere – and means “to make true”. However, the concept of verification emerges from the conduct determinations of intentionally seeking “to see if something is really that...”, “to investigate the truth of something...”. (LUCKESI 2011, p. 52). Thus, the term verify comes from the truth, to see if something is the same or proof. Still in Luckesi's conception, the verification process comes from “observing, obtaining and analyzing data and synthesizing the data or information.” (LUCKESI 2011, p. 52) that makes a limitation of the object or action from which one works. In this way, verification focuses on obtaining information about the individual in order to see whether or not he has learned certain content. We can certainly say that this process happens most of the time in tests, in which the teacher only checks if the student has learned or not.

Libâneo (2013) presents that the verification of learning is one of the moments of the teaching process that consists of a “collection of data on student achievement” (Libâneo 2013, p. 217), which can be used diversified instruments where one of them it's the proof. Thus, it is possible to notice that learning happens with several verification instruments, for our research the instrument to be used will be the test.

In Luckesi's idea, verification ends when “The dynamics of the act of verifying ends with obtaining the data or information that is sought, that is, “one sees” or “one does not see” something. And... that's it! In itself, verification does not imply that the subject draws from it new and significant consequences.” (LUCKESI 2011, p. 52).

The verification of learning consists only of knowing if the student has learned or not, without further benefits other than the evaluation that the teacher observes and plans a pedagogical intervention.

3.5 ASSESSMENT INSTRUMENTS

Through the authors' previous definitions, it is understood that learning assessment is a continuous process that proceeds at various moments of the work. This verification takes place at the beginning

(diagnostic), during (formative) and at the end (summative) as already defined . For verification according to Libâneo (2013) adequate instruments are needed.

For Hoffmann (2011), some teachers confuse assessment instruments of some units with documents used to record student performance. However, for other teachers these instruments are understood as tests/exams and applied tasks, which, when analyzed, serve as data for monitoring student learning.

Still in this author's conception, when “assessment instruments” are mentioned, they are referring to tests/exams and tasks applied to students during the teaching units.

Thus, Moretto (2005) says that the assessment of learning is done in different ways, and with various instruments that are used according to need, the most common among them is the written test. In other words, there are other assessment instruments and not just the “test”.

As an example, Libâneo (2013) cites some assessment instruments at different stages of the teaching-learning process, such as:

At the beginning of a unit... a survey of the students' previous conditions should be carried out, through a review of previous material, correction of homework, quick tests, short dissertations, guided discussion, didactic conversation, etc. During the development of the unit, students' performance is monitored through exercises, guided study, group work, behavioral observations, informal conversations, subject recall, and formal verifications are carried out through essay tests, question tests objective, oral argument. At the end of a didactic unit or bimester, performance tests are applied. (LIBÂNEOP 2013, p.226)

It is understood then that the evaluation process takes place with diversified instruments and procedures. That is, the teacher can evaluate the knowledge acquired in the classroom, in tests, assignments, etc.

For this research, we focus on identifying the positive and negative points of each methodology using the most “common” instrument in our daily lives, in this case the test.

In view of this, the need arises to define proof.

3.6 TEST

According to the interpretation of Rocha (2005) in relation to the electronic dictionary Houaiss (2002), the proof is conceptualized in:

That which demonstrates that a statement or fact is true; evidence evidence; act that gives a full demonstration of (effect, fidelity, happiness, etc.); manifestation, sign; school work, composed of a series of questions, whose purpose is to assess the student's knowledge; test, exam. (ROCHA 2005, p. 25).

Based on this definition, it is understood that in the test the student demonstrates whether the content worked by the teacher was developed or not.

According to Luckesi (2011), the test or exam, in school learning, aims to verify the student's performance level in a certain content and classify in terms of approval/failure. In other words, the test/exam is just a classifier where you assign quantitative results to your students.

Piletti says that “in the test, students develop a uniform set of tasks and are aware that they are being evaluated”. (PILETTI 2001, p. 196/197)

For Libâneo (2013), the tests are applied only to measure the memory capacity. However, the test and other verification instruments are necessary means for the search for information on student performance.

Therefore, the test can serve to measure the student's ability to memorize formulas. However, on the other hand, it can also verify if the student knows or not the content worked by the teacher, that is, it shows the students' performance.

In view of the authors' definitions, it is understood that the test assesses both the ability to memorize and the student's development, in which the student knows he is being evaluated.

3.7 MATHEMATICAL FORMULAS

One of the main topics of the study is the definition of mathematical formulas, as discussed in the present study.

Silveira says that “The formulas are algebraic expressions that represent rules, and they need to be interpreted. Following a rule is interpreting, and interpretation demands the reading and translation of its signs.” (SILVEIRA 2006, p. 5/6).

Ribeiro defines mathematical formulas and algebraic equations as

It originates from a practical problem, and the solution can be found using arithmetic knowledge. However, both the teachers and the students they investigated wrote an equation for the problem and found the solution through some known algebraic technique or algorithm. (RIBEIRO 2013, p. 67)

In this way, Ribeiro uses the term formula implicitly as an algebraic technique and algorithm that serves to solve equations for a problem. Therefore, mathematical formulas are techniques, algorithms or a pre-defined equation where they are applied for a faster resolution of problems.

4 RESULTS

4.1 RESULTS OBTAINED IN THE INTERVIEWS

In this topic, we present the analysis of data referring to the questionnaire applied to mathematics teachers who work in elementary, high school and higher education.

In order to identify whether teachers use the availability method or not during their assessment practice, the following questions were asked:

Question 1: In the verification of learning using the test instrument, you make the formulas available to the student, what do you think about it?

The results obtained were that 60% of the teachers answered that they always use this evaluative practice and 40% use it sometimes and that it depends a lot on the content worked. Responses were obtained mainly referring to remote teaching due to health restrictions that occurred during the COVID-19 pandemic, such as:

High School Math Teacher Response - “The pandemic showed me a new way of evaluating, understanding the difficulty during the resolution, for me, it is more important than the difficulty in memorizing” .

Higher Education Mathematics Teacher Answer – “I have noticed that if the student does not know how to apply it beforehand, it becomes uninteresting for him, this in engineering courses, so asking him to memorize formulas is unfeasible”.

It can be seen that the way in which the learning of certain content is verified is being rethought by both parties, both teacher and student. This brings us to the following question, what about the use? Has it improved?

Question II: Does having the formulas in the test help the student to do better in the assessment?

Respondents were punctual and 20% said yes and 80% said no or sometimes. It can be seen that teachers indicate that the student's grade is not always better when they make the formulas available, as some justified below:

Elementary School Math Teacher Answer – “If you give me a physics formula of a super advanced content, I won't even know how to apply it. The same is true in mathematics, there is no point in having the formulation without knowing what you are talking about”;

Higher Education Mathematics Teacher Answer – “Having the formula written in a draft does not indicate that you know how to solve the problem, so the result is not so much better unless you know at least how to solve it”;

Higher Education Mathematics Teacher Answer – “Improvement for those who know how to solve”.

High School Math Teacher Response – “Depending on the content, it improves significantly . As is the case with trigonometry and geometry.”

High School Math Teacher Response – “It improves considerably, but I teach strategies to remember like songs and rules that are easy to memorize.”.

High School Math Teacher Answer – “It depends on the content”.

Through the teachers' answers, it is possible to perceive the results depending on the content and the amount of formulas that are addressed. Quite formalized content such as volume studies, area and financial mathematics, for example, requires a large amount of expressions for direct calculations.

Question III was asked with the objective of discovering the points in which the availability can help in the learning of the content.

Question III: What are the possible points that the availability of mathematical formulas can help in the learning of your students?

Justifying his methodology, the teacher says: *Answer high school mathematics teacher - "If he knows how to develop calculus, it will help him if not, no."* That is, for those who know how to do or develop the calculation involved, the mathematical formulas will help, and those who do not know how to develop it, will not. Since, according to our question previously discussed, teachers evaluate the development of the question, making the memorization of the formula an uninteresting subject as seen also in question I.

This agrees with the idea of the author Starepravo (2004), who asks the following question: "What is more important, after all, to know the formula [...] or to think mathematically" (STAREPRAVO 2004, p. 2), hence, according to Dante's studies cited by Pereira (2007), assessing mathematical development or thinking has greater emphasis in mathematics teaching.

Some points that the availability helps according to the teacher's speech and can assume that such a methodology helps in *Answer high school mathematics teacher - "Being a facilitator when studying"*. The availability of formulas during the evaluation generates *a response to high school mathematics teachers - "More interest in solving the question"* because *"The student is not worried about memorization, thus making him more confident in the resolutions."* However, *High School Mathematics Teacher Answer - "The important thing is that the student understands the process that reached that formula so that he knows how to do it."*

And what are the harmful points of the availability of mathematical formulas.

Question IV: What are the main points that the availability of mathematical formulas can harm in the teaching/learning of your students?

The teachers' answers can be seen as a common concern, especially with high school teachers: *High School Mathematics Teacher Answer - "Lack of memorization skill"*.

High School Mathematics Teacher Answer - "At the time of competitions and/or entrance exams."

High School Mathematics Teacher Answer - "Day to day, contests and entrance exams."

Higher Education Mathematics Teacher Answer - "It can be harmful when trying a contest, such as in the engineering area, where he will not have any formulas available".

Elementary School mathematics teacher response - "I don't see any negative points, as long as learning is well consolidated".

That is, the main points in the teachers' conception that the availability can harm are in the contests or entrance exams that the student will not have the formulas available at all times, and that the student may become dependent on the formulas as an "addiction" cited by a student. of teachers: *High School Math Teacher Response - "I believe the only negative point is the addiction that can occur. The student may become dependent on formulas to solve the test"*.

Question V: What is your opinion on the availability of mathematical formulas in the verification of learning?

Elementary School Mathematics Teacher Answer - “I think it is a valid practice, as it can contribute a lot to arouse student interest in the content, and in most questions what matters is not the formula itself, but its application and how to use it. ”.

Justifying the use of formulas, the teacher says that it can help the student to become more interested in the mathematical content. However, it is observed that some who agree with the availability, however highlight some points that can be harmful such as:

High School Mathematics Teacher Answer - “I'm in favor, I don't see any problems, because the student who doesn't know the content, just the formulas in just doesn't help much”.

High School Mathematics Teacher Answer- “It is interesting, however, as it helps the students by “memorizing”, the student is also harmed, because, for example, “ENEM”, “contests” are not facilitators like that”.

High School Mathematics Teacher Answer- “The student will not be firm or confident when performing another assessment that requires memorization, but I see that the general perspective of the test has been changing, the contextualization, application and how that is approached in everyday life. day is increasingly being charged. This idea of here is the equation and solve it has been outdated for a long time”.

Higher Education Mathematics Teacher Response – “The pandemic brought this new vision of evaluation, I believe that this plastered idea of decorating will become less and less usual, but, however, you should be careful and not generalize so much.”.

High School Mathematics Teacher Answer - “I like to make the formulas available to students, I feel that it brings more security for them to learn and not worry so much about memorizing, but I think that at the time of an entrance exam and/or contest it can harm them. it, as these selection processes often require decorating.”.

High School Math Teacher Answer - “I like the practice of making formulas available, but memorization also helps to stimulate students.”.

As can be seen, teachers realize that memorization has been less and less used, but there is a caution in this type of practice. Today, some selection processes, which are common in student life, address this type of requirement and are of great concern to teachers.

5 FINAL CONSIDERATIONS

Based on these statements, it can be concluded that teachers are inclined to support the availability of formulas during the evaluation practice. They are concerned with learning the method, problem-solving reasoning and learning the process, but they do not fail to highlight the points that harm this evaluative practice with selective processes that somehow require the memorization of content. It can be seen that the

pandemic moment that occurred from 2019 brought new experiences and visions to teachers, reflecting on the learning verification process.

However, as some teachers mentioned, memorization can also serve as a stimulus to studies and cannot be a discarded methodology. As Soistak (2014) says:

Memorization can contribute a lot to the modification of these negative concepts, because from the moment that the student masters the basics through memorization, he can come to understand and learn mathematics, performing activities with pleasure, in addition to his self-esteem being valued at this time. (SOISTA K 2014 , P. 9)

Therefore, the way in which the verification of mathematical learning is approached must be analyzed according to each class. The analysis of the profile that the student has, the goals of the teacher and student can change the way to evaluate learning.

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CHAPTER 75

Mapping of Nursing Research Groups in the Management Area in Brazil

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ABSTRACT

Objective: The present study aims at the Mapping of Nursing Research Groups in the Management Area in Brazil arranged in the Directory of the National Council for Scientific and Technological Development (CNPq) as of 2017. In this sense, the research is committed to providing concrete data on distribution, year of creation, institutions to which they are linked, and quantification of scientific production on Nursing Management, identifying the most and least predominant themes. **Methodology:** This is a descriptive-analytical documentary study, with a quantitative approach through scientometric analysis. The research was carried out in 5 stages. The first step is related to data collection through the parameterized search, in the current base, as the search descriptor “Nursing Management”, the second step is the screening of groups in the management area with certified and updated status, the third step is the grouping and interpretation of the data obtained in an excel spreadsheet, the fourth was the survey of the research projects of the groups, and the fifth resided in the categorization of the projects into thematic axes: 1) Patient safety; 2) Workers' health; 3) Care management; 4) Competencies; 5) Quality Management; 6) Educational management; 7) Cost management; 8) Evaluation of health services; 9)

Permanent Education; 10) Management in health services; 11) Organization of work; 12) Risk management; 13) Decision making; 14) Nurse's work process; 15) Staff dimensioning and 16) Resource management. **Results and Discussion:** We found 70 Research Groups registered in the CNPq Directory. Subsequently, the selection process began, and after excluding the groups in a situation of completion (4 groups), excluded (11 groups), not updated (13 groups) and those not framed in the theme (5 groups), the quantitative remained 38 research groups in the area of nursing management. As a limitation of the research, it was observed that many researchers do not keep their curricula on the Lattes platform with their data properly updated, and the instability of the collection. **Conclusion:** The research pointed to 38 research groups in the management line, which were located in public higher education institutions. Additionally, it showed a concentration of about 42.11% in the state of SP, with USP holding 23.68% of the number of research groups. Five new groups emerged during the pandemic period, thus revealing the need to encourage the implementation and permanence of these spaces within private universities, isolated colleges, technological education centers, and federal centers of technological education. During the document analysis, a total of 166 projects, in this way, Educational Management represents, 16.27%, the most predominant theme, and Resource Management, with 0.60%, the lowest percentage of productions. The results demonstrate the need for more studies to better understand the disposition of these Groups, incentives related to the exploration of less predominant contents, and factors that influence the permanence and activity of the Groups.

KEYWORDS: Nursing; Professional Practice Management; Health Management; Research Groups; Organization And Administration.

1 INTRODUCTION

With the advent of COVID-19, the spotlight turned to the professional nursing category, exposing their working conditions and relevance in facing the pandemic in the current scenario. The provision of

health care services by nursing is feasible and guided through management. The act of managing transcends the static, it is understood as a dynamic production, articulating practices such as analysis of the work process, research, cooperation, communication and active listening to the individuals involved (Santana et al., 2022; Sanchez et al., 2022; Sanchez et al. al., 2020; Silva et al., 2020).

Management actions in the sphere of nursing care are directly related to the quality of care provided, thus, where care takes place, management is present. As a result of the new demands that emerge from today's society, the construction of competent professionals begins in the nursing school and within this environment, the sharing of scientific knowledge is attributed to research groups. Therefore, the student's involvement in these spaces allows a reflective practice and generation of new knowledge, which aims to improve the quality of care and nursing practice. In this way, giving, in a material or immaterial way, not only to nursing, but also to society (Fachola et al., 2022).

Within this context, the research process is inherent to the implementation of new practices, improvement and updating of health professionals. In this way, ensuring more trained and qualified professionals, in addition to a positive impact on patient care (Ramos et al., 2022; Barreto et al., 2018).

Research groups in Brazil have lines of research, action based on norms and are included in the National Research Council, through registration in the Directory of Research Groups. They are formed by a team of professors/researchers, undergraduate students, graduate students (*lato sensu* and *stricto sensu*) and technicians from the higher education institution. It can be said that they are responsible for the production of scientific knowledge within the academic environment. Additionally, they are characterized as open spaces that facilitate the exchange of knowledge, exposition of ideas, creation of bonds, expansion of perspectives and interprofessional collaboration (Rossit et al., 2018; Silva et al., 2020).

Effective participation in research groups encourages critical thinking, reflection and the creation of technologies and innovations within the scientific scenario, through investigations, discussions and questions made within a given area, seeking to expose knowledge, revealing the results, relevance and material and/or immaterial products (Silva et al., 2020).

A research group can be defined as a collective activity that involves observation, experimentation, discussion and production in an area of knowledge, being a didactic environment conducive to group work. Because it is a place that provides an opportunity for discussion, promotes increased interaction between members and enhances the confrontation of their previous knowledge with other possibilities and explanations, as well as relates theory to practice (Moreira et al., 2018; Silva et al., 2020).

The Directory of Research Groups (DGP) in Brazil began its activities in 1992 at CNPq. The DGP can be characterized as a kind of inventory of scientific and technological research groups in productivity distributed throughout the national territory. In this way, the creation of a permanent research activity by a given institution is a prerequisite for its integration. Thus, the beginning of the stage of elaboration and design of activities aimed at research in an institution does not occur through the DGP (Coxe et al., 2019).

The information entered in the DGP is related to human resources issues that make up the groups

(academics, students, technicians and researchers), the production of knowledge (artistic, scientific and technological), the research segments in continuity, the spheres of application and partnerships between groups and institutions. Based on these data, it is possible to describe the general panorama of scientific-technological production in Brazil and its limitations. Furthermore, the DGP is composed of a current database in which data are systematically updated by the representatives of the groups. Additionally, it is worth mentioning that the censuses take place biannually, they work like a camera, recording in a photo the current base at that particular period and moment (Conselho Nacional de Pesquisa, 2022; Moreira et al., 2018).

The DGP has three main objectives: (1) To serve as a powerful information tool, thus, it can accurately report data on the members, location, finished and ongoing productions; (2) Its census character enables the construction of numerous reflections and research, revealing fields not reached, for example, qualitative assessment of the knowledge produced. Undeniably, this aspect makes it fundamental to the administration and management process; (3) Function as a kind of album, preserving all artistic, scientific and technological production in Brazil (Conselho Nacional de Pesquisa, 2022; Azevedo et al., 2019).

The National Research Council, in the organizational sphere, distributes the areas of knowledge in large areas, basic areas, sub-areas and specialties. On the other hand, in the DGP, the identification of research groups can occur by basic areas and large areas of knowledge (Coxe et al., 2019).

The present study aims to map the Nursing Research Groups in the area of Management in Brazil registered in the Directory of the National Council for Scientific and Technological Development (CNPq).

2 METHODOLOGY

This is a descriptive-analytical study, with a quantitative approach using scientometric analysis, this is the “quantitative analysis of science, based on secondary sources, without direct observation of the knowledge production process without direct evaluation of the results”. In this sense, it studies the emergence and expansion of scientific areas, the formation of human resources and compilations of scientific indicators, overlapping with bibliometrics, which develops patterns and mathematical models to examine the quantitative aspects of the production, dissemination and use of recorded knowledge. (Alvarado & Restrepo, 2018; Momesso & Noronha, 2017).

Scientometrics emerged in the extinct Union of Soviet Socialist Republics (USSR) and gained prominence in the world with the arrival of the Hungarian journal *Scientometrics* in 1977. It is identified as a science that studies scientific coefficients to give quantitative values to a survey, journal or even researcher ; it is the study of the quantitative aspects of science as a discipline or economic activity. It is a segment of the sociology of science, being applied in the development of scientific policies. In other words, the purpose of using it in research is to bring out more clearly and objectively the number of active research groups dedicated to nursing management. In this way, through reflections, propose research and stimulate the expansion of scientific production in the area of management. (Alvarado & Restrepo, 2018).

The quantification of Research Groups arranged in the Work Process Manage in Nursing took place through the Website of the Directory of Research Groups of the National Council for Scientific and Technological Development (CNPq), following the following steps:

First step

Step 1: Type “CNPq Research Group Directory” in the Google Chrome search box.

2nd Step: Click on “Research Group Directory - Lattes Platform - CNPq” as a result.

3rd Step: On the website of the Directory of Research Groups in Brazil of CNPq, on the Lattes platform, select the option “Search for Groups”.

4th Step: Keep selecting the Current Base and Current Census system.

5th Step: Type in the search term: Nursing Management and select the option “All words” in the box next to it.

6th Step: In the selection box below, search for : “Group”.

7th Step: Keep the markings proposed by the system in the part of “Apply the search in the groups” and “Status: Certified and Not updated”.

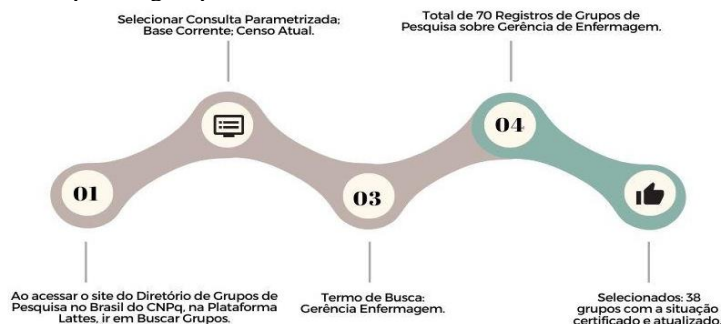
Step 8: Then click on “Search”.

9th Step: Through the parameterized query, with the following directions: current base, current census and, using the search term “Nursing Management”, 70 Research Groups were found registered on the platform Directory of Research Groups in Brazil of the National Council of Scientific and Technological Development (CNPq).

10th Step: After collecting the collected data, the groups were arranged in an excel spreadsheet to enable the mapping. The following figure presents the steps of the methodological path carried out to search for Research Groups in the Directory of Research Groups in Brazil:

Figure 1: Stages of research development, Niterói-RJ, 2022.

1. When accessing the Directory of Research Groups in Brazil website of CNPq, in the Lattes platform, go to Search Groups.
2. Select Parameterized Consult; Current Base; Current census
3. Search Term: Nursing Management
4. Total of 70 registers of Research Groups on Nursing Management
5. Selected: 38 certified and updated groups



Source: prepared by the authors (2022).

Second stage

1st Step: The mining process was carried out, after excluding the groups in a situation of filling (4 groups), excluded (11 groups), not updated (13 groups) and those not included in the current theme (5 groups), 38 remained. research groups in the area of nursing management.

third stage

1st Step: Grouping the data obtained in an excel spreadsheet.

fourth stage

1st Step: Survey of the research projects of the groups. Search carried out in the lattes of the leader and vice-leader of the research group.

fifth stage

1st Step: Measurement and categorization of projects into thematic axes, namely: 1) Patient safety; 2) Workers' health; 3) Care management; 4) Competencies; 5) Quality Management; 6) Educational management; 7) Cost management; 8) Evaluation of health services; 9) Permanent Education; 10) Management in health services; 11) Organization of work; 12) Risk management; 13) Decision making; 14) Nurse's work process; 15) Staff dimensioning and 16) Resource management.

3 RESULTS AND DISCUSSION

Research groups in the area of management provide essential tools for the construction and development of critical thinking in university students, based on the principle of cooperation and collectivity. Additionally, they return the health benefit to society as a final product of their research (Andrade et al., 2019).

Based on the above, it appears that the work of research groups is beyond the university's walls. Therefore, it is essential to guarantee the continuity of training and growth of health professionals (Mendes et al., 2021).

The data collected on the platform Directory of Research Groups in Brazil of the National Council for Scientific and Technological Development were grouped and organized into a single table, as illustrated below, for analysis and discussion purposes.

Figure 3: Result of the search for research groups arranged in the CNPq Directory in the line of management by Brazilian states, year of creation and institution of higher education. Brazil, 2022.

Research Groups	state	year of formation	HEI
Care and Epidemiological Practices in Health and Nursing	RN	1994	UFRN
Center for Studies and Research on Hospitals and Nursing	SP	1996	USP
Bioethics and Administration: Teaching and Health Care	SP	1997	USP
Studies on the Health of Nursing Workers	SP	1997	USP
History, Bioethics and Nursing Legislation	SP	1997	USP
Center for Research and Studies in Collective Health	MG	2000	UFMG
Citizenship and Management in Nursing	RJ	2001	UFF
Economic dimension of nursing management	SP	2001	USP
Research Group on Nursing in Mental Health and Epidemiology	AM	2002	UFAM
Research and Extension Group Health Care Management and Nursing Care	RJ	2002	UFRJ
Nursing Administration Research Group	SP	2002	UNITAU
Ecosystem Management in Nursing and Health	LOL	2003	FURG
Study and Research Group on Administration and Information in Health and Nursing	PB	2003	UFPB
Study and Research Group on Health/Nursing Policies and Practices	DF	2003	UnB
Management and Education in Health and Nursing in the Interprofessional Collaborative Perspective	SP	2004	USP
Studies on Health and Nursing Management	SP	2007	UNESP
Quality and Safety in Nursing and Health Services	SP	2007	USP
Research Group on Health Policies, Management and Practices	PR	2008	UFPR
Study and Research Group in Nursing and Health Education and Practices	SP	2008	UNICAMP
Patient Safety Study and Research Group	SP	2008	USP
Ethics and Humanization in Health	SP	2010	FCMSCSP
Caring - Managing in Nursing	SP	2010	PUC
Study and Research Group in Nursing Education, Management and Ethics	RJ	2011	UFF
Study and Research Group on Nursing Care Management	SP	2011	UNICAMP
Leadership, Management and Management of Health and Nursing Services	SP	2011	USP
Center for Studies and Research in Management and Informatics in Nursing	SP	2012	UFSCAR
Laboratory of Studies in Health Services Management	DF	2012	UnB
Research Group on Nursing Care	BA	2012	UNEB
Laboratory of History of Care and Image in Nursing - Lacuiden	RJ	2013	UNIRIO
Health and Nursing Management	MG	2014	UFJF
Studies on experiences and integrality dedicated to nursing	RJ	2016	UFF
Study and Research Group on Health Assessment, Technology and Innovation	PR	2018	UEL
Research Laboratory, Practices and Simulated Teaching in Nursing	RJ	2019	UFF
Management Study Group in Scientific Publishing and Occupational Health	PR	2020	UEL
Study group on mental health policy and care	PR	2020	UEL
Health and Nursing Management	ES	2020	UFES
Research Group on Knowledge Management in Health and Nursing	RJ	2020	UFRJ
Research Group in Epidemiology and Public Health	DF	2020	UnB

Source: Adapted from http://dgp.cnpq.br/dgp/faces/consulta/consulta_parametrizada.jsf (2022).

It appears that the number of 38 research groups in the management line are, for the most part, arranged in higher education institutions.

As shown in Figure 4 , the University of São Paulo (USP) represents 23.68% of the total of 38, concentrating the highest percentage of research groups. In second position, we have the Universidade Federal Fluminense (UFF) with 10.53% and in third position the University of Brasília (UnB) and the State University of Londrina (UEL) with 7.89%. the need for reflection and research on the reasons that lead to the distancing of municipal universities and non-academic institutions, such as, for example, integrated faculties, schools, isolated faculties and academic centers. The analysis warns of the lack of expansion in these spaces.

Figure 4: Distribution of research groups according to higher education institution. Brazil, 2022.

HEI	groups	%
FCMSCSP	1	2.63%
FURG	1	2.63%
PUC	1	2.63%
UEL	3	7.89%
UFAM	1	2.63%
UFES	1	2.63%
UFF	4	10.53%
UFJF	1	2.63%
UFMG	1	2.63%
UFPB	1	2.63%
UFPR	1	2.63%
UFRJ	two	5.26%
UFRN	1	2.63%
UFSCAR	1	2.63%
UnB	3	7.89%
UNEB	1	2.63%
UNESP	1	2.63%
UNICAMP	two	5.26%
UNIRIO	1	2.63%
UNITAU	1	2.63%
USP	9	23.68%
TOTAL	38	100%

Source: Adapted from http://dgp.cnpq.br/dgp/faces/consulta/consulta_parametrizada.jsf (2022)

According to figure 5, the state of São Paulo is the most privileged region in terms of the number of research groups, representing 42.11% of the total of 38 research groups. In second position, we have the state of Rio de Janeiro with 18.42% and the state of Paraná with 10.53%, occupying the third position.

The state of São Paulo, presumably, for having a large concentration of institutions and organizations, ends up showing a significant number of Research Groups when compared to other states. It is worth mentioning that the region also has the largest number of doctors and post-docs in the country, which explains the finding and takes them to the top as leaders of research groups (Coxe et al., 2019).

Figure 5: Distribution of research groups in the management line by Brazilian states. Brazil, 2022.

States	groups	%
AM	1	2.63%
BA	1	2.63%
DF	3	7.89%
ES	1	2.63%
MG	two	5.26%
PB	1	2.63%
PR	4	10.53%
RJ	7	18.42%
RN	1	2.63%
LOL	1	2.63%
SP	16	42.11%
TOTAL:	38	100%

Source: Adapted from http://dgp.cnpq.br/dgp/faces/consulta/consulta_parametrizada.jsf (2022).

Regarding the year of creation, despite the pandemic context, a large concentration was identified in the period 2020, as shown in Figure 6. The oldest group was created in 1994 and this reveals a difficulty, whether in the context of financial development, human resources and even lack of time, in their continuity and permanence.

Figure 6: Distribution of research groups by year of creation. Brazil, 2022.

year of creation	groups	%
2020	5	13.16%
2019	1	2.63%
2018	1	2.63%
2016	1	2.63%
2014	1	2.63%
2013	1	2.63%
2012	3	7.89%
2011	3	7.89%
2010	two	5.26%
2008	3	7.89%
2007	2	5.26%
2004	1	2.63%
2003	3	7.89%
2002	3	7.89%
2001	2	5.26%
2000	1	2.63%
1997	3	7.89%
1996	1	2.63%
1994	1	2.63%
TOTAL	38	100%

Source: Adapted from http://dgp.cnpq.br/dgp/faces/consulta/consulta_parametrizada.jsf (2022).

During the document analysis, as shown in Figure 7, a total of 166 productions was found, allocated according to the respective themes: (1) Patient safety; (2) Workers' Health; (3) Care management; (4) Competencies, (5) Quality management; (6) Educational management; (7) Cost management; (8) Evaluation of health services; (9) Continuing Education; (10) Organization of work; (11) Risk management; (12) Decision making; (13) Nurse's work process; (14) Personnel sizing; (15) Resource management and (16) Management in health services. Thus, Educational Management represents, with 16.27%, the most predominant theme and Resource Management, with 0.60%, the lowest percentage of productions.

Figure 7: Prevalence of project themes in Nursing Management Research Groups, 2022 .

Project Themes - Quantification of the Project themes - Percentage of the Project Themes

- Patient security
- Worker's health
- Care management
- Proficiencies
- Quality Management
- Educational Management
- Assessment of health systems
- Permanent education
- Management in health systems
- Work arrangements
- Risk management
- Decision making
- Nurse working process
- People sizing
- Resources management
- Total of productions

Temas dos Projetos	Quantificação dos Temas dos Projetos	Porcentagem dos Temas dos Projetos
Segurança do paciente	15	7,23%
Saúde do trabalhador	20	12,05%
Gerenciamento do cuidado	15	9,04%
Competências	8	4,82%
Gestão de Qualidade	9	5,42%
Gestão educacional	27	16,27%
Gestão de custos	6	3,61%
Avaliação dos serviços de saúde	6	3,61%
Educação Permanente	14	8,43%
Gestão nos serviços de saúde	16	9,64%
Organização do trabalho	11	6,63%
Gestão de risco	3	1,81%
Tomada de decisão	2	1,20%
Processo de trabalho do enfermeiro	10	6,02%
Dimensionamento de pessoal	2	1,20%
Gestão de recursos	1	0,60%
Total de produções	166	100,00%

Source: The authors (2022).

The propositions reported imply the lack of studies aimed at the continuity of groups, expansion of the same in private, technological and scientific institutions and amplification of less predominant themes.

The findings brought in the figures, from the current census of the Directory, bring worrying results for the current reality. It is considered essential to fight for these spaces of academic insertion, expansion, preservation and valorization for a more critical and engaged education with the present. Focusing on the survey of research groups in the management line and understanding the projects that arise from these spaces is fundamental because it makes it possible to understand trends in the production of knowledge and research, in addition to identifying authors and academic partnerships.

Universities are highly capable spaces for scientific resourcefulness, fabrication of interventions and/or solutions aimed at problems identified in society and implementation of significant changes to the socioeconomic process. In this context, research groups function as a kind of entry and exit door for the somatization of knowledge (Souza et al., 2019).

The research group's essence is to engage its members through interest in the management line and involve them in theoretical references, in order to train them in the development of practical activities, thus reaching scientific maturity. In addition, it is worth mentioning that the vast majority of members end up building a welcoming space and affective relationships, which has a positive impact on the process of mitigating adversities in the research stages (Souza et al., 2020).

4 CONCLUSION

The research groups in the Nursing area, in the Nursing Management subarea, have lines of research and projects on different themes in the management area. The results demonstrate the need for more studies to better understand the disposition of these Groups, incentives related to the exploration of less predominant contents and factors that influence the permanence and activity of the Groups. Through the research carried out, it was possible to quantify and analyze the Research Groups on Nursing Management in Brazil. Regarding the contribution of the study, the collection of data for questions, reflections and collaborations for further research in this segment is elucidated.

The quantitative survey totaled 38 research groups in the management line, these, arranged in public higher education institutions. It pointed to a concentration of 42.11% in the state of SP, with USP holding 23.68%. Additionally, it identified the creation of five new groups during the pandemic context and revealed the need to stimulate the implementation of these spaces within private universities, isolated colleges, technological education centers and federal centers of technological education.

The involvement of university students in management research groups largely contributes to the formation of a professional with a reflective and science-based practice. Although a group contemplates a certain area of knowledge, this one goes through the resignification of knowledge, after all, each member carries and brings with him, in a unique way, his perspective and worldview. It is considered fundamental to fight for these places of academic insertion, for the expansion, for the preservation and valorization for a more critical and engaged education with the present. The group needs to keep in mind that it is not just occupying a space, but occupying in order to build and thus transform.

As a limitation of the study, there is the instability on the platform, sometimes outside the area. This ended up implying a longer data collection.

Bearing in mind the importance of mapping in this sense, as future works, it is expected to carry out the measurement and categorization of the management themes worked on in the groups, their respective projects and the most researched subjects. In addition, it is understood as essential to broaden the discussion by including more studies and adding the regional difficulties for carrying out research groups, calling due attention to the regions that do not have them.

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CHAPTER 76

Nonepileptic seizure: paroxysmal events of psychogenic origin

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ABSTRACT

This article deals with non-epileptic seizures in paroxysmal events of psychogenic origin. It discusses the difficulties that health professionals, responsible for diagnosis, have when dealing with individuals who present epileptic signs and symptoms, but which are not related to epilepsy. In this context, the general aim is to investigate how the process of diagnosis of non-epileptic Psychogenic Crisis (PNES) takes place. To

this end, the methodological procedure reported the use of bibliographic research through data collection of published articles that cover and portray the theme directed to clinical practice, thus, academic publications were analyzed, selected those of interest, and through observation, the data were analyzed to gather the knowledge produced on the subject. After the research, it was concluded that health teams must know the characteristics, diagnosis, and treatment of a PNES so that when facing any apparent occurrence, the individual's life history is investigated in detail and the individual is referred to video-electroencephalography to correctly rule out or confirm the investigation and offer a resolute treatment.

Keywords: Psychogenic, non-epileptic seizure; Epilepsy; Video-Electroencephalography; Traumatic events

1 INTRODUCTION

The Psychogenic Nonepileptic Seizure - PNES is determined by episodes of sudden or gradual alteration of behavior, movement, sensation, or consciousness, like the convulsion, non-fictitious that are presented through the motor, sensory and psychological expressions, which in turn are not caused by irregular epileptic discharges, but which are related to probable mental suffering. From this, the possibility of confusion in the diagnosis is common, since the lack of in-depth investigations by professionals and incomplete information about the patient, referring to their symptoms, hinder the diagnosis.

The NECP was named by neurologists of the contemporary age, soon after the insertion of the video-electroencephalogram (EEG) in epilepsies centers. From this milestone, around 1964, Liske and Forster originated the term pseudo-convulsions, which would also mean such events without alterations equal to that of epilepsy, which could be observed through the EEG (Liske & Forster, 1964; Goodwin & Gross, 1979). Consequently, different words have emerged, however, the most used in a scientific way are "psychogenic non-epileptic seizures", and "dissociation", which are seen as defense methods that help the user to deal with traumas, so the NECP also understands that traumatic situations generate mental dissociation.

Above all, tremors, movements of push-ups and extensions, absence of responses, fainting, and tonic posture, are reflexes of a PNES, with a remarkable change in the level of consciousness, however,

which does not portray abnormality in the EEG. There is also relativity and variations in the personality profiles of each individual with the crisis, which, in addition to the difficulties they face in dealing with their daily problems, have a greater tendency to suffer from anxiety, depression, disorders, and post-traumas.

Despite the possibility of confusion in the diagnoses, there are several ways to differentiate epilepsy from NECP, as it is also possible that the individual is diagnosed with both types of seizures, which makes it more challenging to reach a reliable conclusion about the case. However, the main causes that differ are based on the duration of the episodes and the outcome of the EEG, in which the appropriate treatment for PNES requires follow-up and therapy, thus avoiding the pharmacological indication, to contribute to the quality of life and to completely cease crises.

Therefore, the discovery of PNES is a challenge, since there are not many studies in this area about what is its precise diagnosis, to differentiate it from other epilepsies. In addition to similar symptoms that may lead some specialists to a reliable non-detection, such a crisis affects about 20% to 30% of patients seen in epilepsy centers, which demonstrates the importance of being investigated (Lanzillotti et al., 2021).

A misdiagnosis induces the administration of anticonvulsants in the in-hospital environment and the indication for daily household consumption, which can cause, consequently, the appearance of damage to the patient. Given that anticonvulsants do not treat PNES, because it requires treatment with attention focused on the mental state of the patient, to be able to face and deal with daily problems.

Thus, academic studies are necessary, because they generate data and highlight alerts for the possible consequences that trigger the PNES and the most common difficulties in diagnosing it. The differential in the correct diagnosis and treatment can generate a better quality of life for patients. However, they are information that helps in the search to train professionals who should guide the family and the patient properly about the subject, reassure and resolve the issue, to alleviate the apprehension and feeling of disability in the face of facts, signs, and symptoms.

This article is based on the following problem: What difficulties do the health professionals responsible for the diagnosis have when dealing with individuals who present epileptic signs and symptoms, but which in turn are not related to epilepsy? Based on this, this research has a general objective to investigate how the process of diagnosis of PNES takes place. In continuity, the specific objectives are to identify the characteristics of the PNES, to write how the diagnosis occurs, to highlight what differs from epilepsy, and to analyze the forms of treatments for patients with NET.

2 METHODOLOGY

The bibliographic research methodology was chosen for the development of this study, with data collection of published articles that covered and portrayed the theme directed to clinical practice, to analyze the publications of interest, select, observe, describe, and classify data to gather the knowledge produced

on the subject. The articles were selected with support in consultation with the databases of the *National Library of Medicine (Medline/via PubMed)*.

Bibliographic or qualitative research is developed through studies and annotations resulting from existing research described in books, articles, magazines, theses, and others. The description becomes the basis of the themes that will be researched and, thus, the researcher performs the analysis and study through the collaboration of past authors. According to Minayo (2014):

The qualitative method is what applies to the study of history, relationships, representations, beliefs, perceptions, and opinions, products of the interpretations that humans make about how they live, build their artifacts, and themselves, feel, and think. (Minayo, 2014, p. 57)

Therefore, bibliographic research aims to clarify the problem through references exposed in books, articles, dissertations, and theses, in which we seek to understand and verify the existing cooperations of the past and current on the subject. Thus, the methodology infiltrates as a scientific strategy, the analysis, which comes from separating the parts and emphasizing the most important ones. Analogous to this, Boccato (2006) exposes that:

Bibliographic research seeks to solve a problem (hypothesis) through published theoretical references, analyzing and discussing the various scientific contributions. This type of research will provide support for the knowledge about what was researched, how and under what approach and/or perspectives the subject presented in the scientific literature was treated. For this, it is of paramount importance that the researcher performs systematic planning of the research process, comprising from the thematic definition, through the logical construction of the work to the decision of its form of communication and dissemination. (Boccato, 2006, p. 266)

Thus, bibliographic research, brought subsidies for knowledge about THE PNES, outlined as the subject is presented in the scientific literature. Systematic planning of this research process was also carried out, comprising the definition of this theme, its logical construction, and, finally, the forms of communication and dissemination. This said, after data collection, they were systematized, establishing relevant and necessary relationships for the critical analysis and discussion of this relationship, based on theories concerning.

The article in question comes from bibliographic research and made use of a narrative review analyzing theoretical materials, starting from in-depth readings about non-epileptic Psychogenic crises. Through the studies, a holistic view of the subject was obtained, which culminated in this writing. It emphasizes that the analyses went beyond quick readings, there was a deepening in the interpretation of the writings studied for evaluation as a method of inclusion and exclusion, to support production, as shown in chart 1:

Table 1: Inclusion and Exclusion Methods.

Inclusion Method	Exclusion Method
Articles that address clearly and objectively non-epileptic psychogenic crisis;	Articles that, despite addressing the subject, do not have the purpose of the research;
Articles published in the last 5 years to update the subject and articles published more than 5 years ago to associate the theme with the present;	Articles that have access restrictions;
Articles addressing the diagnosis and treatment of non-epileptic psychogenic crisis and differing from epilepsy;	Articles that do not have titration related to the theme Non-Epileptic Psychogenic Crisis.
Articles are published and available in full in scientific databases.	

Source: Authors.

Therefore, the records and the union of the most important information of the texts read, evaluated, and selected occurred, so that they could be supported by writing. Qualitative research, in which the readings performed, and the compiled data went through interpretation and reflexive and subjective inference of the researcher that culminated in the results described during the text, as well as in response to the research problem.

3 DEFINITION AND CHARACTERISTICS OF C RISE PSYCHOGENIC AND EPILEPTIC

There are two types of episodes of non-epileptic seizures, non-epileptic physiological convulsion, and non-epileptic psychogenic seizure. When it comes to the physiological issue, it means the epileptic event itself is caused by a paroxysmal systemic dismemberment, such as hypoglycemia, migraine aura, intoxications, disorders, and transient ischemic attacks. However, the non-epileptic psychogenic convulsion has no connection with brain activities but is caused due to some suffering or mental matter (Jr et al., 2013).

Therefore, PNES are called situations in which the individual has through the body manifestations that portray epileptic seizures, but which are not related to activity linked to epilepsy. Therefore, although any age may be affected by such a crisis, the index has a frequent focus on females aged 20 to 30 years (Jr et al., 2013).

It is possible to restrict the PNES to four prototypes in an etiological manner. The first is based on Freud's assumptions (Breuer & Freud, 1893-1895), having a statement that the PNES manifests itself physically due to emotional stress. The second prototype is conceived by Moore and Baker (1997), which analyzed that, the PNES is the result of learned behavior and operating conditioning, that is, the relationship between behavior and its consequence.

Consequently, the other two more up-to-date prototypes have returned to the dissociation mechanisms. Thus, Bowman (2006) reported that the PNES succeeds dissociative memories or assignments of the mind instituted by traumatic issues. According to Baslet (2011), PNES is due to an acute dissociative response to intimidation or a condition of high arousal, and even then, no prototype was found that portrays all but partially explains the crisis.

However, after THE PNES, there is a change in automatic responses that are seen as involuntary and unwanted but are motivated by the experiences of users who recall the seizures. That is, healthy

individuals can deal with negative emotions from day to day, while those who have a psychogenic crisis show abnormality in the face of emotional triggers and produce behavioral responses that portray seizure-like attacks.

4 DIAGNOSIS OF PSYCHOGENIC NONEPILEPTIC SEIZURE

In both medical and psychiatric investigations, there is reason to suspect PNES when the patient's life history involves psychological mechanisms. Therefore, for psychiatry, there are some ways to define the crisis, such as the DSM (Diagnostic and Statistical Manual of Mental Disorders) - IV and the ICD (International Code of Diseases) - 10/11, which characterize conversion and dissociative disorders and, the DSM - 5 that discusses functional neurological pathologies (Lanzillotti et al., 2021).

In fact, patients tend to have other symptoms, such as depression, anxiety, and especially trauma and posttraumatic stress disorder. Thus, the diagnosis of PNES is indispensable, since its non-identification can cause harm to the user through the high doses of anticonvulsant drugs administered in the act in which epilepsy is suspected. A priori, epilepsy, and PNES have several different signs and symptoms, as shown on the following table 2 (Anzellotti et al., 2020):

Table 2: Differences between Non-Epileptic Psychogenic Crisis and Epileptic Seizure.

Manifestations	Psychogenic Seizure	Nonepileptic Epileptic Seizure
Aura	Less frequent	More frequent
Duration of ictal events	>10 minutes	<70 seconds (<2 minutes for tonic-clonic seizures)
Seizure patterns	Non-stereotyped spatial patterns, less organized, variables, movement, and range of motion	Stereotyped and organized progression
Clinical discoveries	Asynchronous movements of the limbs, out-of-phase clonic activity, rhythmic agitation movements with episodes of inactivity, lateral movements of the head, pelvic movements, dystonic, body posture, eye closure during the event	Bilateral adduction and external rotations of the limbs followed by tonic extension of all four limbs, production of spasmodic clonic movements before ictal displacement
Vocalization	Present not only at the beginning of the event, but it can also oscillate, persist and be present, with different intensities of tone, throughout the course of the ictal episode	At the beginning of seizures
Subjective symptoms	Less frequent	More frequent
Urinary incontinence	Less frequent	More frequent
Occurrence at night	Less frequent	More frequent
Ictal self-injury	Less frequent	More frequent

Source: Prepared by Anzellotti et al., (2020), adapted by the author.

The discovery of PNES can arise through the association of data, such as individual history, EEG analyses, and home videos. For a given diagnosis, four statements are suggested, which can be considered possible, probable, clinically established, or documented (Anzellotti et al., 2020):

- **Possible PNES:** cases in which a witness or patient reports ictal events, and interictal EEG is normal. An abnormal interictal EEG may also be consistent with a diagnosis of possible PNES.
- **Probable PNES:** cases in which ictal events with a semiological indication of PNES are witnessed by a specialist physician or evaluated by video-EEG recording that also do not indicate ictal epileptiform activity. Situations in which observation of the onset of the ictal episode is missing or the evaluation is made by a physician who has no experience in ictal evaluations make the PNES "probable".
- **clinically established PNES:** cases in which an epilepsy specialist witnesses episodes and semiotic and objective findings are compatible with PNES. This includes situations in which, for example, there is resistance to eye-opening, interaction with the patient during the episode is possible, as it maintains some level of consciousness and partial responsiveness, or the ictal episode ceases as the doctor convinces the patient to interrupt him. No epileptiform activity in interictal or ictal EEG can be found.
- **CPNE documented:** cases in which the diagnosis produced by an epilepsy specialist taking into account the typical semiology of PNES and no Epileptiform activity related to EEG is found at any stage of the ictal event, or before and after it. (Anzellotti et al., 2020, p. 8)

Approximately 10% of individuals who have PNES also have epilepsy, which makes diagnosis difficult (Labiner et al., 2010). Therefore, what is sought in patients who have both diagnoses are psychiatric comorbidities that relate to epilepsy, the occurrence of a seizure, in which the PNES follows, and the appearance of symptoms in people who are recovering from epilepsy to draw the attention of the caregiver (Kutlubaev et al., 2018). Despite the difficult discovery and few studies on the double diagnosis, the same should be considered when individuals with epilepsy present unexpected types of seizures focused on characteristics and frequencies (Anzellotti et al., 2020).

Furthermore, for the proper diagnosis, it is ideal to use the expanded monitoring of the EEG (which provides the recording of the differential between the voltage between brain sites during a given time) at the time of the crisis. However, some seizures do not show irregularities in due course, during the monitoring of the EEG, or there may also be concealment of information by movements, which makes it difficult to distinguish between epilepsy and PNES (Davis, 2004).

When this occurs, it is necessary to have an analysis of data such as the history of the individual, narration of those who witnessed the fact, clinical investigations, and ictal EEG (during the crisis) and interictal (the period between convulsions) (Davis, 2004). One means that helps in the diagnosis of PNES is the home video, when recorded by a family member the occurrence of the crisis, since it makes possible the investigation and search for signs that differentiate it from epilepsy, and that characterize the non-epileptic crisis.

In summary, a reliable diagnosis is made when the patient's life history is adaptable to PNES, signs, and symptoms establish an association with PNES when evaluated and correlated with EEG and crises do not have rhythmic patterns in all phases (before, during, and after the event). A significant standard, which represents 85% of the right for the PNES, is the so-called "2 s", when at least two EEGs are performed to show normal results, in the company of two episodes of seizures every seven days and resistance to two antiepileptic drugs (Cuthill & Espie, 2005).

5 FORMS OF TREATMENT FOR PSYCHOGENIC NONEPILEPTIC SEIZURE SUFFERERS

In the scope of care and analysis aimed at THE PNES, due to the lack of research on appropriate decision-making, the referral of patients when received in basic and hospital care is performed to address specialists in epileptic seizures. Above all, treatment through drugs is not indicated, since the PNES does not respond to medication and does not cause direct sequelae, thus being treated through verbal and behavioral interferences.

Pharmacological treatment (antidepressants and anxiolytics) can occur when there are other complications and diagnoses besides PNES since individuals with such a crisis are susceptible to having other types of disorders, anxiety and/or depression, thus, there is the prescription of medications for better control of symptoms. In continuity, mental treatment turns to several types of therapies, such as cognitive, psychodynamic, interpersonal, hypnotherapy and family analysis, in addition to the need for monitoring and monitoring (Jungilligens et al., 2021). If left untreated, NECP can weaken the brain system and thus reestablish stress incitations, making them constant, which can result in a chronic clinical problem with difficult restoration (Kozłowska et al., 2018).

To Toffa et al. (2020), "Regardless of the level of certainty in the diagnosis of PNES, it is important to later refer the patient for epileptic and neuropsychiatric follow-up." In fact, referral to specialists facilitates discovery and more easily promotes the investigation of associated epilepsy to treatment as soon as possible.

After diagnosis, treatment can be divided into three parts. The first stage is focused on the communication of discovery. Empathic and positive dialogue can be performed with the patient in the presence of family members as a method for better understanding. The article " psychogenic nonepileptic seizures in children and adolescents: Part II – explanations to families, treatment and group outcomes", describes an example of the physician's approach to the family and a patient named Mary (Kozłowska et al., 2018):

You must be very relieved that Mary doesn't have epileptic seizures and that she doesn't have any unpleasant brain disease. Mary has non-epileptic seizures, which are caused by stress. There's been a lot of research on these types of seizures in the last 10 years. Now researchers have some very good hypotheses about what may be happening. It seems that the brain is very sensitive to the effects of stress. Now, when I say "stress," I mean any event that the body finds stressful – illness, injury, or emotional distress caused by stressful life events or trauma. Now, in Mary's case, it seems that [the stressors left in family history] have activated her stress system – including stress systems in

her brain. We know that your stress system is activated because your body is signaling this in several ways: [identify stress-related symptoms suffered by the child, such as pain, increased respiratory rate, increased heart rate]. Looks like Mary's stress system's been turned on, but it's not shutting down as it should. Nonepileptic seizures are just another type of stress symptom. Mary is also a girl, and she is post-pubertal. All of these stress-related disorders are more common in girls because female sex hormones also activate the stress system. (Kozłowska et al., 2018, p. 166)

In fact, the body's defense responses are anticipated by changes in arousal. Thus, NECP can be triggered by sudden elevation in cortical excitation, which leads to a functional suspension (dissociation) of brain areas that act together (Kozłowska et al., 2018). Based on this, the article " psychogenic nonepileptic seizures in children and adolescents: Part II – explanations to families, treatment and group outcomes" also highlights explanations if the family wants to understand the subject more accurately (Kozłowska et al., 2018):

The younger parts of the brain (the cortex) are very sensitive to stress and can be disrupted by stress and stress hormones (catecholamines and endogenous opioids). When brain function is disrupted, the parts of the brain that process excitation and emotions – emotion processing regions – become hyperactive, and seem to disrupt motor-sensory programs and cause all sorts of strange motor and sensory symptoms. In Mary's case, she has [describe all the motor and sensory functional symptoms suffered by the child]. Sometimes when there are sudden increases in arousal, the stressed brain is pushed to the limit of its ability. When this happens, the older parts of the brain (the brain stem), which are usually controlled by the cortex, can get out of control, in which case Mary may have a non-epileptic seizure. We know you've never heard of non-epileptic seizures before, but we see children and adolescents with non-epileptic seizures all the time. We saw some children who introduced themselves as Mary. There are many different names for these non-epileptic seizures, so I'm going to write them all down for you. Please be careful if you search for them on the Internet, because adults with this condition do not care very well while children do very well – so you do not want to read things on the Internet that do not apply to Mary. To treat Mary, we'll need to help her learn how to deal with stress and how to better regulate her body and brain's response to stress. This can be difficult at first, and even adults find it difficult to do. But we've had a lot of success with the kids, and we're also going to need to work with your family and Mary's school to try and manage the complicated problems you've raised. (Kozłowska et al., 2018, p. 166)

In sequence, the second part is linked to acute therapeutic intervention, such as psychiatric analyses, which should be considered that only 5% of patients do not have disorders and stressors (Witgert et al., 2005). Based on the treatment strategy, anticonvulsant drugs should also be discontinued unless the individual has had beneficial effects on use.

Therefore, the final part turns to the measures of long-term interventions, which include psychotherapy and drugs for other psychological comorbidities. Among psychotherapy and cognitive-behavioral therapy, the last mentioned has more efficacy (Mayor et al., 2010). In addition to these, psychodynamic therapy can also contribute significantly to the treatment of NECP.

6 CONCLUSION

In fact, it is evident that the convulsive crisis can be confused with the psychogenic crisis due to the similarities between them. Thus, despite the chance of an individual being affected by both, there may be the transfer of erroneous diagnosis and treatment, which can cause serious damage to the carrier, such as adverse effects of anticonvulsant drugs, continuity of events, and impaired quality of life.

Above all, health teams must know decision-making and times when they should suspect PNES. Thus, given any apparent occurrence, it is the professional's role to seek to investigate in detail the individual's life history and refer him to the performance of the EEG, to correctly discard or confirm the diagnosis and offer a resolute treatment.

Depression, anxiety, trauma, and posttraumatic stress disorder can monitor or trigger PNES. Therefore, when the crisis occurs, family members must observe the duration and frequency, in addition to looking for mental comorbidities and situations of the suffering in the daily life of the patient, to help him to deal with such problems.

It is believed that when performing this research, it was possible to expose through this article relevant questions of analysis regarding the signs and symptoms, diagnosis, and treatment of NEPC. Therefore, the resolution of the problem happens when the crisis is identified and treated appropriately, thus, there may be the formation of a bond between patient and family members when reviewing possible traumas and improved attempts to overcome them, ease and knowledge in the decision-making of family members in the face of episodes, reduction of expenses, the better quality of life and engagement in the individual's social environment, and also, the possibility of discontinuity of epileptic episodes of psychogenic origin.

It is understood that the writing of this article may contribute to health professionals, patients, and family members, so that they can understand PNES, as an emotional disease that lacks in-depth analysis with the multidisciplinary team to be diagnosed. In the same way, it is necessary for follow-ups that meet the difficulties experienced by patients.

Bringing this theme to discussion through qualitative and bibliographic research provides knowledge about the PNES and demystifies erroneous understanding of the diagnosis. In addition to promoting other scientific productions on the subject, making this theme more discussed and contributing to the improvement of the lives of patients who have the PNES.

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CHAPTER 77

The Impact of Pandemic COVID-19 on Human Immunodeficiency Virus Patients: A Brief Integrative Literature Review

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ABSTRACT

Objective: To describe the impact of the pandemic of COVID-19 on patients living with human immunodeficiency virus. **Methods:** This is a descriptive and exploratory research; the search for data was conducted through the Virtual Health Library (VHL), SCIELO (Scientific Electronic Library Online), and CAPES Periodicals. For the selection of articles, it was taken into consideration the application of inclusion criteria: publications between 2020 and 2022 and exclusion: publications before the year 2020. **Results:** According to the research carried out it was necessary to do a bibliographic survey on top of the keywords: human immunodeficiency virus, SARS-CoV-2, and CD4, where we saw that many of these articles were related to patients living with HIV/AIDS and that in the isolation period, the same ones for remained without doing some tests such as CD4 and leading, at the same time, the hospitalization of the same ones in the reference units for COVID-19. **Final Considerations:** However, it is not known if the infection by HIV/AIDS associated with low CD4 levels, when not controlled correctly, can lead to a greater risk for SARS-CoV-2, because it is a potent virus.

Keywords: Antigen, CD4; COVID-19; HIV.

1 INTRODUCTION

In December 2019, an unknown SARS-CoV-2 viral infection began in the city of Wuhan, located in China. This Severe Acute Respiratory Syndrome 2, where its main etiological agent is a virus that belongs to the Nidovirales family and the Coronaviridae lineage, having positive ribonucleic acid (RNA) as responsible. The infection caused by this was defined as COVID-19, which has reached more than 27 million people around the world so far, making it a challenging pandemic for the World Health Organization (WHO) and other public bodies of health. health (RODRIGUES; GALLI, 2022; DUARTE¹; QUITANA, 2020).

In Brazil, the scenario was devastating, especially in the face of governments that were oblivious to the situation experienced by all, where social vulnerability made it difficult for people

who experienced the greatest social inequality to have access to health care. Access to health at the moment is not limited to health equipment, but comprises the right established by the organic health law, the Federal Government, State and Municipalities have to guarantee education, food, basic sanitation, housing, among others, and safety. financial support that make it possible to maintain social isolation without government assistance (SILVA; CEIA; TAVARES, 2020; CHIORO et al., 2021).

In September 2020, the country accumulated more than 126,000 deaths from the new Coronavirus , after its contamination and symptoms were confirmed, medical intervention and care carried out immediately had a deadline for satisfactory results, but many of these patients could not go beyond 14 days of treatment. treatment and died. The symptoms were confused with those of a flu or virus, the protocols implemented in the countries took a long time to get off the ground, as it was common to arrive at the health units with fever, cough and fatigue, and diarrhea , dyspnea , hemoptysis, headache and lymphopenia could also occur (TEIXEIRA et al., 2020; SILVA et al., 2021).

After the control measures and protocols signed between the countries and their health regulatory agencies, such as the National Health Surveillance Agency (ANVISA) in partnership with the Ministry of Health and its secretariats in the Brazilian states, it was determined that patients with these symptoms had priority to be tested for COVID-19 and for many of these patients it was too late, as some had age and comorbidities against them even though they left their immune system defenseless (SANTOS, 2021).

Analyzing the relationship between immune response and severe acute respiratory syndrome virus 2 (SARS-CoV-2) infection, the disease that affects immunocompromised people, especially those living with the Human Immunodeficiency Virus (HIV) or the Immunodeficiency Syndrome (AIDS), we know that the HIV virus was discovered in 1983, despite this, the policies implemented still represent an important public health problem in Brazil (ALCOCHETE; CATUMBELA, 2020).

In 2020, there were about 37.7 million people living with HIV, among them 36 million are adults, 1.7 million are children (0 to 14 years old). When talking about gender, 53% of people living with HIV are women and girls, and those living with HIV 84% are aware of their clinical condition. Even so, we have those who did not know that they were living with or that they had HIV, about 6.1 million people. In the current scenario, the COVID-19 pandemic, social isolation had to be carried out, which made it difficult for this population at risk to access health services, thus hampering the diagnosis of new cases and the monitoring of seropositive individuals (UNIDAS, 2022).).

Coronavirus pandemic , a more careful and targeted look at people living with HIV/AIDS should be taken, considering the clinical implications of COVID-19 that may have on the health of this immunologically vulnerable population. In addition, it is necessary to count the cluster of differentiation 4 or cluster of differentiation (CD4) which will measure the amount of lymphocytes present in the body. In Brazil, these tests are free, and the population had access to them, and the expected results can demonstrate

the stability of the infection are those in which CD4 cells are in large numbers (COSTA SOUZA et al., 2020).

Faced with the clinical picture of several of the patients affected by the HIV virus, and with this arrival of a new virus such as SARSCoV-2 highly destructive with apparent symptoms of a common flu. This new virus has thrombolytic action in blood vessels and arteries, which lead to pulmonary and coronary complications. In this context, there was curiosity to know how patients living with HIV are dealing with the COVID-19 pandemic, and whether there have been sudden changes due to a new infection associated with the HIV virus. Since CD4 cells are highly immune cells, where they have the function of fighting the invaders that are active during their mutation by the acquired syndrome and at the same time the bone marrow has to redouble its production of defense cells.

The aim of this study is to describe the impact of the COVID-19 pandemic on patients living with the human immunodeficiency virus.

2 METHODS

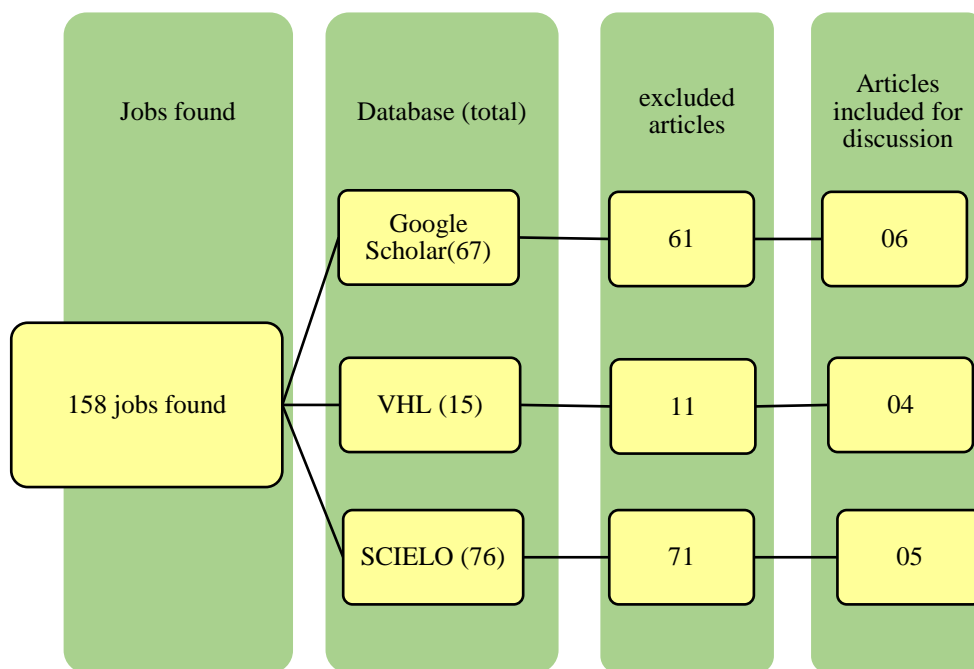
This is a descriptive and exploratory research, in the form of integrative review. Data collection took place in a virtual way, with a search for articles in databases such as: Virtual Health Library (BVS), SCIELO (Scientific Electronic Library Online), CAPES Periodicals (Coordination for the Improvement of Higher Education Personnel) and university websites that contained published scientific works.

For the selection of articles, the application of inclusion criteria was taken into account: publications between 2020 and 2022, full-text articles, publications in Portuguese and English, free of charge and that met the objectives of the integrative review. Exclusion criteria: publications prior to 2020 and unpublished articles.

3 RESULTS & DISCUSSION

The results obtained since the initial search were 158 articles in the following bases: Virtual Health Library (VHL), Google Scholar, *Scientific Electronic Library* (SCIELO), which contained published scientific works. Referring to the years 2020 to 2022, where we apply inclusion and exclusion criteria through careful reading to carry out the selection of publications.

Figure 1 : Flowchart of selection and inclusion of articles in the review.



Source: Prepared by the author, 2022.

In Google Scholar, 67 articles were initially found, after applying the inclusion and exclusion criteria, 06 articles corresponding to the theme were used. In the VHL platform initially 15 articles were obtained, after applying the inclusion and exclusion criteria, only 04 articles corresponding to the theme were used. Initially, 76 articles were found on the SCIELO platform, after applying the inclusion and exclusion criteria, it was found that the articles with titles referring to the topic were repeated on the other platforms, therefore, we obtained 05 articles used.

Therefore, the selected articles totaled 11 articles, which will make up the discussion of the present study. As described in **Table 1**.

Table 1 - Categorization of research according to author/year, title, methodological bases, results and conclusion.

AUTHOR/YEAR	TITLE	BASES METHODOLOGICAL	RESULTS	CONCLUSION
ALVES et al., 2021.	Clinical consequences of COVID-19 in people with HIV/AIDS: an integrative literature review	Integrative Literature Review	The clinical picture presented by the patients coinfectad with COVID-19 and HIV did not show differences when compared to patients without HIV. It was observed that other comorbidities influenced consequences of the clinical course of patients, regardless of the	Some of the data that showed the greatest discrepancy, such as the high mortality rate, younger than usual age, and the presence of severe dyspnea symptoms, can be justified by the high prevalence of comorbidities in the analyzed population. Therefore, it cannot be said that these characteristics presented by patients

			co-infection with HIV. Thus, the results showed discrepancies, not making it possible to evidence the clinical worsening of COVID-19 by the presence of HIV.	are exclusively derived from HIV infection.
BARBOSA, 2022.	DEVELOPMENTS OF THE IMMUNOLOGICAL RESPONSE TO HIV VIRUS INFECTION: A SYSTEMATIC REVIEW	Descriptive Study	Defense mechanisms against HIV infection begin with the entry of the virus through the epithelial barrier, mediated by chemokine receptors CCR5 and CXCR4 and the cell surface molecule CD4.	Opportunistic infections that occur in HIV/AIDS patients are mainly related to the depletion of CD4+ T lymphocytes caused by the virus.
DAYS, 2022.	Vaccines to combat COVID-19: their differences related to forms of production, immune response and efficacy	Comparative Method	In addition to the form of vaccine production, this study also aims to point out the characteristics of the SARS-CoV-2 virus, such as its viral structure and its mode of replication and dissemination, so that a better understanding of the disease and its etiological agent can be achieved.	The scale of the economic and humanitarian impact caused by the SARS-CoV-2 virus pandemic were the main reasons for creating vaccines in a speed never seen before, when we talk about vaccines; More than 175 research teams around the world were mobilized to study several possibilities of vaccines and technologies involved in their production.
FALAVIGNA et al., 2022.	Brazilian guidelines for the pharmacological treatment of hospitalized patients with COVID-19: Joint guideline of the Brazilian Association of Emergency Medicine, Brazilian Association of Intensive Medicine, Brazilian Medical Association, Brazilian Society of Angiology and Vascular Surgery, Brazilian Society of Infectious Diseases, Brazilian Society of Pulmonology and	Descriptive Study	16 recommendations were generated. These include strong recommendations for the use of corticosteroids in patients on supplemental oxygen, for the use of anticoagulants in prophylaxis doses for thromboembolism, and for not using antibacterials in patients without suspected bacterial infection.	To date, few therapies have proven effective in the treatment of hospitalized patients with COVID-19, with only corticosteroids and prophylaxis for thromboembolism recommended. Several drugs were considered ineffective and should be discarded, in order to offer the best treatment based on evidence-based medicine and to promote the economy of ineffective resources.

	Tisiology and Society			
FERREIRA; SANTOS, 2022.	Building nodes: parallels and lessons between HIV/AIDS and COVID-19 from the analysis of semantic networks on Twitter	Quantitative-qualitative method of semantic network analysis	As a result, we identified the political-partisan polarization of comments about COVID-19 and HIV/AIDS on Twitter, the re-emergence of stigmas associated with specific groups, such as homosexuals and Asians, and the large-scale spread of misinformation about the two diseases, revealing a field of tensions and narrative and media disputes as a ' necropolitics ' tool.	Our theoretical and empirical trajectory allowed us to arrive at some considerations. The posts by Brazilians about HIV/AIDS and COVID-19 in April 2021 indicate that discussing, in this case, public health in the Brazil is also talking about (necro)politics, stigma and excessive circulation of (mis)information on websites and social networks.
GONÇALVES et al., 2021.	Analysis of the release of NETs by neutrophils from people living with HIV, and their effect on the replication of HIV-1 in macrophages	Field research.	High levels of DNA-elastase complexes in plasma were observed, which correlate positively with the concentration of circulating LPS, and that neutrophils from these individuals are able to release NETs in vitro upon activation with IL-8 and TNF- α . This suggests that HIV-1 infection enhances the formation and circulation of NETs and that microbial translocation may contribute to this phenomenon. It was also observed that NETs reduce viral replication in macrophages infected in vitro by HIV-1 and that recombinant myeloperoxidase is able to reproduce this inhibition. Furthermore, a reduction in the integration of the viral cDNA into the host cell genome	These results, therefore, indicate the participation of NETs in the pathophysiology of HIV-1 infection.

			was observed, which explains, at least in part, the inhibition of replication by the NETs .	
KREWER et al., 2022.	Rhodococcus Equi	Descriptive Study.	It has three levels of virulence according to the different antigens expressed on its surface. Virulent strains have a plasmid encoding the surface protein VapA and are mainly isolated from foals with pneumonia and from some human patients. Strains with intermediate virulence express the VapB protein and predominate in swine and humans with AIDS.	In the last decade, important advances have been made in understanding the mechanisms used by R. equi to proliferate in the host. Currently, research has focused on identifying the molecular bases used by R.equi .
RODRIGUES; GALLI, 2022.	Pathophysiological analysis of clinical respiratory manifestations in people infected with the SARS-CoV-2 virus.	Descriptive and Qualitative Integrative Review.	The results found indicate that the pathophysiological changes manifested in SARS-CoV-2 infection have characteristics closely similar to those found in severe acute respiratory syndrome (SARS - CoV) and middle east respiratory syndrome (MERS-CoV), which are triggered by other pathogens of the coronavirus family .	It is concluded that we are dealing with a specific type of pneumonia that has a progressive and fatal involvement, leading to the destruction of pulmonary structures essential for the diffusion of gases (hematosis).
NAPOLEÃO et al., 2021.	COVID-19: Understanding the “Cytokine Storm”	Literature revision.	In some individuals, the exacerbated response of the immune system causes the hyperstimulation of its defense cells, causing hyperinflammation due to the storm of pro-inflammatory cytokines (TNF- α , IL-1- β , IL-6, IL-12 and chemokines). This hyperinflammation	It is concluded that elevations in serum levels of pro-inflammatory cytokines are usually present in severe COVID-19. However, more studies are needed to establish differences between patients with COVID-19 who develop a protective and balanced inflammatory reaction from those who develop an exaggerated inflammatory reaction, with a consequent

			characterizes the pathophysiology of severe COVID-19, which causes pathological changes mainly in the lungs, being a predictor of disease severity due to the strong association with multiple organ failure, which can lead to death.	pathological cytokine storm. Keywords: SARS-CoV-2, COVID-19, cytokines.
WOLDAY; NDUNGU; GÓMEZ-PEREZ; WIT, 2021.	Chronic Immune Activation and CD4+ T Cell Lymphopenia in Healthy African Individuals: Perspectives for SARS-CoV-2 Vaccine Efficacy	Descriptive Review.	It is characterized by increased levels of soluble immune activation markers, such as the cytokines interleukin (IL)-4, IL-10, TNF- α , and cell activation markers, including HLA-DR, CD-38, CCR5, along with with naïve reduction and increase in memory cells in the CD4+ and CD8+ subsets. Furthermore, it is accompanied by low CD4+T cell counts when compared to Europeans. There is also evidence that mononuclear cells from African babies secrete less innate cytokines than South and North Americans and Europeans in vitro.	Finally, we strongly recommend that highly prevalent infections such as those discussed in this manuscript be controlled in future vaccine trials, not just for SARS-CoV-2 infection, to assess the true magnitude of the impact of these conditions on vaccine efficacy, to guide the design of vaccines adapted for Africa, if necessary.
PEAR TREE; GIR; SANTOS, 2021.	People living with HIV and changes in daily routine resulting from the COVID-19 pandemic	Qualitative research.	Different changes were identified in the daily routine of people living with HIV resulting from the COVID-19 pandemic, among them, the use of preventive measures, such as the use of masks and social isolation, in addition to changes in the work and leisure environment, in the family life, individual	Many changes and challenges of a physical, biological and psychosocial nature have been shown to be experienced by the participants in the face of the pandemic world scenario, resulting mainly from social isolation. To this end, coping strategies become fundamental in the daily lives of people living with HIV in order to ensure continuity and uninterrupted treatment, and the prevention of a pandemic, thus

			emotional aspects and treatment.	mitigating the repercussions of COVID-19 on the health of these individuals. who belong to the risk group.
SANTOS et al., 2022.	Relationship between SARS-CoV-2 infection and the occurrence of thromboembolic events	Literature revision.	Although hospitalization and, especially, help in the ICU, by itself, are factors of greater risk for thromboembolism, it is observed that the processes of thrombogenesis are patients tend to be more prevalent in the face of Invasion by SARS-CoV-2, especially the storm storm. cytokines due to the virus, with emphasis on the release of interleukin 6, tumor necrosis factor and chemokines , which provide the capacity for the coagulation cascade of the hypercoagulable state.	However, the risk factors and pathophysiological mechanisms associated with thromboembolism have not yet been fully elucidated, gaps that should be thoroughly researched by future scientists to assist in the understanding of studies such as better diagnostic , therapeutic and prophylactic complications.
SILVA et al., 2021.	COVID-19: Health professionals in in-hospital patient care COVID-19: Health professionals in in-hospital patient care	Reflective descriptive review.	Even so, when we need to carry out these transfers, the help of qualified professionals is necessary to preserve the patient's life, and allows professionals to have greater control of risk situations, in addition to conducting treatments and detecting future unwanted complications.	However, it is expected that such evidence will collaborate to support strategies aimed at training these professionals, both during the training period and during the services that were assigned to them, in order to improve the quality of care provided to the patient in the intra-hospital situation. hospital.
OLIVE TREE; MARQUES, 2020.	The panacea of anticoagulants in COVID-19 infection	Literature review.	However, despite the growing network of research that has been created around COVID-19, it is noted that most of these studies have weak evidence, as what we have so far	Knowledge about the response of this disease to any type of treatment suggested is extremely volatile with daily renewal of concepts, requiring a lot of criteria and parsimony in the conduct, always trying to keep in mind a

			are, in general, guidelines from societies of specialties, expert opinions, in vitro studies, case reports and some case series (with a small sample size).	palpable and solid scientific basis so as not to cause harm to the patient. .
STURZA; TONEL, 2020.	The challenges imposed by the COVID-19 pandemic: from measures to protect the right to health to impacts on mental health	Literature review.	It was found that isolation, the constant fear of illness and the threat of unemployment cause immeasurable damage to the mental health of the population.	The main contribution of this research lies in the possibility of reflecting and asking about the various issues relevant to the unfortunate spread of this new coronavirus, which has been leading a rigorous health and humanitarian crisis, with damage to the right to health, individual and collective freedoms. and people's livelihoods.

Source: Prepared by the author, 2022.

According to Alves et al. (2021), the pandemic brought with it a care network to work directly with infected people during social isolation. It is essential to work on the principle of integrality and interdisciplinarity with the expectation of satisfactory results for this population at risk. It is of paramount importance to have CD4 cell counts below the reference number (< 500 cells/mm³ of blood), that is, immunosuppressed clients, who have some advantages of SARS-CoV-2 infection.

For Barbosa (2022), the COVID-19 pandemic had a large participation of empirical actions and interventions and based on findings, often exclusively derived from in vitro tests, which showed the intense release of pro-inflammatory cytokines, responsible for the worsening of the clinical picture of patients with COVID-19.

Dias (2022), comments that the treatment was often out of control, and the search to treat with effective drugs was usually dubious, even so, the treatment is arduous and needs to follow the treatment protocols. The medical procedure of clinical decision, which is usually guided by a rational approach, based on evidence, becoming clearly emotional.

Falavigna et al. (2022), describes that the pharmacological treatment of hospitalized patients with COVID-19 and the HIV virus is highly complex because we are treating different pathologies that have in common attacking the CD4 of these immunosuppressed patients. The target population has indications for hospitalization in cases of diagnosis or suspicion of COVID-19. We know that the demand during the crisis was intense and led to the death of these patients who lived with the HIV virus.

Ferreira & Santos (2022); KREWER et al. (2022), reports that COVID-19 can have a cure through biosecurity measures, including all the necessary guidelines to combat the opportunistic

pathologies of HIV/AIDS. This can also lead to another situation that is not visible, which is depression, due to the few acceptable cultural and social advances to overcome social exclusion and the historical stigma of the disease.

Gonçalves et al. (2021), comments that the appreciation of the release of neutrophils from people living with HIV/AIDS, exists between, one or another, variation with symptoms and characteristics that do not fit among the diagnoses of pneumonia directly, however, it is a characterized form. diagnosis that is usually infected by *Mycoplasma Pneumoniae*, from which place, according to the symptoms, it presents pain in the lung base, reported by the client as back pain, and absence of secretion.

Rodrigues & Galli (2022) report that the respiratory system is the main organ affected, according to studies published in scientific databases, which identified the relationship of some pathologies such as influenza associated with clinical manifestations and in different body systems. human associated with SARS-CoV-2, such as: cardiovascular, digestive and central nervous system.

Napoleon et al. (2021), says that the invasion of pathogens, known as: viruses, bacteria and fungi, is fought by two major defenses of the immune system: an initial defense, conducted by innate immunity; and a later one, mediated by acquired immunity. However, this initial innate defense can prevent the entry of invaders into the body, using physical barriers such as: skin and mucous membranes of the respiratory and gastrointestinal tract and antimicrobial peptides, secreted by epithelial cells and by some leukocytes.

COVID-19 patients living with the HIV virus also have lymphopenia. Low baseline CD4 cell counts of generally African individuals will increase the acuity risk of COVID-19. Immune triggering in Africans is associated with environmental factors such as parasitic infections, other infections and vaccines. It is unclear whether the immunogenicity and efficacy of anti-SARS-CoV-2 vaccines will also be reduced by similar cell defense mechanisms (WOLDAY; NDUNGU; GÓMEZ-PÉREZ; WIT, 2021).

According to Pereira, Gir & Santos (2021), the control measures together with social distancing were the biggest move in history to mitigate the damage caused by the COVID-19 pandemic. However, Santos et al. (2022), comments that HIV needs regular monitoring and biannual monitoring of CD4 rates and viral load, seeking the necessary medications to continue treatment, in addition to dealing with opportunistic HIV diseases.

According to Silva et al. (2021), hospitalizations during the pandemic period brought with them the imminent fear of death, and even with all the correct care and treatments to maintain the survival of these clients living with HIV, it was not possible to keep everyone alive, as the disease is overwhelming, and brought with it terror in the country's intra-hospital units.

Sobreira & Marques (2020), corroborate Sturza & Tonel (2020), when they say that social isolation was necessary for the prevention and control of infection by the COVID-19 virus; still, they

wonder if “it was good for whom” many people believe that the quarantine constitutes an unwarranted decrease in personal freedom, while on the other hand the uncertainties of the labor market, where many have lost their jobs and their housing. The economic and financial impact in general was considered a major contributor to the increase in psychological disorders, evidencing the negative effects on the mental health of these individuals, even post-quarantine.

4 FINAL CONSIDERATIONS

Serum positive patients who have been contaminated by COVID-19 will suffer not only from physiological damage, but also from their emotional structure that has been totally shaken, such as seclusion, lack of care and loneliness. This scenario of a new infection challenged our seropositive patient to be more aware of their own health. However, these individuals had their lives interrupted due to numerous cases of SARSCoV-2, where their families did not have the right to watch over that body.

COVID-19, without a shadow of a doubt, has brought insecurity and uncertainty for tomorrow, it has certainly been causing devastation in the world and we have to deal with the situations imposed by our rulers, where it suffocates, social inequalities and the overlap of the economy and of profit on human life. However, it is not known whether HIV/AIDS infection associated with low CD4 levels when not properly controlled can lead to a greater risk for SARSCoV-2, as it is a potent virus, for this reason, it is necessary to have all hygiene care and have the habit of wearing masks even if released by the health authorities of our country.

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CHAPTER 78

Assessment of knowledge in online mediation in distance higher education

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ABSTRACT

Distance higher education in Brazil has been challenged to integrate this new educational process with a body of education professionals, including the face-to-face tutor and the distance tutor. This work discusses the distance tutor, the objective is to evaluate the knowledge of the online mediation of the distance tutor in higher education. The relevance of this study is related to the need to evaluate the tutor's work during and after their performance and what needs to be improved. The distance tutor with the use of tools and artifacts performs the online mediation of the student's learning through the virtual learning environment. It is asked, therefore, what knowledge

does the distance tutor need to appropriate to carry out this educational work in distance higher education? In the cross-sectional and descriptive research, the data had a quantitative approach. Developed from the theoretical framework in relation to attitudinal, conceptual, and procedural knowledge (COLL,1998). It was observed that the research in the final model provided by the multiple regression and comparing the standardized coefficients β , presented in the conceptual dimension greater weight in the composition of the grade of the evaluation scale ($\beta = 0.529$), it was understood that the conceptual knowledge is well represented in the assessment of students towards tutors. As for the attitudinal knowledge, it reached a level of ($\beta = 0.319$), signaling a median line between the knowledge, which is conceived that the degree of motivation is above average relative to the results of conceptual knowledge. Procedural knowledge was below average than conceptual knowledge, at a level of ($\beta=0.233$). The results showed that this level reveals that although the tutor receives everything ready, the methodologies and didactic strategies must be more intensified, as they need to mediate with regard to adequate language, more intensified online social presence in the virtual learning environment, with activities of targeted learning and diagnostic, formative and continuous assessment activities that regulate student learning.

Keywords: Evaluation. knowledge. Online mediation.

1 INTRODUCTION

The technological revolution has caused changes in the way of learning and teaching, with the emergence of distance education courses in the various educational institutions of our country in higher education. This new way of learning and teaching was regulated in the distance education modality (DE) through the Education Guidelines and Bases Law - Law 9,394, of December 20, 1996, which advocates in its article 80, the use of this modality at all levels and modalities of education.

The cited article was regulated by Decrees 2494 of February 10, 1998 and Decree 2561 of April 27, 1998, both revoked by Decree 5622 of December 20, 2005, and this was revoked by Decree 9057 of May 25, 2005 in force that governs the quality assurance policy with the Ministry of Education, which recognizes (DE) as an educational modality, with legal apparatus in relation to management, planning, implementation,

accreditation, disaccreditation, operation, supervision, monitoring and offer and evaluation of courses the distance in the national territory in all levels and modalities of education that follows the citation of its article 11 § 2 “The accreditation of a higher education institution is allowed exclusively for the offer of undergraduate and postgraduate courses *sensu* in the distance modality” and takes the opportunity to mention Ordinance 275 of December 18, 2018, which provides for *stricto sensu* graduate programs in the modalidade the distance.

Distance higher education is supported by the Quality References for Distance Higher Education (RQESAD), regulated by the Distance Education Department in August 2007, which below transcribes the topics of the quality references for distance higher education:

- (i) *Conception of education and curriculum in the teaching and learning process;*
- (ii) *Communication Systems;*
- (iii) *Teaching material;*
- (iv) *Evaluation;*
- (v) *Multidisciplinary team;*
- (vi) *Support infrastructure;*
- (vii) *Academic-Administrative Management;*
- (viii) *Financial sustainability.*

Item (V) Multidisciplinary Team that regulates the presence of education professionals working in this modality is highlighted with the following content:

In distance education, there is a diversity of models, which results in different possibilities for the composition of the human resources necessary for the structuring of courses in this modality. However, whatever the option established, human resources must set up a multidisciplinary team with the functions of planning, implementing and managing distance courses, where three professional categories, which must be in constant qualification, are essential for a quality offer. : teachers; tutors; technical-administrative staff. (RQESAD, 2007).

Distance higher education in Brazil has been challenged to integrate this new educational process with a body of education professionals, including the face-to-face tutor and the distance tutor. In this work, the distance tutor is discussed, the objective is to evaluate the knowledge of the distance tutor's *online mediation*. The relevance of this study is related to the need to evaluate the tutor's work at a distance, during and after their performance in what needs to be improved. This assessment allows institutions to combine efforts to monitor the performance and implementation of continuing education so that the distance tutor can act effectively.

The distance tutor using digital tools and artifacts performs the *online mediation* of student learning through the virtual learning environment. It is asked, therefore, what knowledge does the distance tutor need to appropriate to carry out this educational work in distance higher education?

2 CONCEPTION OF KNOWLEDGE IN ONLINE MEDIATION

It is observed that to carry out this educational work, the tutor needs knowledge and it is verified that there is a need for the distance tutor to position himself through the pillars of knowing how to be, knowing how to know and knowing how to do. Finally, adopt the posture of being in the learning process. Belloni (2001, p.85), confirms that “To face this new situation, the teacher will have a very strong need for constant updating, both in their specific discipline and in relation to teaching methodologies and new technologies”. Several authors carry out this discussion of knowledge in which Farias et al (2008, p.73) are cited and contextualize that the

Synthesis of existing categorizations of teaching knowledge: professional training knowledge, disciplinary knowledge, curriculum knowledge, experience knowledge; knowledge of Educational Sciences, knowledge of the pedagogical tradition, experiential knowledge, knowledge of pedagogical action, attitudinal knowledge, critical-contextual knowledge, specific knowledge, curricular didactic knowledge, knowledge of knowledge.

It is conceived that for this study it is considered that the performance of the distance tutor is constituted in the knowledge of the attitudinal, conceptual and procedural dimension based on the studies of Coll *et al* (1998).

Mediating learning in the virtual learning environment in the attitudinal dimension is a motivational action in which the distance tutor seeks to awaken in the student the desire to learn, to study, to attend the discipline, to continue in the course. This motivation contributes to the virtual solitude being disarticulated and the student can feel the sign of belonging and come to interact with the tutor at a distance, with the course colleagues with the tool, with the didactic material in the construction of the knowledge of the subject he is studying. .

Coll et al (1998, p. 122) assures that attitudinal knowledge is “an enduring organization of motivational, emotional, perceptual and cognitive processes in relation to some aspect of the individual's world”. In this it can be observed that the attitudinal knowledge is integrated in a humanizing, educational and emancipating process that encompasses the motivation, emotion, perception and cognition of the student and the distance tutor. It becomes a two-way relationship in which the tutor learns and teaches.

But to work in distance education, conceptual knowledge is also highlighted in Coll *et al.* (1998, p.132) admits that “The more intertwined is the network of concepts that a person has about a given area, the greater will be his/her ability to establish meaningful relationships and, therefore, to understand the specific facts of that area”. Conceptual knowledge is constituted by the pedagogical foundations that involve the domain of pedagogical, didactic and technological concepts mediated via *online that* become essential for the monitoring, regulation and evaluation of the student's learning.

In the online mediation of the distance tutor, the procedural knowledge that Coll et al (1998, p.77), evokes that “the set of actions or decisions that make up the elaboration or participation is what we call procedure” is still present. Procedures are represented by “habits, techniques, skills, methods and routines”.

The procedural knowledge integrates the didactic knowledge, the curricular knowledge, the knowledge of the experience, the know-how that involves the methodologies and the strategies that guide the pedagogical practice via online.

Procedural knowledge consists of discovering how the student learns, as each one has their own learning style and, in this way, acquire strategies that reach the students in a collaborative way; procedural knowledge is concerned with planning which contents promote the construction of knowledge, sensitizes itself in the use of adequate tools and artifacts to carry out effective mediation so that the student in the virtual learning environment can learn and apprehend the contents for their academic formation and human formation.

3 METHODOLOGY

The study refers to an excerpt from the master's thesis, whose research was carried out at the Federal University of Ceará (UFC) in the academic unit, the Instituto Universidade Virtual, in undergraduate courses in the distance education modality, with data collected through a tutorial evaluation instrument in which students in the virtual learning environment through the SOLAR System, evaluated the knowledge of the distance tutor's performance.

Gonçalves (2003, p.14) comments that “research in terms of objectives is classified as exploratory, descriptive and explanatory research”. The research had a transversal and descriptive nature and the data had a quantitative approach, in which Silva and Silveira (2007, p.148-151), evoke that “the quantitative research aims to measure numerically or statistically the phenomena”.

The object population of the study consisted of students enrolled in the 2011.1 academic semester in undergraduate courses in the distance education modality at the Virtual University Institute of the Federal University of Ceará. The sample was constituted by the random selection of 07 (seven) courses among those offered by Instituto Universidade Virtual in the academic semester 2011.1; and involved 1957 students, 175 tutors, 26 disciplines, 7 undergraduate courses, in 27 centers located in the State of Ceará.

Data collection was carried out through a tutorial assessment instrument that consisted of a questionnaire with 16 closed-answer questions (multiple choices and items on a *likert scale* with items agree, disagree, partially agree) developed from the theoretical framework of the study in relation to attitudinal, conceptual and procedural knowledge (COLL et al,1998).

4 RESULTS

The data obtained from the research were submitted to a multivariate analysis that, through the measurement of the *likert scale*, one can evaluate the tutor's knowledge at a distance. hair *et al* (2005, p.32) mention that “the objective of multiple regression is to predict changes in the dependent variable in response to changes in the independent variables”. In this study, the tutor is constituted as a dependent variable and

knowledge as independent variables in which the result of the knowledge scores attributed by the students evaluated the degree of changes in which the distance tutor needs to make to act effectively.

4.1 ANALYSIS OF RESULTS

Table 1 - Models obtained in the multiple linear regression

		Non-standardized coefficients		standardized coefficients		
Model		B	standard error	Beta	t	Sig .
1	(constant)	,758	,049		15,419	,000
	noteD2 - Note in dimension 2 - CONCEPTUAL - Scale [0 ; 10]	,899	,006	,958	147,228	,000
two	(constant)	,808	,032		25,347	,000
	noteD2 - Note in dimension 2 - CONCEPTUAL - Scale [0 ; 10]	,632	,006	,673	97,471	,000
	gradeD1 - Grade in dimension 1 - ATTITUDINAL - Scale [0 ; 10]	,284	,005	,359	51,997	,000
3	(constant)	,072	,022		3,242	,001
	noteD2 - Note in dimension 2 - CONCEPTUAL - Scale [0 ; 10]	,497	,004	,529	113,369	,000
	gradeD1 - Grade in dimension 1 - ATTITUDINAL - Scale [0 ; 10]	,253	,003	,319	78,123	,000
	noteD3 - Note in dimension 3 - PROCEDURAL - Scale [0 ; 10]	,242	,004	,233	61,443	,000

Dependent variable: note_ATD – Tutor assessment score - Scale [0 ; 10]
SPSS 15.0 font

Observing Table 1, in the final model 3 provided by the regression and comparing the standardized coefficients β , it is verified that the conceptual dimension had greater weight in the composition of the evaluation scale grade ($\beta=0.529$), it is understood conceptual knowledge is well represented in the students' assessment of the tutors. As for the attitudinal knowledge, it reached a level of ($\beta = 0.319$), reaching a median line between the knowledges, which is conceived that the degree of motivation is above average in relation to the results of conceptual knowledge.

Procedural knowledge was below the average that conceptual knowledge presented, at a level of ($\beta =0.233$). This level reveals that didactic methodologies and strategies should be further intensified, because

although the distance tutor receives the ready-made didactic material and the virtual learning environment, he still needs to mediate with adequate language, targeted learning activities, a more intensified online social presence. in the virtual learning environment, either in the forums in the discussions of the themes studied, and in assessment activities that are diagnostic, formative and continuous and that regulate learning, so that mistakes, doubts, are worked on and reversed in new learning.

4.2 GENERAL CONSIDERATIONS

The study showed that the distance tutor needs to appropriate conceptual, attitudinal and procedural knowledge to carry out online mediation in blended education, thus answering the question.

The study showed that conceptual, attitudinal and procedural knowledge can be used as criteria for the evaluation of the distance tutor, since evaluating the distance tutor is a complex activity and the theme requires continuity in new research to accompany the development, the performance of the distance tutor through the knowledge built in their online pedagogical practice.

The theme instigated the deepening of a new look at contemporary education with regard to empowerment in educational relationships, aiming in this way that the means and ends are directly linked to the construct of this phenomenon that is Distance Education that appears in education as a transformation movement in the learning and teaching process and in the distance tutor training itself, both in academic and continuing education and in their pedagogical practice.

The knowledge investigated was presented in a different way in the research, and it is important to pay attention to the procedural knowledge that involves the distance tutor's know-how and that denotes the need for continuing education so that they can deepen their pedagogical practice in the virtual learning environment with strategies and effective methodologies.

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CHAPTER 79

Stratification and proper pain management

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ABSTRACT

Pain is a potential risk to public health, it is characterized by a multidimensional experience associated with physical and emotional aspects. Pain warns of danger and avoids organic damage, but when it is impossible to perform daily activities and impacts the patient's life quality, it is classified as pathological and requires medical interference. The following article aimed to describe, through a narrative literature review, aspects related to pain and its proper management. Pain is a broad complex that is classified according to location, type, intensity, and periodicity. The categories referring to pain are nociceptive, neuropathic, and psychogenic. In addition, pain syndromes are diverse and can affect any system of the body. Emphasizing that it is essential to categorize as much information as possible to properly conduct the treatment of these diseases.

Keywords: health education, pain, painful syndromes.

1 INTRODUCTION

Pain is an unpleasant sensory and emotional experience adjacent to any actual or potential tissue damage. Classified as subjective and personal, and associates sensitive and cultural factors that can be modified by sociocultural variables and psychic aspects of being and the environment (Azevedo, 2018).

The painful sensation should not be synonymous with harm, but an alarm that something in the body is not right. Pain is an adaptive mechanism that enables that eventual disorders are avoided and identified before they result in sequelae and progress to chronicity. However, when the pain persists, it becomes unbearable and reaches a state of hampering daily activities must be properly investigated and treated more intensively (Camilo, 2020).

The following article aimed to describe, through a narrative literature review, the main aspects related to pain and its proper management.

2 METHODOLOGY

This is a qualitative narrative review study, appropriate to discuss the state of the art of a given subject. It consists of a comprehensive analysis of the literature, without establishing a rigorous and replicable methodology at the reproduction level of data and quantitative answers to specific questions, as explained by and (2014).

This methodology was chosen because it is fundamental for the acquisition and updating of the knowledge on a specific topic, highlighting new ideas, methods and subthemes regardless of the emphasis in the selected literature.

Because it is a bibliographic analysis on the theory of mind and the understanding about of this competence in the adult individual, articles indexed in the of data Brazilian Society for Pain Studies (SBED),⁹ Scientific Electronic Library Online (SciELO), Capes Periodicals, Virtual Health Library (VHL), Literature Latin America in Health Sciences (LILACS), Medical Literature Online (MEDLINE), Education Resources Information Center (ERIC), Brazilian Society of Anesthesiology (SBA) and Brazilian Society of Neurology (SBN) during the month of July 2022, with the last 5 years as the reference period.

The indexing terms or descriptors were used: signs and symptoms, pain, pain clinics, alone or in combination, without delimiting a time interval.

The criterion used for the inclusion of publications was to have the expressions used in the searches in the title or keywords, or have it explicit in the abstract that the text relates to the association of theory of mind with aspects linked to the adult individual. the articles excluded did not meet the established inclusion criteria and/or had duplication, that is, publications retrieved in more than one of the databases. Dissertations and theses were also excluded.

After the target information had been retrieved, initially, the reading of titles and abstracts, with no exclusion of publications at this stage. Subsequently, the complete reading of the 31 texts was carried out. As axes of analysis, initially sought to classify the studies as to the particularities of sampling,

bringing together those whose samples approach concepts and physiological with development normative or neurotypical; and those whose samples are clinically affected, symptomatological and therapeutic picture. From there, the analysis of the theoretical foundation of the studies, as well as the observation of the general characteristics of the articles, such as year of publication and language, followed by their objectives. Finally, performed if the appreciation of the applied methodology, results obtained and discussion. Specifically, to analyze the scientific production identified, qualitative techniques were not used and/or specific quantitative data processing, with the analysis of each one of the texts.

3 RESULTS AND DISCUSSION

The search for the articles that composed this study identified 255 references about stratification and adequate pain management in the aforementioned databases, of which 31 publications were included in the review. Among the selected studies, 28 articles present theoretical approach, 3 are case studies. There was a prevalence of publications in the English language, representing 84% of the total, when compared to the languages Spanish (9.6%) and Portuguese (6.4%).

During the present study, numerous review articles were found who discussed aspects related to stratification and adequate pain management. This one This fact possibly reflects the importance that this topic has for clinical medicine and the prognosis of the patient, which group the existing research related to the topic, a since these publications are very numerous, it allows for greater dissemination of information for the community and health professionals.

4 PAIN PHYSIOLOGY

A stimulus is detected from the sequence of four processes: transduction, transmission, modulation and perception. Transduction takes place at peripheral endings of primary afferent neurons, where different forms of energy (mechanical, thermal or chemical) are transformed into electrical action. The transmission is based on the direction of the electrical stimulation by the nervous system. Modulation is the phenomenon to which neural action can be modified along the transmission, and occurs preferentially in the column back of the medulla. Then perception takes place in supraspinal structures related in somatosensory chaining (Ferrari, 2021).

5 COMPONENTS OF PAIN

The phenomenon of pain encompasses four compounds which are nociception, pain, suffering and typical behaviors. Nociceptors are sensory nerves, which contain specialized free nerve endings. They are located in the skin, muscle, joints, viscera and dura mater, in addition to the fascia and adventitia of blood vessels (Azevedo, 2018).

Initially, tissue injury is detected by transducers associated with the A delta and C fibers that send signals to the dorsal horn, a process called nociception. This is usually triggered by sufficient mechanical, thermal or chemical forces. to cause some damage (Azevedo, 2018).

The reaction to nociception is pain. It is produced in the spinal cord and in the brain by nociceptive afferents. Neuronal bodies synthesize neuropeptides, substance P and CGRP (Calcitonin Related Peptide Gene), these induce vasodilation, plasma extravasation, macrophage recruitment, mast cell degranulation or other events that trigger inflammation neurogenic (Matias, 2022).

The conscious perception of pain takes place in the reticular formation of the brainstem, thalamus and other parts of the brain. Emphasizing the essential role of the cortex in interpretation of the painful quality. The primary somatosensory cortex points to location and level, while the secondary is associated with the

recognition of stimuli pain and thermal pain, experience related to pain and aggregation between tactile and nociceptivos (Cardinot, 2020).

Suffering in the face of pain leads to typical painful behaviors that are grimaces, groans, changes in gait, indisposition and the search continues for medical assistance.

This behavior is the result of environmental antecedents and implications. That is, these are important, but the investigation of the base factor should be prioritized (Azevedo, 2018).

The modulation process is descending connections between brain centers upper limbs and the spinal cord, which can amplify or inhibit the impulse of signals painful. This event justifies why pain is characterized as something subjective and individual. Emphasizing that triggers such as attention, sociocultural beliefs, state Cognitive and emotional can determine how each person describes their own pain condition (Cardinot, 2020).

6 TYPES OF PAIN

Clinical concepts that help define the quality and character of pain are acute or chronic; diffuse or localized; pulsatile or continuous; deaf or colicky; in burning, tingling, stabbing, searing; sharp or painful; constant or intermittent; emergent or incident (Matias, 2022).

The acute pain is the result of an organic deterioration, of short duration, of nociceptive transducers at the site of injury. The local lesion modifies the way in which the regional nociceptors react to this phenomenon, which are processed in the horn dorsal and transmit painful information when the upward projection systems arrive in the brain. Usually, it is common after surgery and trauma, being necessary wound care, such as immobilization, skin sutures, and analgesic promotion until the restoration of nociceptive functionality (Azevedo, 2018).

Transient pain is generated by nociceptive activation, in the absence of tissue damage. It is commonplace and does not require intervention, exemplified with a prick of a needle, with importance focused on therapeutic regimens (Cruz, 2021).

Chronic cancer pain is associated with continuous tissue damage, justified by the pathological process and its therapy. The influence of these factors is relevant, but these do not comprise the exclusive and predominant causes of pain sensation in the patient oncology (Silva, 2021).

Chronic pain from non-oncological factors is attributed to injuries or pathologies previously existing, which many times have already been cleared, but the pain remains etiologies other than the pathophysiological mechanisms that caused the injury. This one that occurred is possibly a rearrangement of the spinal and brain, after original peripheral traumatic events, the anomaly may have a direct effect in the nervous system followed by disorder in the normal pathways or also by means of compensation that maintains the pain (Cardinot, 2020).

Diffuse type pain indicates a central process or an inflammatory process. THE Localized pain is adjacent to a delimited lesion, peripheral nerve injury, or an immediate postoperative situation (Silva, 2021).

The pulsatile type is a high indicator of bone pathology such as bone metastases, muscle strain and soft tissue injury. The deaf and colicky expressions refer to painful situations involving the viscera, such as irritation, inflammation and intestinal syndromes. Reports of burning, tingling, stabbing or stabbing are consistent with nerve damage or pathological changes correlated with the nerves (Carvalho, 2022).

The concepts constant or intermittent refer to a temporal period of pain.

Constant indicates continuity of existence, responds satisfactorily to medications at time intervals throughout 24 hours. In contrast, the flashing is not so predictable and drugs are applied as needed (Vieira, 2021).

Emerging pain is based on a picture of pain exacerbation that exceeds abruptly the analgesia regulated by targeted therapy. requires intervention immediate relief from this. The incident type follows specific acts such as coughing, walking and weight lifting, therapy is prior to performing such activities (Carvalho, 2022).

7 CLASSIFICATION

Pain is a complex that is classified according to the pathophysiological mechanism, being typified as nociceptive pain syndromes, inflammation and neuropathy. At other pain syndromes comprise this triad or are characterized in terms of of pain due to a comprehensive diagnosis, such as cancer-related pain (Vieira, 2021).

Nociceptive pain requires ascending stimuli propagated by normal nerves, in the course of sensory neurons, and which ascend through the spinothalamic pathways of the spinal cord spinal. It covers somatic and visceral pain (Cruz, 2021).

Somatic pain is localized to the skin surface or intensely in the skeletal muscle. Visceral pain is poorly localized and usually related to organs deeper, such as the intestines (Rodrigues, 2022).

Inflammatory pain is due to the activation of acute inflammatory mediators and chronic, through tissue injury, trigger the painful process (Carvalho, 2022).

Neuropathic pain appears in an abnormal region in neural perspective, being result of damage to the central or peripheral nervous system. The pathophysiology is nonspecific, but the main ones are incisional injury, compression of neural tissue and dietary, chemical, ischemic, metabolic, neoplasm or paraneoplastic (Rodrigues, 2022).

The main sensory alterations in patients with neuropathic pain are allodynia, dysesthesia, hypoalgesia, hyperalgesia, hypoesthesia (Carvalho, 2022).

The sensation is identified as an electrical particularity or associated with paresthesia or abusive temperature changes. The involved portion has a change in sensitivity which is covered by pain. Therefore,

simple and light stimuli such as touch, pressure and temperature are amplified so as to generate intense pain or numbness. the pain neuropathic pain is exemplified by postherpetic neuralgia, phantom limb pain, thoracic post-thoractomy ea typical diabetic neuropathy (Kanematsu, 2022).

8 PAIN ASSESSMENT

The most relevant data to be investigated regarding pain are onset and duration; localization; severity or intensity, which must be stratified by some object or measurement; quality or character, worsening and improving factors, and reactions to any previous treatment (Kanematsu, 2022). It is essential to distinguish localized or diffuse pain, verifying that it occurs irradiation of this. Localized pain has a cutaneous, mucosal and nervous system origin. In In contrast, diffuse pain derives from deep somatic or visceral structures. You types of pain are: localized pain, which does not cost with irradiation; projected pain follows the nerve pathway, which may completely involve the segment, as in herpes zoster, or just on the periphery; referred pain stems from a somatic structure that causes pain in another region of the same nerve segment, seen in back pain resulting from the abscess subphrenic; psychogenic is not categories in the neuroanatomical perspective, and has underlying factor an emotional disorder (Carvalho, 2022).

The physical examination investigates the existence of semiological aspects that are consistent with the pathophysiological mechanism of the underlying pain. The signs are possibly altered by acute pain, or regular in patients with persistent pain. To analyze the painful region includes a search for anatomical distortions, color changes, or skin consistency, spasms or muscle fasciculations. Palpation starts from light mode, advancing in intensity, to analyze the situation more accurately and to ascertain painful reproducibility (Kanematsu, 2022).

The triggering or aggravating factors cause the pain to increase, which the Eating acidic and spicy foods intensifies the pain of gastritis and peptic ulcer. You improvement factors are occasions that generate pain relief, such as postures that protect the structure in which the pain originates, or by the use of medications (Meireles, 2021).

Nociceptive somatic pain is precipitated by palpation of a region established. Pain that increases with action may indicate an injury or irregularity bones. Situation exemplified by abdominal discomfort, correlated with nausea, and the beginning of the inflammatory process results in pain intensification, through the palpation (Carvalho, 2022).

Nociceptive visceral pain has the classic sudden-onset retrosternal pain that radiates to the mandible, a result of myocardial ischemia, which touch does not interfere with in the characteristics of pain (Matias, 2022).

Inflammatory pain is driven by deep inspiration; the increase by Sudden abdominal decompression predicts inflammation. The existence of intensification pain together with lung sounds or irregular friction is consistent with pleuritic inflammation. Already the association of pain and reddened, swollen joints instill arthropathy inflammation (Silva, 2021).

Neuropathic pain courses with allodynia, characterized by painless stimuli if become highly unbearable; hyperalgesia, in which mild factors have high reactivity; causalgia, based on abrupt alliterations of temperature and color of the skin, when equated with surrounding regions; atrophy and alopecia of the regions involved; muscle fatigue correlated with pain; paresthesia by provocation of sensitized areas (Matias, 2022).

9 PAIN SYNDROMES

Cancer pain can be a result of the disease itself or of aggressive therapy.

Emphasizing that other diseases, such as arthritis or migraine, which is sharpened in the during the diagnosis and treatment of the primary neoplastic event (Tavares, 2021).

It does not have a single and isolated pathophysiological environment; this simultaneously can be acute, chronic nociceptive, inflammatory and neuropathic pain. still highlighting more the emergency in relieving this exuberant picture of pain, as it interferes significantly on the patient's quality of life and healing (Lima, 2020).

Functional pain has no recognized organic substrate, being correlated to persistent pain. The main symptoms are irritable bowel syndrome, tension-type headache and migraine and myofascial pain syndromes (Lima, 2020).

Complex Regional Pain Syndrome (CRPS) is chronic, possibly of neuropathic character, with disautonomous signs. It is characterized by the feeling of burning, intermittent paroxysms and addresses two categories. SDRC type 1 courses with ongoing pain, allodynia, or hyperalgesia in which the pain is not trigger-matched, edematous, along with variations in blood flow and abnormalities of the motor functionality in the affected area. Type 2 CRPS is based on pain, allodynia hi hyperalgesia. In the aftermath, it is not restricted to the area of the injured nerve (Silva, 2021).

Phantom pain is a common chronic painful event after amputation of member. Even if the limb is not present, it causes pain, which can be severe and debilitating. It usually involves neuropathic pain and central sensitization from the peripheral nerve (Cruz, 2021).

Bone pain has the particularities of being deaf, painful and constant. It is located in pathological area, with delimitation in the irradiation. The aggravating factors are flexion, extension or even percussion (Carvalho, 2022).

Plexopathies are syndromes associated with a defined peripheral nervous plexus. from an anatomical perspective. Neural disorders address multiple nerves in the plexus. THE brachial plexopathy, pain is magnified by deep breathing or neck mobility and shoulder. Intense shoulder palpation may reflect pain or suggest a distension internal. Brachial plexopathy causes pain due to neoplastic infiltration of nerves, adhesions and compressions after infection, surgery or radiotherapy (Camilo, 2020).

10 ANALGESIA

Refers to the absence of painful sensitivity to stimuli, which is free from pathological conditions would not cause pain and without suppression of the other modalities sensitivity or loss of consciousness. The main forms of sensitivity are tactile, thermal, painful, vibratory, compression, stereognosis and proprioception (Rodrigues, 2022).

Anesthesia is a procedure to reversibly block all types of sensitivity. The purpose is based on allowing patients to go through processes invasive surgical procedures without pain. There are two categories of pain which are the site, which blocks the production and conduction of the electrical impulse in excitable tissues,

being able to locally abolish motor action and sensitivity; the general is a technique that generates complete hypnosis, anesthesia, analgesia and relaxation (Vasconcelos, 2018).

11 PAIN THERAPEUTIC

According to the World Health Organization, pain management follows some general principles that include intake, dose intervals, individualization of therapeutic regimen analgesic ladder, use of adjuvants and attention to detail (Carvalho, 2022).

Administration by oral route is chosen to apply analgesics. You have the purpose of depriving the patient of the discomfort of more invasive means such as injections, pronoun autonomy and control of the situation. Regular time intervals should be established, as the fixed schedule allows the next dose to be offered before the effect of the former has ceased (Carvalho, 2022).

The selection of analgesic treatment should be in accordance with the history patient clinic. Which urges a different dose to regulate pain and alleviate effects collaterals (Rodrigues, 2022).

The analgesic ladder was created by the WHO to promote assistance in the treatment in proportion to the intensity of pain felt by it. From a ladder with three steps, which are based on weak pain and non-steroidal analgesics are administered. opioids (non-steroidal anti-inflammatory drugs and other analgesics). The intermediary is find weak opioids that can be combined with non-opioid analgesics or anti-inflammatories. At the top are strong opioids, which may or may not be associated non-opioid analgesics or anti-inflammatory drugs (Vorpagel, 2022).

Adjuvant drugs have side analgesic effects. These does not hold instant relief, some have their effects after weeks of use (Kanematsu, 2022).

Non-steroidal analgesics have a triad of particularities that address analgesia, antiphlogistic and antipyretic. Ibuprofen is indicated in processes rheumatic, trauma of the musculoskeletal system, especially when they have the typical features of inflammation. In addition, for the relief of post-surgical pain. O diclofenac is reserved for the treatment of degenerative presentations and rheumatic inflammation. Situations exemplified by rheumatoid arthritis, spondylitis chylous, osteoarthritis, spinal pain syndromes,

infections and inflammation. The other drugs in this class are ketoprofen, dipyron sodium, paracetamol (Vieira, 2021).

The most commonly used weak opioid analgesics are tramadol and codeine. O Tramadol acts on the central nervous system, which is useful to treat severe pain intensity. There is association with other anti-inflammatory analgesics (Olivencia, 2020).

Strong opioid analgesics are morphine and nalbuphine. both are prescribed for the relief of severe pain and in Acute Myocardial Infarction (AMI) (Carvalho, 2022).

12 CONCLUSION

Given the existing information in the scientific literature on stratification and pain management can be clarified to be a broad topic, which all subtopics addressed help in understanding the painful involvement. does not come,

It is noteworthy that even with the advancement of medicine, there is a diagnostic deficit of pain, consequently remaining without proper treatment. Then, it is necessary to carrying out more in-depth research and studies that contemplate ways of arrive at a more targeted clinical hypothesis, fulfilling the purpose of depriving the patient from any pain and discomfort. .

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CHAPTER 80

Characterization of the manifestations of Down Syndrome in Brazil between 2016 and 2020: an epidemiological study

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ABSTRACT

Objective: to relate the classifications of trisomy 21 according to the number of live births in Brazilian states between 2016 and 2020. **Methodology:** refers to a retrospective, descriptive study of live births with T21 that occurred between 2016 and 2020 in Brazil. The information pertinent to the preparation of the study was immediately removed from the Information System on Live Births (SINASC) of the Department of Informatics of the Unified Health System (DATASUS) of the Ministry of Health (MS). **Results and discussion:** it can be observed, in the three classifications of Down syndrome, the state of São Paulo with the highest percentage (149 cases corresponding to 60.82%), in the meiotic nondisjunction, and the lowest percentage is the state of Mato Grosso do Sul. south (1 case referring to 0.4%), it can be observed that the classification that presented the lowest percentage of live births was mosaicism, with São Paulo also being the state that presented the highest percentage compared to the others (45 cases referring to 46.40%).

Conclusion: This research made it possible to analyze the three classifications of trisomy at a global level, and pointed out the need to collect primary data that, as they come from existing database systems, depend on the quality of filling out the notification forms, and new research related to the theme.

Keywords: Down Syndrome; Classification; Hospital Information Systems

1 INTRODUCTION

According to the World Health Organization (WHO), Down Syndrome (DS) or trisomy 21 (T21) is not a disease, but a genetic alteration that happens in the cell division of the egg, which results in an extra pair on chromosome 21, called trisomy (Brazil, 2019).

As a genetically determined human condition, it is the most common chromosomal alteration in humans and the

main cause of intellectual disability in the population. The presence of the extra chromosome 21 in the genetic constitution determines specific physical characteristics and developmental delay. It is known that people with trisomy 21, when attended and properly stimulated, they have the potential for a healthy life and full social inclusion (Brasil, 2013).

In this context, Down Syndrome is characterized as the first known cause of intellectual disability, representing approximately 25% of all people with the syndrome. It is estimated that in Brazil it occurs 1 in every 700

births, which totals around 270 thousand people with T21 in the world, in addition, the incidence is 1 in a thousand births alive (Brazil, 2019).

In this sense, at a historical level, it is understood that the first reports about DS date from the mid-20th century.

XIX, however, it is believed that this cellular alteration, manifested in the human phenotype, was always present. Furthermore, studies of the Olmec culture, in the period from 1500 BC to 300 AD, show the representation of children and adults who differed from the others of their tribe and who had a similar description with people under the condition of SD (Pietricoski & Justina, 2020).

In addition, simple or standard trisomy 21 is understood to be caused by chromosomal nondisjunction, usually of meiotic origin, respecting about 95% of DS cases. Occasionally occurring, this type of change genetics is characterized by the presence of an extra chromosome 21, in a tricopy configuration, with the following description of karyotype = 47, XX+ 21 female and 47, XY + 21 male (Coelho, 2016).

Thus, DS by chromosomal translocation (or Robertsonian translocation) usually occurs due to chromosomal rearrangements with gain of genetic material, respecting between 3 to 4% of the cases, which may be casual or be inherited from one of the parents. In this case, the karyotype identifies trisomy 21 not as a free chromosome, but translocated with another chromosome, often involving chromosome 21 and chromosome 14. Thus, the karyotype description corresponds to the following configuration: 46, XX, t (14; 21) (14q21q) in sex female and at 46, XY, t (14; 21) (14q 21q) in males (Coelho, 2016).

Furthermore, the third type of genetic alteration associated with DS corresponds to mosaicism, the cause of more sporadic incidence of DS among the three types, respecting between 1 and 2% of cases. Its occurrence is casual and the zygote begins to divide normally, producing the distribution error of the chromosomes in the 2nd or 3rd cell divisions. O Mosaicism in DS is therefore characterized by the presence of two cell lines, one normal with 46

chromosomes and another trisomy with 47 chromosomes, with chromosome 21 being extra free (Coelho, 2016).

The clinical diagnosis of DS is based on the recognition of physical features. The more features

specific features of DS are identified, it increases the safety of the clinical diagnosis. The laboratory diagnosis of DS is made through genetic analysis called karyotype, is the representation of the set of chromosomes present in the cell nucleus of an individual, taking into account some classifications of trisomy 21 (Pietricoski & Justina, 2020).

Thus, the present study aims to relate the classifications of trisomy 21 according to the amount of live births in Brazilian states in the time frame from 2016 to 2020.

2 METHODOLOGY

This research is configured as a retrospective, descriptive study of live births with T21 that occurred between 2016 to 2020 in Brazil. The pertinent information for the elaboration of this study was taken directly from the Information System on Live Births (SINASC) via the Department of Informatics of the Unified Health System (DATASUS) of the Ministry of Health (MS).

Retrospective studies have the ability to establish the possible factors that precede or characterize an illness or ailment. This type of research can also ensure that measures of likely causal factors have not been influenced by the knowledge of which individuals had the pathology of interest, characterizing the impartiality of the research (Freire & Pattussi, 2018).

Also in this sense, in carrying out descriptive studies, the researcher plays the mere role of merely spectator, without developing any intervention that could interfere with the natural course and/or the outcome of the study. At observational research can be conducted in the form of four types of study, depending on the design. Are they: case series, cross-sectional study, cohort study and case-control study, with the study (Freire & Pattussi, 2018).

Furthermore, it is essential to show that descriptive research occurs when the researcher records and describes the facts observed without interference from the samples found. This study typology seeks to describe the characteristics of particular population or phenomenon or also the establishment of relationships between variables (Prodanov & Freitas, 2013).

The study region corresponds to Brazil, consisting of 11 states by T21 mosaicism (Table 1), 19 states by T21 meiotic (Table 2), 21 states by T21 translocation (Table 3). According to the ICD-10 classification, the

live births whose underlying cause was one of the following ICD-10 codes: Q900- Trisomy 21-n-meiotic disjunction, Q901-Trisomy 21 mosaicism (mitotic non-disjunction), Q902- Trisomy 21, translocation.

Through investigations carried out in May 2022, which were obtained through bank information of SINASC data available on the DATASUS website, it was possible to calculate the percentage of the causes above described for the period from 2016 to 2020.

The variables used with the DATASUS/MS pertaining to the sociodemographic properties were the following: year of birth, federation unit and classification. After extracting the data, they were organized using the

Microsoft Excel® 2010 tool, in order to facilitate the calculation of the percentage of the established categories, and the results represented by tables for better observation and understanding of readers.

3 RESULTS AND DISCUSSION

According to the data collected from the states, the percentage of live births can be obtained, being developed tables and graph, according to classification and states, in the last 5 years (2016 to 2020).

In Brazilian states, there were 97 cases of T21 due to mosaicism, in the 5-year interval (2016-2020) according to DATASUS, with São Paulo (46.40%), Rio Grande do Sul (15.46%) and Espírito Santo (12.37%) with the highest percentage and the state of Rio de Janeiro (1.03%) Mato Grosso (1.03%) with a lower percentage, it can be seen that this number does not follow

a constancy according to the years, as shown in table 1.

Furthermore, approximately 95.00% of children have simple trisomy 21, in which there are 47 chromosomes with an extra chromosome 21 present, in 1.00 to 2.00% of people with the SD phenotype, there are 2 lines cells, one typical and the other with trisomy 21, a condition called mosaicism (Moriyama, 2022).

In addition, as described by Moriyama (2022), the classification of DS by mosaicism in comparisons with the others is much smaller, as it was noticed when analyzing the following 3 tables according to the years and states the index of live births in the last 5 years with a total of 97 births

Table 1: Percentage of live births with T21, mosaicism (mitotic n-isjunction) according to Brazilian states, 2016 to 2020.

Variables	Years													
	2016		2017		2018		2019		2020		Total			
States	N	%	N	%	N	%	N	%	N	%	N	%		
Sao Paulo	9	9.28%	11	11.34%	4	4.17%			9	9.28%	12	12.37%	45	46.40%
Rio Grande do SUL	3	3.09%	3	3.09%	5	5.15%			2	2.06%	2	2.06%	15	15.46%
Holy Spirit	2	2.06%	3	3.09%	4	4.17%			3	3.09%	0	0.00%	12	12.37%
Minas Gerais	2	2.06%	1	1.03%	0	0.00%			2	2.06%	3	3.09%	8	8.25%
Federal District	0	0.00%	0	0.00%	0	0.00%			1	1.03%	3	3.09%	4	4.17%
Bahia	0	0.00%	0	0.00%	1	1.03%			1	1.03%	1	1.03%	3	3.09%
Santa Catarina	1	1.03%	0	0.00%	0	0.00%			1	1.03%	1	1.03%	3	3.09%
Goiás	0	0.00%	1	1.03%	2	2.06%			0	0.00%	0	0.00%	3	3.09%
Pernambuco	0	0.00%	1	1.03%	0	0.00%			0	0.00%	1	1.03%	2	2.06%
Rio de Janeiro	0	0.00%	0	0.00%	0	0.00%			0	0.00%	1	1.03%	1	1.03%
Mato Grosso	0	0.00%	1	1.03%	0	0.00%			0	0.00%	0	0.00%	1	1.03%
Total	17		21		16		19		24		97			
%	17.53%		21.65%		16.49%		19.58%		24.74%		100%			

Source: Data SUS.

It was found that in the state of São Paulo (60.82%), Acre (8.98%) and Minas Gerais (5.30%), presented higher T21 indexes by meiotic n-disjunction, while Alagoas (0.40%) and Mato Grosso do Sul

(0.40%) present a lower percentage. It was also noticed that in recent years there has been an increasing incidence of cases, however, in 2019 a decline was obtained, according to table 2 below.

Despite this, although the meiotic T21 in 2018 showed an increase of 21.22% in births, in 2019 there was a relapse to 17.55%, but in 2020 there is a big difference of 26.53% with 65 cases in the Brazilian states, with São Paulo being the state with the highest number of cases compared to the others (Table 2).

Table 2: Percentage of live births with T21 n-meiotic disjunction according to Brazilian states, 2016 – 2020.

Variables	Years											
	2016		2017		2018		2019		2020		Total	
States	N	%	N	%	N	%	N	%	N	%	N	%
Sao Paulo	17	6.93%	33	13.47%	32	13.06%	29	11.83%	38	15.51%	149	60.82%
Acre	4	1.63%	9	3.68%	5	2.04%	1	0.40%	3	1.22%	22	8.98%
Minas Gerais	4	1.63%	3	1.22%	2	0.81%	1	0.40%	3	1.22%	13	5.30%
Rio Grande do Sul	1	0.40%	0	0.00%	4	1.63%	2	0.81%	3	1.22%	10	4.08%
Paraná	0	0.00%	0	0.00%	1	0.40%	3	1.22%	4	1.63%	8	3.26%
Holy Spirit	1	0.40%	0	0.00%	4	1.63%	2	0.81%	1	0.40%	8	3.26%
Federal District	1	0.40%	0	0.00%	0	0.00%	0	0.00%	5	2.04%	6	2.45%
Bahia	1	0.40%	0	0.00%	1	0.40%	2	0.81%	2	0.81%	6	2.45%
Ceará	0	0.00%	1	0.40%	0	0.00%	2	0.81%	2	0.81%	5	2.04%
Santa Catarina	0	0.00%	2	0.81%	1	0.40%	0	0.00%	1	0.40%	4	1.63%
Mato Grosso	0	0.00%	2	0.81%	0	0.00%	0	0.00%	1	0.40%	3	1.21%
Rio de Janeiro	1	0.40%	0	0.00%	1	0.40%	0	0.00%	0	0.00%	2	0.80%
Goiás	0	0.00%	0	0.00%	0	0.00%	1	0.40%	1	0.40%	2	0.80%
Pernambuco	1	0.40%	0	0.00%	0	0.00%	0	0.00%	1	0.40%	2	0.80%
amazon	1	0.40%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	0.40%
Amapa	0	0.00%	0	0.00%	1	0.40%	0	0.00%	0	0.00%	1	0.40%
large northern river	0	0.00%	1	0.40%	0	0.00%	0	0.00%	0	0.00%	1	0.40%
alagoas	0	0.00%	1	0.40%	0	0.00%	0	0.00%	0	0.00%	1	0.40%
Mato Grosso do Sul	0	0.00%	2	0.80%	0	0.00%	0	0.00%	0	0.00%	1	0.40%
Total	32		53		52		43		65		245	
%	13.06%		21.63%		21.22%		17.55%		26.53%		100%	

Source: DataSUS.

In this lens, according to Candace et al. (2014), in most autosomal trisomies, trisomy 21 is more often the result of errors in the oocysts (referring to maternal errors) and accounts for 90% of cases among these meiotic maternal errors. It is worth mentioning that maternal age was identified as the potentiating risk factor for T21. IT IS

It is important to point out that Down syndrome does not occur only due to disjunction errors, even though, in most cases,

In some cases, the extra chromosome is derived from this incorrect division. In Table 2 it is possible to observe a higher rate of births living through the states that have the highest prevalence, different from Table 1. That said, in the context of T21 by translocation in Brazil, São Paulo (30.80%), Minas Gerais (19.09%), Espírito Santo (6.58) have higher percentages of cases, contrary to Piauí (0.50%) and Alagoas (0.50%), which have a lower percentage, as shown in Table 3.

Table 3: Percentage of live births with T21 translocation according to Brazilian states, 2016 to 2020.

Variáveis	Anos											
	2016		2017		2018		2019		2020		Total	
Estados	N	%	N	%	N	%	N	%	N	%	N	%
São Paulo	14	7.07%	14	7.07%	11	5.55%	8	4.04%	14	7.07%	61	30.80%
Minas Gerais	2	1.01%	12	6.06%	8	4.04%	10	5.05%	7	3.53%	39	19.69%
Espírito Santo	2	1.01%	0	0.00%	3	1.51%	5	2.52%	3	1.51%	13	6.56%
Santa Catarina	1	0.50%	1	0.50%	4	2.02%	6	3.03%	1	0.50%	13	6.56%
Sergipe	0	0.00%	5	2.52%	6	3.03%	1	0.50%	0	0.00%	12	6.06%
Rio Grande do Sul	1	0.50%	1	0.50%	5	2.52%	3	1.51%	2	1.01%	12	6.06%
Distrito Federal	0	0.00%	1	0.50%	3	1.51%	4	2.02%	2	1.01%	10	5.05%
Goias	2	1.01%	0	0.00%	3	1.51%	2	1.01%	1	0.50%	8	4.04%
Rio de Janeiro	1	0.50%	2	1.01%	1	0.50%	0	0.00%	0	0.00%	4	2.02%
Paraná	0	0.00%	0	0.00%	3	1.51%	1	0.50%	0	0.00%	4	2.02%
Rio Grande do Norte	0	0.00%	0	0.00%	0	0.00%	2	1.01%	1	0.50%	3	1.51%
Rondônia	1	0.50%	0	0.00%	0	0.00%	0	0.00%	2	1.01%	3	1.51%
Maranhão	0	0.00%	1	0.50%	1	0.50%	0	0.00%	1	0.50%	3	1.51%
Ceará	0	0.00%	0	0.00%	0	0.00%	1	0.50%	2	1.01%	3	1.51%
Mato Grosso	0	0.00%	2	1.01%	0	0.00%	0	0.00%	1	0.50%	3	1.51%
Paraíba	0	0.00%	0	0.00%	1	0.50%	0	0.00%	0	0.00%	2	1.01%
Pernambuco	0	0.00%	0	0.00%	0	0.00%	1	0.50%	0	0.00%	2	1.01%
Bahia	0	0.00%	0	0.00%	1	0.50%	1	0.50%	0	0.00%	2	1.01%
Acrê	0	0.00%	0	0.00%	0	0.00%	1	0.50%	0	0.00%	1	0.50%
Piauí	0	0.00%	0	0.00%	1	0.50%	0	0.00%	0	0.00%	1	0.50%
Alagoas	1	0.50%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	0.50%
Total	25		39		51		46		37		198	
%	12.62%		19.69%		25.75%		23.23%		18.68%		100%	

Source: DataSUS.

In addition, the so-called Robertsonian translocations, which occur in 3 to 4% of DS cases,

It may be incidental or inherited from one of the parents. Chromosome 21 trisomy, in this case, is identified in the karyotype not as a free chromosome, but translated to another, more frequent chromosome, the translocation involving the chromosome 21 and 14 (Brazil, 2013).

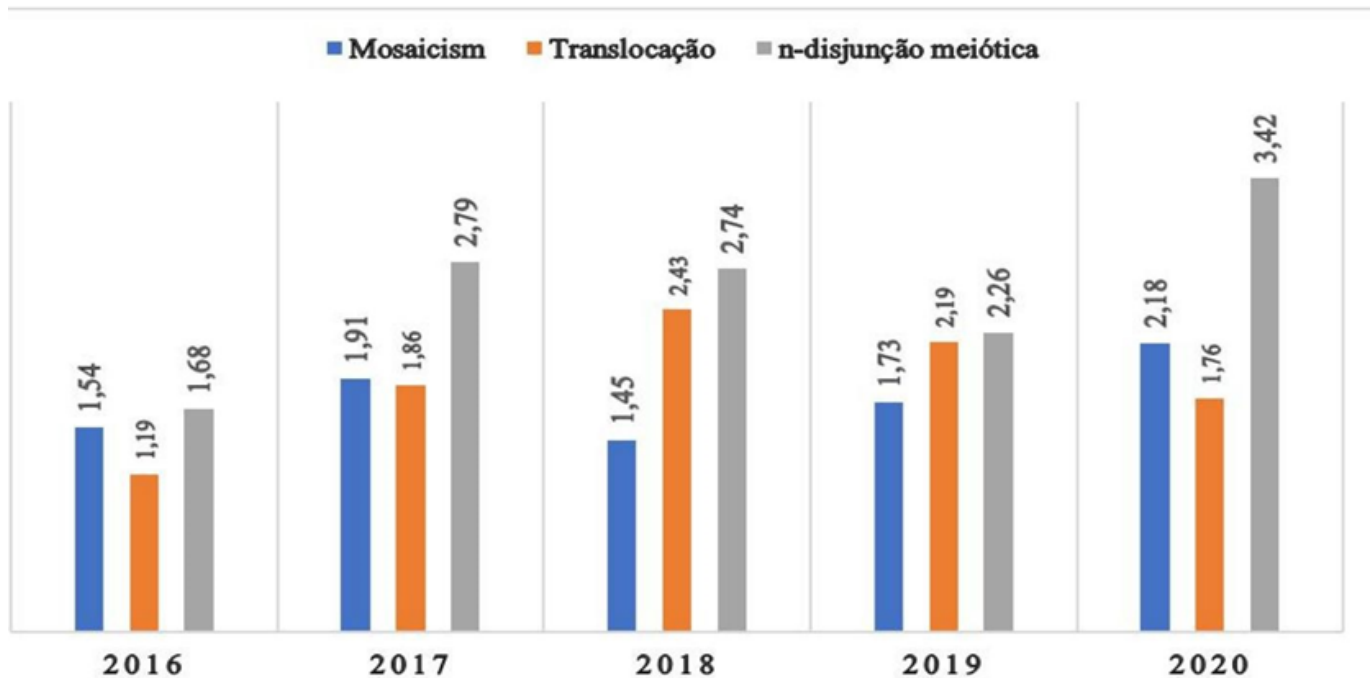
Unlike the other results, it was possible to observe that the number of live births by translocation was a total of 198 people in the last 5 years, considering that it is not as frequent compared to meiotic classification, but also it does not have a low index like mosaicism.

In T21, the translocation in Brazil, showed an oscillation from the year 2016 to 2018, it grew 13.13% already in the year 2018 to 2020 there is a 7.07% reduction in births, with São Paulo being the state with the highest prevalence of 30.80% of live births in the last 5 years (Table 3).

In addition, according to graph 01 below, the classifications were in order, n- meiotic disjunction with greater percentage, while mosaicism and translocation suffer some variations according to the years. And in line with the saying above, meiotic n-disjunction classifications have a higher percentage in live births in the last 5 years, manifesting an increase in births with Down Syndrome in 2020.

Graph 1: Comparison of T21 classifications according to year of birth, 2016 to 2020.

- Mosaicism
- Translocation
- Meiotic Nondisjunction



4 CONCLUSION

From the discussion exposed in this study, it is understood that the three classifications of Down Syndrome were created to systematize the terms of health, illness and functionality, as well as to allow their differentiation according to their respective genetic manifestations. Due to the data mentioned and exposed, it is observed that, in relation to the t21 classifications, meiotic n-disjunction was the most represented among the occurrences in the years that make up this clipping temporal.

It is added that, as evidenced in the literature, the classification of DS by mosaicism represented the lowest occurrences between demonstrations. Notwithstanding this, at the geographic level, it was noticed that in the three classifications, the state of São Paulo became highlighted by the large percentage evidenced, this finding is associated with its quantitative grid populational.

In this sense, this research made it possible to analyze the three classifications of trisomy 21, explaining, quantitatively, the percentage distributions of SD at the national level, evaluating the information provided in the DATASUS system, combining them with the current literature. This study nurtures a horizon for further research on this topic, providing new insights of the SD, as well as facilitating the process of including these people in society, through the understanding of their existence, especially in the states with the highest population rate.

Finally, the need to collect primary data for new studies is highlighted, since, knowing that the information that supported this research, as they come from existing database systems, depend on the quality and veracity of filling out the notification forms.

Thus, it is suggested the production of more studies aimed at deepening these materials, as well as a synthesis of studies of current elements about DS is suggested, especially after the pandemic period experienced, to understand the new live birth rates and their national distributions.

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CHAPTER 81

The marketing challenges faced by the medical entrepreneur

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ABSTRACT

Being an entrepreneur is not an easy task, and this becomes more complex when the entrepreneur is also a physician. This occurs because of the busy life and the little free time that these health professionals have. Therefore, this article has as its main theme the marketing setbacks faced by the entrepreneurial physician. Regarding the objective, the aim was to describe the marketing challenges faced daily by entrepreneurial physicians. Thus, the methodology used was an integrative literature review, with a qualitative approach. The results showed that the challenges are diverse and caused by diversified factors, thus, the physician must seek his differential to stand out in the market. It was also found the lack of a good basis of administration, which is necessary for the good performance of any company, as these subjects are not offered in the medical course, it becomes another challenge to be faced.

Examples were also quoted from doctors who use social networks as a way of attracting new customers/patients.

Keywords: Challenges; Entrepreneurship; Physician; Health.

1 INTRODUCTION

Undertaking in the health sector is one of the great challenges for professionals in this area. In a time of intense technological innovations, it is necessary to create new ideas and improve existing ones, in addition to innovating by creating products and services that promote the well-being and quality of life of clients/patients, even more so when it is related to entrepreneurial doctors (Bandeira, 2019).

In order to understand what entrepreneurship is, it should be noted that its emergence took place at the beginning of the industrialization, due to the First Industrial Revolution that took place in the 17th century in Great Britain. At that time, there were providers of capital, known as capitalists, and over time and with changes in the economic system, Entrepreneurs began to distinguish themselves among suppliers (Coutinho, 2019).

In general, entrepreneurship is the process of forming a new business, or even the remodeling of an existing enterprise, and it serves to cause positive impacts on the lives of individuals. Entrepreneurship goes beyond the knowledge acquired in the classroom, it takes courage, creativity and being different from others. Are characteristics necessary to attract customers and thus generate profits for your company. In entrepreneurship there is also the Startups model, that is, it answers not only about what a particular company intends to sell, but jointly, how the products/services are made, their differential and importance, in addition to determining what their niche is, and how it will be obtained the expected profit (Marques, 2020).

As the main theme of this article, there are the challenges of undertaking in the area of Medicine, since it grows exponentially the number of doctors who opt for ventures to obtain a greater financial gain, either in the area of health, as is the majority, or in other business areas. As during graduation, this professional does not attend no discipline related to financial management or marketing, he tends to look outside the academic environment for tools and methods of knowledge related to administration, and that is where the first challenges to be faced arise.

The doctor, in his daily life, always makes decisions in moments of great pressure and euphoria and most of them are assertive, that is, he takes great risks, however this is not enough to be a good entrepreneur. Without the study theory, how to successfully undertake, as it is found in different hospital environments, clinics of others, the medical professionals do not find it easy to align their activities with market demands (Aveni & Morais, 2021).

Because it is a very recent topic, there are few articles that deal with entrepreneurship in the area of health, what you find most are articles on reliable and reputable websites about the entrepreneur doctor, however Published works on entrepreneurship and health are quite scarce. So, for a better understanding and execution For this research, materials from reliable websites and electronic magazines were used, which do not compromise the quality of this file. Therefore, this article aims to describe the main marketing challenges that physicians entrepreneurs face today.

2 METHODOLOGY

This article adopted a methodology of bibliographic and integrative review, and the approach chosen was of the type qualitative. In this way, Marconi and Lakatos (2021) explain that literary research is an in-depth and broad analysis on a given topic in available publications. They also reiterate that it is the basis for all academic research. Regarding the integrative review, it aims to order and summarize the results obtained. Therefore, the approach qualitative analysis analyzes human behavior, that is, it analyzes the way of thinking of individuals in a given community (Gil, 2020).

Regarding data collection, it was carried out in the following indexing bases: Scientific Electronic Library Online (SciELO); Medical Literature Analysis and Retrieval System Online (MEDLINE via BIREME); U. S. National Library of

Medicine (PubMed via NCBI); and Cochrane Library. However, because it has a current theme, it was necessary to visit websites and reliable electronic journals in the area of health and administration, without compromising the ethics and credibility of the present article. The descriptors used were: “Challenges”, “Entrepreneurship”, “Doctor”, “Health”, in the Portuguese, English and Spanish.

Thus, for a good performance of this work, inclusion and exclusion criteria were defined for the studies. *A priori*, to be classified as eligible to be part of the article, articles, dissertations, books and current publications, with a maximum of five years of publication, that is, research published between 2017 and 2022, which were in Brazilian Portuguese, English and Latin American Spanish. *A posteriori*, the works that did not fit in the previous criteria, were excluded from this article.

3 RESULTS AND DISCUSSION

Nowadays, a lot is heard about entrepreneurship in the health area, especially from the doctor entrepreneur, which in the past society could not observe a simultaneity between both, that is, the entrepreneur

was the one who lived only between the four walls of an office and the doctor, that individual fully dedicated in hours infinite in the hospital with their patients. However, things have changed in a beneficial way, the doctor can now exercise their role of caring, as well as undertaking and profiting from their work activity.

Thus, to undertake means to do something that has a significant and diversified impact on people's lives, better

In other words, it is the ability to idealize, set up and carry out new businesses, even change existing companies, undertake challenges and risks are synonymous. Other authors cite the concept of entrepreneurship as the ability of a individual to identify problems in certain areas and seek solutions to these obstacles, in addition to having real impacts on the human daily life (Hashimoto & Borges, 2020).

Thus, some researchers believe that the high competition is one of the reasons that make the doctor seek undertake, as this would make a difference to their colleagues. With technological innovation, much has been sought for networks social as a showcase, where some expose their personal life to generate a rapprochement with their future client/patient, this occurs in parallel with the dissemination of their enterprise (Andrade et al., 2017).

However, not everyone still sees this with good eyes, as is the case of the author Pavaroni (2022), his criticism is punctuated in newly graduated doctors who believe that starting a business is easy and end up falling for the “siren song”. He quotes in his matter for the medical academy, that a professor at the Institute of Radiology (InRad) at Hospital das Clínicas da Faculdade of Medicine at USP (HC-FMUSP),

Giovanni Cerri, reports that 30% of his students do not want to follow a medical career, who chose to be entrepreneurs and startup founders. Thus, Pavaroni(2022), explains that this is scary and is taking place because of the technological evolution and the access that anyone can have on the different professional areas, as well as doctors feel the need to be diverse.

Throughout his work, he explains that newly graduated doctors are not satisfied with a degree, or even a well done residency is not enough to keep the office full, but the dissemination of its services, either through social media, television, radio or “word of mouth”. Pavaroni (2022) criticizes that these advertisements seem more important than the medical certificate, and end up being confused with easy entrepreneurship.

However, the challenges faced by the entrepreneur physician are not few, among them is to make a good business plan, organize your schedule, understand marketing logistics, people management, manage the accumulation tasks, take care of financial management and align with market demand. First, the business plan second Hashimoto and Borges (2020), should be done to try to reduce the risks of the venture, the doctor who, before starting it, define all your plans, highs and lows, for example, as your main competitors and differential, will reduce the likelihood that your company will not get good results.

In this way, organizing the agenda normally requires attention, however, when it comes to the busy life of a doctor, it needs to be redoubled, those who are starting to undertake, need to do it individually, an organized way not to compromise your opening hours, and over time you will need a secretary, that is, delegating some functions, and thus will be able to be more successful in the entrepreneurship activity (Morsch, 2020).

In terms of methodological logistics, as in any other market, the entrepreneur doctor must pay attention to the operation of the market, create attractions to attract customers/patients, observe the country's economy, that is, know how to behave in the face of an economic crisis. Therefore, the doctor himself needs to overcome the barrier that saving lives need not profit from it (Sator et al., 2022). In people management, it refers to those companies that have a certain time in the market and according to its rise it is necessary to add people in the functions, this is a point crucial for the doctor, as he must manage as a good leader, motivating his employees and keeping the team united in pursuit of service excellence (Demo, 2018).

Another challenge to be overcome is the accumulation of tasks, it is known that the life of a doctor is already troubled by activities, however when he decides to undertake, he will need at least one person helping him to seek balance between administrative and in-office consultations (Santos, 2022). Regarding financial management, there is the understanding of the finance, as in medical graduation this discipline is not offered, it is up to the doctor to seek ways to obtain this knowledge, there are several management programs on the market and also the vocation to undertake (Aveni, 2019). And why Finally, one has to align the market demand, that is, what is being seen and requested the most, the doctor must be attentive to each service request (Fonseca, 2019).

Andrade et al. (2017), citing in their research on the doctor, entrepreneurship and quality of life, highlights that Most physicians do not seek administrative technical training, which hinders their results and the

overcome their challenges. The study of these authors was carried out with a total of 36 physicians, who have in the same building in the State of Rio de Janeiro, in the city of Niterói. They aimed to assess self-perception of these professionals in terms of their knowledge, practice and connection with entrepreneurship, in addition to Moreover, it was evaluating and correlating these data with the levels of satisfaction in their quality of life. As results explained that:

“It made it possible to observe that physicians with an autonomous profile (full or partial) are self-employed service providers who accumulate the functions of technicians in medical science and managers of their own offices. This last function requires the presence of an entrepreneurial spirit, focused on the structuring and development of the small (or micro) business and the exercise of routine administrative practices, aimed at its operation. However, most of the doctors surveyed do not see themselves as service providers, nor as entrepreneurs, nor as routine administrators. They see themselves only as doctors, in their technical role. In addition, they have little administrative knowledge, both basic and strategic. These few existing knowledge were not acquired in the Faculty of Medicine” (Andrade et al, 2017, p. 08).

Admittedly, most doctors feel overwhelmed and short on time. Now, a good part feels happy and chose the profession they chose for life, but this is different when it comes to entrepreneurship, for lack of knowledge and without management tools, better said administrative.

In view of the results exposed, it is clear that there are several challenges faced by physicians in the art of undertake, it is not just those items, they go beyond, and to overcome them, the doctor needs to seek to have a base in management of business, because according to (Colichi et al., 2019), it covers the evaluation of enterprises, as well as their errors and guidelines for good management. These disciplines and management, unfortunately, are not offered in the curriculum of Medicine, which nowadays could be rethought.

The problem exposed in the results is in relation to physicians who are starting a medical career associated with of entrepreneur, believe that it is easy to create and maintain a company, and even more do it in search of reduction of shifts, for example, which is considered very tiring, but they are not planned with a good administrative base and end up having difficulties from internal and external factors (Tomé & Aidar, 2019).

What you see on social networks is an aggressive marketing of doctors offering their services, each one looking for their own differential, some examples are Camila Karam, a dermatologist, who already invested in social networks during her graduation and recently launched your clinic. Flávia Jú, who is a plastic surgeon and started her exhibition with the intention of traveling with less costs, but of time has created suture courses and has an online store and launches projects such as the medical godfather. The cardiologist Neif Musse and his two sons Ricardo and Guilherme, also cardiologists, are entrepreneurs and travel around Brazil with the course of Electrocardiogram. Therefore, all these examples are from some

entrepreneurial doctors who used social networks as a means of attracting customers/patients and, of course, aiming at profit.

There is no way to be an entrepreneur in any area and not invest in marketing, it is one of the most important to attract customers, and can be done in several ways, through TV, radio, social networks, flyers, outdoors or best of all, through “word of mouth”. Health marketing is used to increase the amount of clients in a clinic, for example, always looking for a good communication strategy and the doctor when he is in the network social media such as Instagram, for example, it is the very image of your company (Netto, 2019).

It was even mentioned on competitiveness, there is the argument that the increase in private schools of Medicine has created this “boom”, so the migration of doctors to entrepreneurship, however, technological innovations are also one of the reasons, and it arises for companies to improve their service, and in no other sector that generate profit would be different, primarily from health, which should always seek the well-being of the population. So find technological solutions such as Digital Medicine and Telemedicine is a differential for a clinic or office, including the adherence to medical record software (Bottoni et al., 2019).

4 CONCLUSION

The doctor who undertakes, seeks to diversify in a market that becomes increasingly competitive. He must acquire the basic knowledge of administrative management, but being aware that it requires dedication, attention, creativity and a lot of courage, although the doctor, in general, does not need the company to have his gain main. However, if he wants to increase his profit, it is through the entrepreneurial activity that he will achieve, going through all the mishaps you will encounter along the way.

The objective of this writing was achieved, since the main marketing challenges that the doctors who decide to undertake find in the present day. In addition, examples of physicians who use social networks to attract customers, taking advantage of personal marketing that helps them to get closer to the future client and creates a link of trust with the company of these professionals.

Thus, this article is of paramount importance for medical and administrative sciences, as it is a new study and also about the difficulty to find articles that deal with this theme, it will serve as a basis for future studies in this segment.

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CHAPTER 82

Prevention of teenage pregnancy in the state technical school Pedro Muniz Falcão

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ABSTRACT

According to the World Health Organization (WHO) adolescence is related to period gives life in between you 10 and 19 years old, at the which occur deep changes, characterized mainly by rapid growth, emergence of the characteristics sexual secondary, awareness gives sexuality, structuring gives personality, adaptation environmental and integration Social. O century XXI, The was gives modernity, The pregnancy precociousness is still a subject little discussed in Brazilian schools and families, in the However, sex life is starting earlier and earlier, and as the years go by passing this initiation becomes even more precocious. The present study was carried out through a lecture with the use of slides using the data show as a resource, addressing the prevention of teenage pregnancy, being taught by students of the first semester, in the discipline of Interaction in Health in the Community (IESC), of the medical course at FAP-Arariquina, in 2022. Two polls, The first survey was looking for know O level in understanding Preview about education sexual intercourse, before the proposal presented. After that, a second survey was carried out to regarding the level of understanding about sex education after explanation of the theme. THE lecture with O theme prevention gives pregnancy at adolescence approached together to the students you following matters: O what It is to be adolescent, consequences gives pregnancy at adolescence, planning familiar and methods contraceptives with The goal in awareness. This activity took place in a didactic way with student interaction, in what you same take away your doubts The respect of theme. In relationship The survey carried out about the knowledge before and after the lecture, it is possible to notice that, despite having a diversification of knowledge levels before the lecture takes place, in which there is prevalence of level 8, referring to a good

degree of knowledge. However, it was notable what occurred a increase significant in that grade, already what there is one prevalence From levels 9 and 10, showing the importance of spreading knowledge to this target audience. Therefore, this project provided the apprentices of the State Technical School (ETE) with Pedro Muniz Hawk, in Araripina-PE, a larger knowledge about O Subject approached, making them aware about at consequences in one possible pregnancy at

adolescence, in addition from that, The lecture generated one great satisfaction to group, one turn what he was important to pass on great content relevance in days current.

Key words: pregnancy, adolescence, school, education.

1 INTRODUCTION

Second The Organization world in Health (WHO) The adolescence it is related to period gives life in between you 10 and 19 years old, at the which occur deep changes, characterized mainly by rapid growth, emergence of the characteristics sexual secondary, awareness gives sexuality, structuring gives personality, adaptation environmental and social integration.

O century XXI, The was gives modernity, in big ones changes in values morals and in behaviors, The pregnancy precocious still It is a theme little discussed in the schools and in the

Brazilian families, however, sex life is starting earlier and earlier, and measure what you years old they go passing it is initiation becomes still most precocious. THE pregnancy in adolescence most of the time it negatively affects the family relationship and in school life, moving the teenager away from school and possibly restricting your upcoming professional. The pregnancy seen at this stage is a reality in Brazil and, despite susceptible in any class Social, you factors economic and Social are determinants us indexes statisticians. (RODRIGUES; SILVA; GOMES, 2019).

Furlani (2011) reports that an unplanned pregnancy in adolescence requires a greater attention. The strategy of developing in young people responsibility for the acts of practice sexual, well as The understanding From effects in one pregnancy no planned, has been O focus in some investments educational. In wake up with The author, create mechanisms what inform, guide and raise awareness you teenagers about sexuality, mainly about sexual practice and its consequences, is relevant to awaken us young people O interest in to meet all you scratches arising in acts sexual, From methods of protection and prevention. It is essential that they receive effective guidance for the construction in your maturity and, so, have The capacity in to take decisions conscious and prevent an unplanned pregnancy.

At the Brazil, O Ministry gives Health (MS) has worked in manner articulated for reduce The rate in pregnancy at adolescence. The percentage still lies 18% above gives high worldwide rate, but as efficiency gains in joint actions, it is possible, in addition in decrease O indicator in yes, improve others important numbers, as of miscarriage , birth premature and mortality maternal, evasion school, potential I established ment in dysfunctional and vulnerable families, abuse of alcohol and other drugs, as well as as in situations in abandonment, abuse, violence and lack in protection effective at children and to the adolescents (BRAZIL, 2010).

Thus, this work becomes essential to open discussions on the subject, through lectures and educational activities aimed at raising awareness among students and inviting them to reflect about the consequences in one pregnancy not planned.

2 METHODS

This article was carried out through a lecture at ETE-Pedro Muniz Hawk, approaching the theme about the prevention of pregnancy at adolescence, being given by the students of first semester, at subject in Interaction in Health at Community (IESC), of course of medicine gives FAP-Araripe, in year of 2022

In addition, as an intermediary means, the slide presentation was used in the lecture using data to make the environment more visual and generate greater understanding among teenagers. Thus, the resource used was the presentation in Power point.

In sequence, two surveys were carried out, the first survey sought to find out the level of prior understanding of sex education, before the proposal presented. After that, a second survey was carried out regarding the level of understanding about education sex after explanation of thematic.

The inclusion methods for this article were selected adolescents from 14 to 18 years. Using the method of excluding students who are outside this range age (14-18 years).

Against the high index in teenagers pregnant at the County in Araripe, emphasizing the Alto da Boa Vista I neighborhood, where of the 69 pregnant women followed in the pre-Christmas, 20 are teenagers, according to data from the Citizen's Electronic Record (PEC), it is done required the debate about the current situation. This one job will promote discussion on the topic while raising awareness among students for the related issues of pregnancy and the use of contraceptive methods.

This research will also bring information to the school community about the consequences in one pregnancy unwanted, already what the same affect directly the educational performance, where these adolescents move away from school activities due to the care needed before and after this phase. Work with teenagers pregnant in wake up with Moreira et al. (2008) implies in challenges for understanding this one world full of subjectivity and contradictions.

3 RESULTS AND DISCUSSION

It was observed, at first, in the Family Health Strategy-Alto da Boa Vista I, one determined the amount in teenagers pregnant. Of that form, felt the need to address the "prevention of pregnancy at adolescence", theme that what he was reinforced with the percentage issued for PEC, with that, were used topics, as "What is to be Adolescent?"; "Consequences of pregnancy at adolescence"; "Planning familiar" and "Methods Contraceptives"—with the goal in awareness.

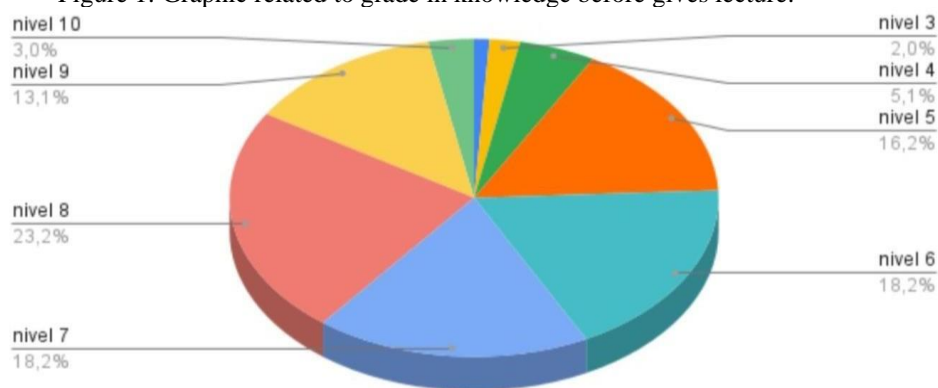
THE adolescence, phase of cycle vital in between The childhood and The adulthood, It is characterized per biopsychosocial changes peculiar to each being, transforming habits and consolidating behaviors. In this phase, you teenagers they can experience new experiences, many times with scratches against of vulnerabilities, being one from them The precocity gives activity sexual, moved fur pleasure momentary, ignoring The possibility in pregnancy and contamination and/or spread of sexually transmitted infections (FAIAL et al, 2019).

In general, teenage pregnancy is classified as risky, because represents a biological risk situation (for both mothers and newborns) born), and exist evidence in what This one phenomenon still reverberates in way negative in school dropout rates (both before and after pregnancy), impacting the level in schooling gives mother, decreasing your opportunities future (DAYS; TEIXEIRA, 2010).

Second Rock (2006) O planning familiar presupposes one assistance what be likely to offer at alternatives possible in methods contraceptives, well as O knowledge in your indications, contraindications and consequences in use, ensuring elements necessary for The free choice of method what best if adapt The women or to couple. O planning familiar also includes O side dish From couples infertile. With O development technological at the field gives contraception and you advances at the scope gives health sexual and reproductive, provide information and means related to the methods contraceptives existing It is one of best shapes in accession The a prevention program. Offering choices to the young woman, or even to the couple, generates safety and, consequently, best use of method. This one It is a time very important, implies in one life sexual safe and satisfactory, by having The capacity in reproduce and The freedom in decide about When and how many times he must do it (BERLOFI you in the, 2006).

Given this condition, the activity was carried out on July 4, 2022, at the Monday, with The approach From topics, presented previously, at the auditorium gives ETE - Pedro Muniz Hawk, with The use in methods quantitative, in responsibility and direct collaboration of the students, where it was given to the students to poll both at the beginning of the lecture and at the end to be answered by them. By having as result, of that survey, a total in 99 answers about O your knowledge prior before and after activity.

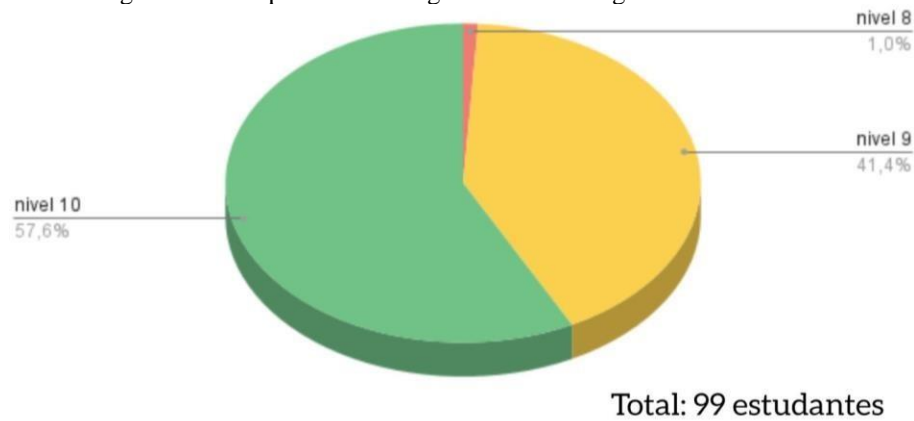
Figure 1: Graphic related to grade in knowledge before gives lecture.



Total: 99 estudantes

Source: authors

Figure two: Graphic related to grade in knowledge after The lecture.



Source: authors (99 STUDENTS)

In wake up with The figure 1, It is possible to notice what, although in be one diversification of knowledge levels before the lecture takes place, there is a prevalence level 8, referring to a good degree of knowledge. However, analyzing Figure 2, it is It is clear that there has been a significant increase in this degree, since there is a prevalence of levels 9 and 10, showing The importance gives propagation in knowledge for that public- target.

Thus, it can be seen that the lectures are opportunities to learn more about a particular issue that, in a very significant way, can impact the way of working, productivity, studies and even the way a person he can to see the world.

4 CONSIDERATIONS FINALS

This project proposed to elaborate a dynamic and reflective lecture, in a way that would add knowledge, as well as clarify the young people of the ETE school - Pedro Muniz Falcão on the prevention of teenage pregnancy. for the work was not merely expository, we sought the help of tools that could become more absorbable The thematic. can, so, to arrive The some conclusions: although in a public well diversified, the teenagers, after the lecture, developed a greater knowledge (a addition) on The pregnancy in adolescence.



In addition, the lecture generated great satisfaction for the group, since it was important to pass on a content of great relevance nowadays, as well as open space for possible doubts that the students present could have about the theme.

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CHAPTER 83

The Importance Of Organizational Culture In The Success Of Companies

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ABSTRACT

This article discusses the definition and measurement of organizational culture and its impact on

organizational performance by reviewing existing empirical research and the link between models and organizational culture and performance. This work aims to analyze the degree of influence of the organizational culture and make recommendations for improvements applicable to the public and private sectors to increase the efficiency of the services provided and the organization in its clients or the community. An analysis of a large body of literature found that organizational culture has a deep impact on the diversity of organizational processes and their performance. It also describes different dimensions of culture. Research shows that if employees are engaged and share the same norms and values as the organization, they can improve performance to achieve the organization's overall goals, at the same time, the company must understand and grasp the complementary relationship between strategic management and organizational culture can help improve quality and overall competitiveness, promote access to quality, sustained and healthy development.

Keywords: organizational culture; companies; success; innovation; research.

1 INTRODUCTION

Kenny (2013) pointed out that when an organization becomes more diverse, managers have more challenges managing and controlling resources. Organizational culture is an important component of organizational performance and a source of sustainable competitive advantage. Organizational culture is an important element to unify diverse company cultures in the corporate group structure (Kenny, 2012). Corporate managers can establish an effective organizational culture to integrate organizational culture and improve performance. Successful cultural integration within the corporate group is an important element in maintaining successful communication and improving performance (Idris, Wahab , & Jaapar , 2015). It is necessary to establish an effective organizational culture in the corporate group to improve performance and productivity (Lee and Gaur , 2013).

The importance of organizational culture stems from its impact on the business and commercial results of a company. However, organizational culture can affect a company's business in both positive and negative ways. Understanding the impact of organizational culture on a company's responsiveness is critical to realizing its impact on fostering business innovation. To be successful in changing the organizational

culture that supports and enhances innovation, companies must have sufficient resources and opportunities in creating an organization that is characterized by strong teamwork, communication, trust, autonomy, knowledge transfer, personal creativity, risk tolerance, as well as other elements that are of great importance for the development, promotion and support of innovation. The coordination of employees in an organization is driven and facilitated by a strong and unique organizational culture.

Organizational culture is a good motivator. Employees want to satisfy all their needs in an organization, not only the material ones, but also the need to belong to a certain group and this is achieved if people identify with their organization. Employees are motivated when the business they do has meaning and significance to them. Organizational culture has a strong influence on the motivation of its members, but this influence can be both positive and negative. Culture can be an important motivator for mobilizing and channeling employee energy, but it can also be a negative factor, causing employees to give less than they really can. Culture has a positive impact if its content meets the needs and motivation systems of employees, and vice versa. A strong organizational culture creates a strong sense of belonging for employees to identify with the organization, leading to greater motivation to work and contribute, as well as higher productivity and job satisfaction. This work aims to analyze the degree of influence of the organizational culture and make recommendations for improvements applicable to the public and private sectors to increase the efficiency of the services provided and the organization in its clients or in the community.

2 METHODS

The interpretive paradigm belongs to the qualitative approach to research, understanding this as a set of beliefs that allow visualizing and understanding a phenomenon. This degree work belongs to the interpretive paradigm because, taking the previous paragraph as a reference, it is correct to affirm that this degree work seeks to analyze, understand and interpret the behaviors of the organizational culture in the success of companies.

Triangulation will be used in this research as a technique to analyze the information of this work, through this it is intended to contrast the data of the observed phenomenon, allowing to establish the corresponding comparisons, also allowing to evaluate the problem with amplitude.

Documentary research: It is a form of research that is based on texts, articles, bibliographies, videos, among others, based on existing topics of any topic, it is used to talk about a topic already discussed. Its main property is the fact of selecting and collecting information from texts and documents through reading, having a broader concept because it covers for this selection discs, tapes, microfiches and videos that provide great information thus providing results to the investigation.

The documentary research is integrated by several parts, it begins with a collection of data, then they are selected and analyzed to later be exposed in said investigation. This is how it is established to rediscover data that allows generating questions for research.

It must be established in an orderly manner composed with the most precise objectives possible, so that a good construction of knowledge can be based on it, the purpose of this research is to generate new knowledge, relying on others that are already done and that are relevant in their field, thus they can serve for the objective that is desired to be carried out. The documentary research technique requires a great capacity for analysis and reflection, since it must reconstruct in a very original way the information that is based on others, can be applied in any field and is made up of various methods to be applied.

Mainly, the bibliographic material of the topic to be investigated must be gathered, information must be obtained on the selected topic to investigate, then it is necessary to make bibliographic records that allow knowing everything related to the background for the topic to be treated; it is also key to make content sheets to capture the ideas that stand out the most and finally a type of scheme is made where interviews that provide more information are included.

3 THEORETICAL FRAMEWORK

According to Azhar (2003), organizational culture is the combination of important assumptions that are shared in common by every member of an organization and often go unexpressed. Organizational culture is basically made up of two main common assumptions: values and beliefs. Values are the assumptions that have been put forward by the organization's leaders and considered ideals that are desired by all members of an organization. Beliefs, on the other hand, are assumptions about reality and created by experience.

Robbins (1986), on the other hand, defines organizational culture as a uniform perception of an organization that has common characteristics. Organizational culture, according to the author, is somewhat descriptive and can effectively distinguish one particular organization from another. You can also integrate individuals and groups of organization systems.

Rousseau (2000) also defines organizational culture as a set of generally experienced stable characteristics of an organization that display unique characteristics that distinguish an organization from other organizations. Similar to Azhar 's (2003) definition mentioned above, Rousseau (2000) also defines organizational culture as a set of norms and values shared by individuals and groups throughout an organization. Organizational values and beliefs refer to shared ideas about what the common goals of the organization are and what types of behaviors members of the organization should follow to achieve the common goals of the organization. These organizational values, in turn, form the standard norms and guidelines that distinguish the organization from other organizations.

Schein (2004) also defines organizational culture as a pattern of shared assumptions that have been accepted by a group of people while solving their problems. Because they have used these assumptions to solve their problems and it works effectively, they accept these assumptions as valid and therefore teach them to new members of the organization as a standard way of thinking, perceiving, and solving problems.

Organizational culture is a phenomenon shared by the members of an organization that operates without knowing it.

In order to understand the full complexity of organizational culture, various researchers have made attempts to recognize and examine the components of organizational culture. One of the inseparable components of organizational culture are the values shared and maintained by individuals in an organization. Hofstede (2006), on the other hand, explains organizational culture in the form of an onion that contains a series of layers and values that constitute the core of organizational culture.

Numerous researchers have highlighted the importance of organizational culture for the success of the organization. For example, according to Azhar (2003), corporate culture can determine the success of the organization, in other words, good companies are distinguished from bad ones based on their corporate cultures.

The author further states that successfully managed companies generally have distinctive cultures based on which they are responsible for the successful implementation of their strategies. Every organization has its unique culture that has a powerful influence on the organization's employees and management team and can therefore be one of the most effective means of improving the overall performance of the organization.

Although it is somewhat intangible, it plays an important role in shaping the success of the organization and has a great influence on the employees. It is difficult to say that the organizational culture guarantees the success of the company, but companies with a strong corporate culture always have more opportunities to succeed than their competitors (Jarratt and O'Neill (2019).

Schein (2004) also highlighted the importance of organizational culture, who stated that culture can serve as both a strength and a weakness for the organization. For example, if it serves as a fortress, then it facilitates communication between members of the organization, facilitates the decision-making and control process, and creates commitment and cooperation within the organization. On the other hand, when many subcultures exist in an organization and only few values and norms of behavior are shared throughout the organization and traditions are rare. In organizations characterized by these traits, employees are more likely to be salaried rather than members of the organization, and therefore have less commitment and responsibility for their performance.

Organization elements that have a weak corporate culture include: bureaucracy instead of entrepreneurship and creativity, unwillingness to adapt best practices from outside the organization, politicized organizational environment, and hostility to change (Kotter & Heskett , 2019). In addition to that, Rousseau (2000) also states that it is important for the organization to recognize the fact that organizations do not improve in a vacuum environment and that they need human interaction to support improvement and development that can only be achieved by following the rules. values effectively accepted and equally shared by each individual member of an organization.

4 WHAT IS CULTURE?

Culture is the arrangement of different attributes that express an organization and differentiate the company from another (Forehand and von Gilmer, 1964). According to Hofstede (2019), culture is the collective thinking of minds that creates a difference between members of one group from another. According to Schein (1990), defines culture as a set of different values and behaviors that can be considered to guide success. According to Kotter and Heskett (2019), culture means a fairly established set of beliefs, behaviors and values of the society in general. In simple words, we can understand that culture is acquired knowledge, explanations, values, beliefs, communication and behaviors from a large group of people, at the same time and in the same place.

5 UNDERSTAND THE ORGANIZATIONAL CULTURE

The idea of culture must be learned and shared in organizations (Titiev , 1959). Pettigrew (1979) argues that organizational cultures are based on cognitive systems that help explain how employees think and make decisions. He also pointed to the different level of culture based on the multifaceted set of beliefs, values, and assumptions that determine the ways organizations can conduct business. According to Tichy (1982), organizational culture is known as "normative glue" means to hold the organization together in general.

The concept of organizational culture also provides a basis for determining the differentiation that can survive between organizations doing business in the same national culture (Schein , 1990). The concept of culture is generally used in the concept of organizations today (Kotter and Heskett , 2019). The organizational culture could be built by two essential factors of the social group; structural stability of a group and integration of a single element into a higher standard (Schein , 1995). Hodgetts and Luthans (2003) define the different characteristics associated with organizational culture.

Culture can be defined as a system of common values that people can be estimated to describe a similar organizational culture, even with different backgrounds at different levels within the organization (Robbins and Sanghi , 2007). According to Stewart (2010), he stated that the norms and values of the organization have a strong effect on everyone who is linked to the organization. He believes that standards are invisible, but if organizations want to improve employee performance and profitability, standards are the first places to look.

6 COUNTERCULTURE

Shared beliefs and values that are directly against the values and beliefs of the broader organizational culture recognized as countercultures, formed primarily around a forceful manager or leader (Kerr, J. and Slocum, JW, Jr. 2005) . The company can support this type of culture as long as it contributes positively to the improvement of the organization's performance. But it is considered a danger to the original organizational culture.

7 SUBCULTURE

According to Schein (1995), subculture are the segments of culture that exhibit different norms, values, beliefs, and behaviors of people due to difference in geographic areas or departmental goals and job requirements (within the organization). Employee perceptions of the subculture were related to employee commitment to the organization (Lok, Westwood, & Crawford, 2005). Some groups may have a similar enough culture within to allow for social interaction outside of the workplace.

8 STRONG CULTURE

The culture of the organization is considered strong, where most of the employees have the same type of beliefs and values as the organization. The culture of the organization is believed to be strong, where most of the employees embraced the same type of beliefs and values that the organization was concerned with (Deal and Kennedy, 1982). They agreed that managers should try to bridge the gap between employees to develop a strong relationship. The management also considered that the employees are more important than the rules of the organization.

9 WEEKLY CULTURE

A weak organizational culture could be one that is loosely knit. At some point it can drive individual thinking, contributions and in a company that needs to grow through innovation, it could be a valuable asset, at some point not. According to Deal and Kennedy (1982), a weak organizational culture could be one of loose joining. Rules are strictly enforced on employees that can create diversity between the person's personal goals and the goals of the organization.

10 CHARACTERISTICS OF ORGANIZATIONAL CULTURE

According to Dasanayaka and Mahakalanda (2008), maximizing employee values are considered rational assets that require a culture to support their logical engagement for both individual and organizational learning, new knowledge formation, and willingness to share with others. Schein (2019) says that organizational culture is very important today compared to the past. Hodgetts and Luthans (2003) define some of the characteristics of organizational culture:

1. Standards are measured by things like the amount of work done and also the level of cooperation between management and employees in the organization.
2. Clearly, rules are defined for employee behavior associated with productivity, intergroup cooperation, and customer relations.
3. Observed behavioral regularities, as illustrated by common language and formal procedures.
4. Coordination and integration between the organizational units with the purpose of improving the efficiency of the works, the quality and speed of design, manufacture of products and services.

11 DIMENSIONS OF ORGANIZATIONAL CULTURE

Hofstede (2019), used the data collected from IBM employees in more than 50 countries and classified the organizational culture in four dimensions;

- Power distance (the degree to which employees and management have a distant relationship, formal and informal)
- Individualism (the degree to which people can create differences between the interest of the organization and their own interest)
- Uncertainty avoidance (the level at which people are willing to mitigate uncertainty and tolerate ambiguity)
- Masculinity (the level at which success is defined as ambition, defiance, and insolence, rather than care and promotion)

Later, in a study by Hofstede & Bond (1998), the fifth dimension of short-term versus long-term orientation was added which was based on the study among students from 23 countries with the help of the questioner. Academics and professionals related to the field of organizational behavior have a strong criticism of Hofstede's study (Sondergaard , 1994).

Schwartz (1994) builds a cultural value that means the relationship between cultural factors and personality in the organization. He developed a model that builds on the studies by Hofstede (2019) and collected data from respondents in 38 countries. He fined two different dimensions of culture; affective and intellectual and self-improvement versus self-transcendence. He classifies the cultural standards of societies into contract culture and relationship culture on the basis of life and work. According to the study carried out by Trompanaars (1993), 30 companies in 50 different countries participated, they identified seven dimensions of culture that are universalism versus particularization; diffuse versus specific, neutral versus emotional, individualism versus communication, ascription versus achievement, attitude towards time and the last one is the attitude towards the environment. This seven-dimensional model may be compatible with Hofstede's model.

12 CONCEPTUALIZATIONS OF THE CULTURE OF ORGANIZATIONS

According to Alvesson (2018), the conceptualization of the organization's culture depends on the scale of two extremes:

- Process-oriented approach
- Classification approach

13 PROCESS-ORIENTED APPROACH TO ORGANIZATIONAL CULTURE

According to Roskin (1986), this approach shows organizational culture as a permanent response to collective meaning. Schein's (1990) organizational culture model represents this approach and describes organizational culture as a framework of fundamental assumptions invented or developed by a specific group to learn about the specific problem and worked well enough to be considered adequate.

He defines the three levels of culture; behaviors (creating the social and physical environment), values (underlying the meaning by which the contours of artifacts are interpreted), and basic assumptions (unconscious level of behaviors that are more difficult to learn or change).

13 ORGANIZATIONAL CULTURE CLASSIFICATION APPROACH

In accordance with this organizational culture, converse with a range of ideas that can be mimicked by two or more variables. From this approach, numerous quantitative methods are used to measure the culture of the organization (Rousseau, 2017), the development of the questioner on the basis of the typology of culture. One of the most popular conceptualizations of culture is to be understood by the onion model. Organizational culture is considered as onion based on different layers. Norms and values are the invisible but most important aspect of organizational culture. We can observe many cultural signs, artifacts and patterns of employee behavior.

14 THE CONCEPT OF SUCCESS

Success refers to the degree of achievement of the mission in the workplace that accumulates the work of an employee (Cascio , 2006). Different researchers have different thoughts about success. Most researchers used the term performance to express the range of measures of transactional efficiency and input-output efficiency (Stannack , 1996). According to Barney (2017), performance is a continuous process, a controversial topic among researchers in the organization.

Organizational performance means not only defining the problem but also solving the problem (Hefferman and Flood 2000). Daft (2000) said that organizational performance is the ability of the organization to achieve its objectives effectively and efficiently using resources.

Like Daft (2000), Richardo (2001) said that the achievement of the organization's goals and objectives is known as organizational performance. Richardo (2001) suggested that the success of organizations shows a high return on capital and this is made possible due to the establishment of the performance management system of good employees.

15 STRATEGIC PERFORMANCE MEASUREMENT SYSTEM (SPMS)

It is very important for organizations to make a performance measurement system to assess the performance of employees, which is very useful to assess the achievement of organizational goals and to develop strategic plans for organizations (Ittner and Larcker , 1998).). Organizations today focus more

on managing non-financial or intangible assets such as customer liaison, services, quality, and performance, not on assets that are financial in nature (Kaplan and Norton, 2001).

Therefore, there is a need for a proper performance measurement system to measure and evaluate the performance of employees, be it financial or non-financial. The Strategic Performance Measurement System (SPMS) is a new approach to measuring performance instead of the traditional one. Chenhall (2005) said that the SPMS provides a way to translate and measure financial and non-financial performance. It also suggests that it is the integrative nature of this measurement technique; Provide the potential to increase the strategic competitiveness of the organization.

Like Chenhall (2005), Vein , Burns, and McKinnon (1993) agreed that the use of multiple consistent financial and nonfinancial performance measures is generally in the best interest of the owner and management, which is helpful in improving performance. protection against uncontrollable events outside organizations.

Kaplan and Norton (2019) suggested that Balance Scorecard (BSC) is one of the most important SPMS tools. Balance Scorecard provides help or framework to ensure that strategy is interpreted into a rational set of performance measurements. Linked together in a causal relationship, it encompasses four main viewpoints such as: financial, internal business process, customer, and learning and growth. The modal "Balance Scorecard " is a cooperative tool to focus on the organization, improve communication, set the organizational objective and give feedback on the strategy (Anthony and Govindarajan , 2003).

16 IMPACT OF ORGANIZATIONAL CULTURE ON PERFORMANCE

Denison (2017) used data from 34 US companies on cultural performance over a five-year period and examined characteristics of organizational culture and tracked performance over time in these companies. According to Reichers and Schneider (1990), who stated that culture researchers have committed several studies to culture definitions, relatively few researchers have contributed to culture and performance research. The only reason to do so was the complexity in the operational concept of culture construction. According to Kotter and Heskett (2019), investigate the relationship between long-term organizational performance and economic performance in more than 200 organizations. Furthermore, being one of the most important and thorough research efforts on this topic, the study has organized three vital contributions. First, the relationship between culture and performance established in their research is compelling. Second, the writer offers an important combination of theoretical views on the nature and scope of culture. Third, they outline strong associations between culture, management practices, and performance.

The claim that organizational culture is linked to performance begins with the apparent role that culture can play in causing competitive advantage. Rousseau (1990) studied to overcome some of the limitations in measuring organizational culture. In the end, the results show that there are no positive correlations between culture and employee performance.

After critically reviewing recent research methodologies and findings, it is assumed that there is a link between culture and performance (Lim, 1995). Theorists also hold that sustainable competitive advantage arises from the formation of organizational competencies that are superior to and incorrectly imitated by competitors (Saa-Pe're and Garcia - Falcon, 2019). Practitioners and academics have suggested that an organization's performance depends on the degree to which the values of the culture are shared in an integrated manner (Denison, 1990).

Organizational learning as a management style and new demands on the environment is up to date to some extent, which could lead us to assume that older companies are less culturally oriented towards learning. If older people's organizations made a culture of organizational learning, they do hard work to alter their culture, then it's not an easy task, it's not a linear or quick process. At the same level, nothing better than citing an ironic expression (Schein , 1997).

According to Saffold (1998), first of all, culture can shape organizational processes, which again helps to create and modify culture. Second , the contribution of culture to performance is likely to be significantly less demanding than many studies imply.

Most successful writers and managers suggest that a strong organizational culture is very essential for business because of three important functions: First, organizational culture is extremely fixed with social control that can influence employee decisions and behavior . Second, organizational culture works as a social glue to bind employees together and make them feel like an important part of the corporate experience, which is helpful in attracting new staff and retaining the best. Third, organizational culture is very useful in helping the process of making sense, it helps employees understand organizational events and goals, which improves employee efficiency and effectiveness.

Strong culture has almost been considered as a driving force to improve employee performance. It improves employee self-confidence and commitment and reduces job stress and improves ethical behavior of employees (Saffold , 1998). In addition, he states that most studies on culture tend to emphasize a single organizational culture. But in Deal and Kennedy's (1982), the strong and weak culture point of view has a great impact on organizational behavior, but in the strong culture, the goals of the employees are on the side of the management goal and are useful for increasing the overall performance of the organization.

According to Barney (2017), the organization provides a sustainable aggressive advantage. He introduced three conditions; First, it suggests that the culture must be viable, second, the culture must be rare and have attributes, and the third culture must be imperfectly imitable. These can provide support for superior organizational performance that can be temporary or continue long-term. Long-term increase in organizational performance can lead to long-term competitive advantage. Kotter and Heskett (2019), carry out a study and find that the organizational performance that increases the culture or the strong culture increased the income of the organizations up to 765% between 1977 and 1988, and only a 1% increase in the same period of time, companies without a culture of performance improvement (Gallagher, 2008).

17 THE IMPACT OF CULTURE ON COMPANY INNOVATION

An element of a company's organizational culture is an innovation-oriented culture, which includes: innovation-oriented motivation, innovation capabilities, behavior in an innovation environment, and management style and quality that determine the innovation climate. An innovation-oriented culture can be defined as the need to generate the greatest number of innovative ideas in a given period of time. A culture of innovation is a way of thinking and acting within a company that creates, develops and establishes values and attitudes, which in turn generate, accept and support ideas and changes that mean an improvement in the operations and efficiency of the company. . company, despite this change. It can mean conflict with tradition and traditional behavior.

Building an innovation culture must meet certain requirements, which involve six attitudes: managers' ability to take risks, encourage creativity, full participation in building an innovation culture, and managers' sense of responsibility. and employed by themselves. Action that allows employees to develop their interests and develop their unique talents, develop the mission of the company and employees will identify with it; make employees feel that their work has meaning and has a positive impact on the achievement of goals (Claver, 1998). Maher identified seven key cultural dimensions that differentiate highly innovative organizations. These form the framework that leaders can use to assess and strengthen the culture of innovation within and across organizations:

- Employees must feel that they can try new ideas without fear of the negative consequences of a bad idea; leaders of innovative organizations should be more interested in learning "from mistakes" rather than punishing employees for ill-advised ideas; preferably it is when an idea is implemented that mistakes are made, not because there are no ideas without mistakes.

- Positive innovation approaches can be enhanced if employees know that they have superior support and independence of action in developing innovative ideas, and that they have access to financial resources to support the innovation process;

- Knowledge is the main resource for innovation, it creates better conditions for innovation, it collects information from inside and outside the organization in a comprehensive and systematic way, accesses it easily and quickly, and communicates it clearly;

- Relevant literature shows that goals can foster innovation; Organizational leaders must clearly state that innovation is highly desirable, set ambitious goals in different areas, and build motivated teams to find ways to achieve the vision;

- Innovation supports are symbols and rituals whose main objective is to identify innovative behavior, and incentives for such behavior are symbols and rituals that refer to the internal and individual motivations of individual employees;

- In an efficient organization based on innovation, innovation is the product of the expected use of practical tools, leaders must consider how to develop the potential and capabilities of employees who understand ways of thinking creatively, managing and implementing ideas;

- The relational dimension, which refers to the patterns of interaction within an organization; Innovative ideas are rarely the product of a lone genius, so creating collaborative environments that embrace different ways of thinking, different perspectives, and diversity provides a good place for innovation to grow.

Level of education and general management, economic and social knowledge, effective communication systems in organizations, ambition and competitive environment, incentive programs, free exchange of innovative ideas (ideas), lack of arrogance and selfish attitude, proclaim successful authors and those who help. in this process (Perenc, Holub-Ivan, 2011). Characteristics of organizational cultures that support innovation include: creating an atmosphere conducive to organizational change, developing and sharing knowledge and skills, tolerating risk, uncertainty, and novelty, implementing democratic principles of decision-making and conflict resolution, support group activities and create recognition and an environment of respect for innovators, supporting creative thinking and problem solving (Gadomska-Lila, 2010: 14). Leading innovation excellence has a lot to do with how leaders create a culture where innovation and creativity flourish in every corner.

18 RESULTS AND DISCUSSION

When considering the implementation of innovations, companies typically focus on resources, processes, and measures of success—the easy things to measure. Companies tend to pay less attention to the human-centric determinants of innovation culture, which are more difficult to measure, such as values, behaviors and organizational climate.

While everything related to the values and behaviors of people and the work environment is more intractable and unmanageable, it is these "puzzles related to people" (as one president put it) that have the greatest shaping power to be oriented to innovation. culture to create a sustainable competitive advantage.

The organizational culture can be a favorable factor in the development of innovative activities. It is of the utmost importance to adequately shape an organizational culture that supports innovation from the perspective of the competitiveness of each company, since innovation is often a determinant of its competitive position in the market. A single common organizational culture model could not be identified for the companies associated with the respondents. However, the elements that make up a culture that supports innovation have been identified. They appear in most companies with different intensity, namely:

- A management style that emphasizes tasks and interpersonal relationships.
- The important role of managers in stimulating innovation and motivating employees to innovate .
- Stimulate the creativity of employees.
- employees feel less dangerous due to the changes implemented by the company.
- Adequate organization of work and working conditions aimed at stimulating the creativity of employees.

- support new concepts and ideas.

- Employees are free to express their opinions, propose and support new ideas, and employees from different organizational units collaborate.

Each person or employee in the organization has their own different values and beliefs that he/she works with. Every time he/she joined any organization, he/she allowed himself/herself to internalize first with the culture of the organization to know if they came up with it or not. Culture is being investigated to impact the mix of organizational processes. Organizational culture has a profound impact on employee performance which can cause improvement in productivity and improve organizational performance. More than 60 research studies were conducted between 1990 and 2017, covering more than 7,600 small business units and companies, to discover the cultural impact on organizational performance (Gallagher, 2008).

The results of these studies mainly show a positive association between a strong culture and improved performance. Based on this study, we can conclude that organizational culture has a positive impact on employee job performance. Research shows that each individual in the organization has a different culture and he/she first tries to fit it with the norms and values of the organization. Adopting the culture of the organization is helpful for the employees to get their work done efficiently and efficiently.

According to Gallagher's 2008 study, employee performance caused the organization's net profit to increase.

Positive development is easier to achieve when everyone is on a common path in the organization. In this particular study it is seen that a strong organizational culture is very helpful for the new employees to adopt the organizational culture and gain the competitive advantage under the particular conditions. On behalf of previous studies, it is shown that employee engagement and group efficiency play a crucial role in embracing organizational value and beliefs and improving organizational performance. This study is based on the literature; Further research can be done empirically to understand the nature and power of organizational culture in influencing organizational performance.

19 CONCLUSION

Organizational culture is something that evolves over a period of time. Organizational culture is a very complex issue and can be very difficult for managers to control. It is also very difficult for managers to change the culture in the organization because it requires a lot of time and a deep understanding of the history of the organization.

Organizational culture is important to managers and is something that cannot be ignored. Behavior is critical for managers and change management, therefore, for an organization to be compliant and effective in today's competitive business world, they must take the concept of organizational culture very seriously.

In general, understanding the culture of an organization can help understand why change is not happening or why a project is not successful. Understanding the culture can also help determine where to

make changes. Making changes to the culture of an organization can determine the survival of the organization; therefore, modifying a culture can be tricky and should be approached with caution.

Strategic management and organizational culture are inseparable. They influence each other, strategy innovation and organizational culture synchronization innovation. Organizational culture is very important, but many companies are just a mere formality, and many companies fundamentally have no culture.

At the same time, the company must understand and grasp the complementary relationship between strategic management and organizational culture can help improve the overall quality and competitiveness, promote access to quality, sustained and healthy development.

Companies for long-term development, we must have a development strategy, corporate culture and corporate strategy are closely linked. On the one hand, to a large extent it can be said that culture determines strategy, which can be divided into two levels to recognize each of the levels to the corporate mission to provide the basis for the formulation of corporate strategy. The implementation of the corporate strategy of each stage in order to achieve the strategic goals of each stage of the company, and the company by the realization of the strategic goals of each stage, ultimately all in pursuit of the mission of the company. So the business culture is the business mission to provide the fundamental basis for the formulation of business strategy, strategic business management framework, the mission to guide the strategic objectives and strategic goals to guide the entire strategic program is finalized.

From another level, in each industry there is an industry culture, and they tend to have a more significant difference in culture between the industry, like the culture of the manufacturing sector, there is the industry itself, in terms of management, it can be more strict focus on quality management, production efficiency, discipline, and some emerging industries, such as the characteristics of the IT industry to focus on a more relaxed environment, focus on employee innovation, focusing on the mutual exchanges.

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CHAPTER 84

Assessment in emergency remote teaching: an analysis of an assessment instrument in digital format

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ABSTRACT

Evaluation is an important and founding part of the processes of teaching and learning, taking this into account, this work is resultant from inquiries and reflections concerning evaluation during remote teaching. To address this issue, theoretical research was carried out about essential concepts related to evaluation. Due to the Covid-19 spread and the necessity of social isolation, emergency remote teaching was a path full of challenges and learning opportunities both for teachers and students. This study can be defined as experimental and applied research, using quantitative and qualitative analyses of the data obtained from Google Forms, which was the evaluation instrument chosen at the end of the didactic sequence project. The results indicate that evaluation should be done during the whole teaching and learning process and that the overall performance of students must be considered. This research also points out the advantages and disadvantages of digital evaluation instruments in emergency remote teaching.

Keywords: remote teaching; learning; evaluative instruments; Google Forms; evaluation.

1 INTRODUCTION

One of the great challenges in the educational area has been to incorporate new technologies in the teaching and learning processes. With the outbreak of the Covid-19 pandemic, this challenge became blatant, as teachers had to make use of digital information and communication technologies to develop their classes. In this context driven by disease and necessity, with the restrictions imposed on social interaction, digital information and communication technologies became part of the daily lives of many teachers and what came to be called remote teaching, a new terminology for teaching, emerged. developed remotely through digital information and communication technologies, using digital artifacts such as computers, cell phones and the internet.

In this context of remote teaching with the use of digital technologies as a way of simulating reality and social interaction made impossible by the high risk of contamination of the Covid-19 pandemic, the research questions that guide this work emerged: how to evaluate learning during teaching remote? What are the advantages and disadvantages of digital assessment instruments used in emergency remote teaching?

Therefore, the objective of this work is to analyze the advantages and disadvantages of digital evaluation instruments of the results of these instruments obtained through an applied research, which follows a quantitative and qualitative approach.

The research was carried out in two distinct phases: first, a didactic sequence was elaborated with the theme "chocolate" that was applied as an extra activity during remote teaching, the culmination of this didactic sequence was the application of an instrument to assess the understanding of a text oral language in English built as a *Google Classroom form*. In the second phase, the collected data were analyzed quantitatively and qualitatively. Both phases were carried out in a public school in the state network of Minas Gerais with high school classes.

This research was developed as a conclusion work for the specialization course in basic education teaching at the Federal Institute of Minas Gerais, Arcos campus; and was carried out without funding from research funding agencies.

This work is organized as follows: after this introductory section, there is the methodology section that describes methods, approaches and procedures used in the execution of this research. Then, the theoretical foundation based on concepts and principles about assessment in education, assessment instruments, project pedagogy, didactic sequence, English language teaching during remote teaching and during face-to-face teaching is presented. Soon after, the data obtained in this research are presented, analyzed and discussed in the light of the theories selected in the theoretical foundation section. Finally, the final considerations of the work and the references used in this article are presented.

2 METHODOLOGY

This research was the result of a course conclusion work of a specialization in teaching in basic education. In the first phase of the research, a pedagogical practice was carried out in the English language classes of a public school in the State of Minas Gerais, through the application of a didactic sequence composed of teaching activities and learning assessment instruments, in order to evaluate the results of an evaluation instrument applied through Google forms, still in the context of the Covid-19 pandemic, at the end of 2021.

In view of the characteristics of this research, it can be defined as an exploratory research, since there is still little knowledge built on assessment and assessment instruments in remote teaching; at the same time that this research is also explanatory, in the attempt to provide data and clarifications about a certain phenomenon. In addition, this research can still be classified as an applied research, as a pedagogical proposal is presented, which is put into practice to obtain and analyze the results of this pedagogical practice (BRASILEIRO, 2021, pp. 76-77).

In order to fulfill the scope of surveying the phenomenon investigated, a bibliographic review was carried out, based on the reading and recording of materials published in books, specialized journals, electronic and digital information networks (cf. MARCONE and LAKATOS, 2001).

During the first phase of the research, due to social isolation and emergency remote teaching, data were collected mostly through Google forms, within the Google Classroom educational platform, as it was the platform used by the school. Google forms were designed as a “structured instrument in a series of questions” (BRASILEIRO, 2021, p. 84). Google forms allow the collection of quantitative and qualitative data.

In the second phase of the research, after the collection procedures, the data were tabulated, classified and categorized according to their quantitative nature and qualitative analysis methods, so that this research makes use of the quantitative approach related to the qualitative approach.

Due to feasibility and time issues, data related to an assessment instrument used at the end of a listening comprehension activity in English will be presented and analyzed. These data were tabulated, classified, categorized and checked by two researchers and will be presented in the results presentation and data discussion section.

3 THEORETICAL FOUNDATION

3.1 GENERAL PRINCIPLES AND CONCEPTS ABOUT ASSESSMENT

One of the questions of this research is directed to how to assess learning during the emergency remote teaching regime, which leads to a reflection on the learning assessment process. This question about what is evaluation and how to evaluate, leads us to a long and recurring debate in the educational field about the importance of evaluation, the attempt to overcome the merely quantitative aspect and the exclusively classifying view that has been related to the process of evaluation. assess learning. As Luckesi (1999, p. 18) criticizes: “Our school pedagogical exercise is crossed more by a pedagogy of examination than by a pedagogy of teaching/learning.” A starting point for changing this perspective would be the understanding of evaluation as one of the “constitutive elements of the teaching-learning process”, as Luckesi (1999) says. In this way, assessment, understood as a process and not just as a result, cannot occur in isolation, dissociated from everyday school life.

Thus, evaluation can be understood as part of the teaching and learning process, which takes place continuously in the educational process, because as highlighted by Valadares and Graça (1998, p. 12):

a central role in the entire educational experience, as it allows us to know the situation of the student in the different stages of his cognitive evolution and to base decisive value judgments, not only for the improvement of his learning, but also for the valorization of future educational experiences (emphasis by the authors).

Understood in this way, assessment permeates any and all educational experience. Such experiences should be promoted in order to develop meaningful learning, which according to Ausubel et al. (1980), it can only be so conceived if the student learns “significantly new ideas if, and only if, these are incorporated “in a non-arbitrary and substantive way” in their cognitive structure”. Roughly speaking, paraphrasing Ausubel et al. (1980) meaningful learning occurs when students appropriate knowledge and this knowledge

becomes part of their cognitive structure. According to Valadares and Graça (1998) significant learning cannot be confused with active learning (when the learner actively participates in the construction of knowledge), nor with discovery learning (when the learner discovers something by himself, without the help of others).

Given the inherent complexity of the evaluation process, a great challenge for teachers and educators would be how to evaluate, which procedures or instruments to use, since the evaluation process permeates the educational process. To be clear about how to evaluate, it is necessary to know: 1) the general principles of evaluation; 2) the characteristics of the evaluation process; 3) the types of assessment. Such information will be presented in summary tables :

Table 1: General principles of evaluation

General principles of evaluation	
<ul style="list-style-type: none"> • Assessment is an integral part of the teaching-learning process. • Evaluation requires a prior and clear definition of what is intended to be evaluated and the purposes in view. • Evaluation requires the choice of various evaluation techniques and instruments depending on the objectives and purposes. • Evaluation requires taking advantage of the strengths of each assessment instrument and minimizing the effect of its weaknesses. • Assessment is a necessary means to an end (improvement of student learning) and not an end in itself. 	

Source: Valadares and Graça, 1998, p. 44.

Table 2: Characteristics of the evaluation process

Characteristics of the evaluation process	
<ul style="list-style-type: none"> • It is intrinsically a continuous, systematic, subjective and prescriptive process. • It depends on the objectives and the context in which it takes place. • It is multiform (tests, ranking lists, grading scales, interviews, questionnaires, portfolios, concept maps, Gowin's visions , ...). • It adapts to the most diverse purposes (curricular, teaching, selection , classification, placement, personal, etc.). 	

Source: Valadares and Graça, 1998, p. 46.

Table 3: Types of assessment

Assessment classification according to the role it plays in teaching:	
prior assessment	To determine where each student should be integrated when starting a new phase of their learning
diagnostic evaluation	To diagnose student learning difficulties during this
Formative assessment	To assess the student's learning progress during this
formative assessment	Contributes to the student learning to learn
Summative evaluation	To assess student achievement at the end of a phase of their learning

Source: Valadares and Graça, 1998, p. 47.

As can be seen, the evaluation process should integrate general principles in the formulation of evaluations, integrate different evaluation instruments and different types of evaluation. In other words, the evaluation process should be more eclectic and not just synthesized in a single moment of the test or test, which are usually formulated to be a summative evaluation or the result of the end of an evaluative stage.

In addition to this inherent complexity of the assessment process, the context of the Covid-19 pandemic imposed another challenge that would be to propose the adaptation of the teaching, learning and assessment processes for emergency remote teaching. Technological advances have significantly impacted

educational means and processes, evaluation has also undergone these changes, the use of digital platforms, which was already large, was intensified by the pandemic context, which required the use of new evaluation instruments and a readjustment of evaluation processes. for *online* platforms and environments .

3.2 COVID-19 PANDEMIC AND THE IMPACTS FOR EMERGENCY REMOTE TEACHING AND TEACHING, LEARNING AND EVALUATION PROCESSES IN EDUCATION

Fernandes, Isidorio and Moreira (2020) indicate that the coronavirus pandemic suddenly and untimely brought major impacts to the educational scenario: specific legislation on emergency remote teaching was introduced; educators, teachers, students and parents had to adapt to a reality of social isolation, interaction mediated by digital technologies and emergency remote teaching; there was no time to train teachers for the new reality; public policies were not implemented to assist teachers and students with regard to access to digital technologies. In this scenario, in which everything was done in a hurry, in a contingency and emergency way, there were limitations but there were also significant progress in the educational area.

Continuing, Fernandes, Isidoro and Moreira (2020, p. 3) explain that emergency remote learning should not be confused with Distance Learning (or EAD), since remote learning:

differs from Distance Learning (EAD) by the fact that in Remote Learning, the student has a synchronous follow-up by the teacher, that is, teachers and students can, through digital means, achieve the necessary interaction for the application of the class at the time of face-to-face classes . In addition, the student has instant feedback from the teacher of the discipline in real time, in most of the digital resources used, the teacher can reproduce the notebook screen and various media files, whether Powerpoint or videos.

As the name implies, emergency remote teaching was introduced in order to solve an urgent problem, which was the reestablishment of teaching and learning processes remotely for students, who until then had been without classes due to the pandemic and the high contagion of the virus. coronavirus. EAD is a form of education that serves students who choose this modality, by offering distance learning activities, tutored or self- monitored , in which the student has greater autonomy to learn through instructional material properly prepared for distance activities.

Having made these reservations, it is necessary to consider that in the context of emergency remote teaching, teachers and educators, with little or no training, had to readjust teaching, learning and assessment processes that were previously carried out in person, to be developed on online platforms. , like Google Classroom or Microsoft Teams , for example.

For Casatti (2020, sp), the pandemic accelerated the process of integrating digital technologies into the educational scenario, creating opportunities

for the digital and cultural transformation that is so necessary in teaching, uniting innovative pedagogical practices, such as hybrid learning and active methodologies, with intelligent educational technologies, which enhance the abilities of the student to learn and the teacher to innovate.

It is in this context generated by the pandemic that teachers are challenged to use digital technological tools that until then were used rarely or sparingly, such as videoconferencing or video calling programs and applications (such as Google Meet, Zoom); digital forms (like Google Forms); use Youtube videos as an educational resource; use virtual learning environments (VLE) to provide class materials; among other possibilities and innovative solutions.

Souza and Souza (2016) indicate that Google Classroom (or Google Classroom) is an online teaching platform or a virtual learning environment (VLE) that contains several tools that can be used for online teaching and learning processes. , such as Google Meet (program for videoconferencing, video class); Google Drive (repository of documents that are saved in the cloud); Google Docs (a program that allows the creation, editing and archiving of various types of files); Google Forms (a program that allows the creation of forms, very useful for creating tests and online tests); among other programs and resources that can be used for educational purposes.

Online activities can be organized in a didactic sequence (DOLZ, NOVERRAZ and SCHNEUWLY, 2004, p. 97) linked to the pedagogy of projects (GIROTTO, 2005; CIEB, nd). In the case of teaching English, the didactic sequence can be organized around written, oral, and also multisemiotic textual genres , according to the guidelines of the National Common Curricular Base (BRASIL, 2018), which will be discussed in the next section. theoretical section.

3.3 TEACHING SEQUENCE

The Didactic Sequence “Chocolate” was elaborated from the need to work the four language skills (reading, writing, listening and speaking) in English classes in a public school, in basic education, more specifically in high school, taking into account into account what the National Curricular Common Base (2018) proposes, with regard to the teaching of

competencies and skills that [...] enable [young people, students] to mobilize and articulate knowledge of these components simultaneously with socio-emotional dimensions, in learning situations that are significant and relevant to their integral formation (BRASIL, 2018, p. 481)

In this sense, the activities proposed in this didactic sequence were designed based on the need for the target audience, that is, public school English language learners, to work with English language skills and abilities that prepare them for meaningful language learning. English, the socialization of the English language and social interaction through language.

In this way, the written, oral and multisemiotic texts selected to integrate this didactic sequence were proposed with educational purposes that lead to “the consolidation and expansion of the skills of use and reflection on languages” (BRASIL, 2018, p. 482) .

With regard to the preparation of the didactic sequence, the theoretical principles of Dolz , Noverraz and Schneuwly (2004, p. 97) were used, which define the didactic sequence as a “set of school activities organized, in a systematic way, around a genre”. oral or written text”. In this case, we extend the understanding of textual genre (MARCUSCHI, 2008), which is not limited to oral or written texts, but also encompasses multisemiotic texts , in which there is the presence of more than one semiosis or way of producing meanings. Videos, for example, can encompass several semioses and can be considered as multisemiotic texts .

3.4 PROJECT PEDAGOGY

According to Hernández (1998) , Hernández and Ventura (2000), Girotto (2005), project pedagogy emerged from the need to break with the traditional teaching vision, based on memorization, repetition and fragmentation of knowledge into stagnant disciplines, bringing a new way of pedagogical practice based on problem solving, on the integration of lived practices with classroom practices. Thus, for Hernández (1998) the work projects innovate the pedagogical posture, insofar as they bring a new way of understanding and experiencing the educational process, due to the challenges and problems faced by today's society.

The conception of project pedagogy, according to Girotto (2005) is a resignification of the school vision, essentially interdisciplinary and has as its starting point real demands of the context in which it is inserted, has in the teacher a role of mediator and encourager of learning actions. The term has a strong influence on the defenders of the so-called “Active School” whose main representative is Jhon Dewey.

The project to be developed is immersed in dialogue, exchanges and debates between students and teachers. It arises from a need, a guiding problem, which encourages searches, research and resolute actions. Students and teachers work collaboratively, the work can involve several disciplines, the pedagogy of projects intends to go beyond the delimited vision of the curriculum.

The student is given the opportunity to act in their learning process, in the pedagogy of projects, the active and conscious participation of each individual is demanded, with their previous knowledge and their individual contributions, which give rise to a transforming education and significant learning (cf. CIEB , nd).

The design of the project requires planning and a clear objective, although it has the flexibility to adapt to the needs and experiences over the period. The evaluation is a primordial part, because it will happen all the time, verifying participations and actions in a quantitative way, but above all qualitatively. At the end of the project, it is hoped that learners will reach an understanding of concepts and contents , and be aware that practical actions can transform society.

Based on the theoretical principles of project pedagogy and the organization of the teaching and learning process, teaching activities and assessment instruments were developed to teach English language to high school students in a public school, in the context of the pandemic, thinking- if in a differentiated education, with active participation of the students, and that could contribute to significant learning. The pandemic context was challenging for teachers and students, and with regard to teaching English, the challenges seemed to be greater because teaching language involves teaching language skills (reading, writing, listening, speaking) and intercultural understanding, since the English language is used worldwide by speakers of diverse cultures.

3.5 ENGLISH LANGUAGE TEACHING IN THE PANDEMIC CONTEXT

Considering the context of the Covid-19 pandemic, English language teachers found limitations in the teaching platforms provided by city halls and state governments. English language tasks were often designed just to work on reading and writing skills, with speaking and listening comprehension skills being little worked or being left out. Some English language teaching theorists indicate that the four language skills (reading, writing, speaking and listening comprehension) must be worked on for students to develop the ability to communicate in the foreign or additional language they are learning (CELCE-MURCIA, 2012; GOWER; PHILLIPS; WALTER, 2005; HINKEL, 2010; WATKINS, 2005, among others).

Therefore, considering the pedagogical possibilities of using the Google Classroom platform and the need to work on language skills to develop the communication skills of basic education students, especially, the English language teacher can use the Google Room platform. Classroom as an educational resource, as a digital information and communication technology. In fact, the National Common Curriculum Base in the area of Languages indicates that teachers should work with digital technologies in order to develop students' communication skills and competences (BRASIL, 2018).

Therefore, the “Chocolate” Didactic Sequence project was designed to integrate various language skills, present in different textual genres, both written, oral and multisemiotic, in order to contribute to the learning of the English language, as well as for students to apprehend the intercultural dimension of the English language, which is used by different peoples and cultures around the world.

4 DATA PRESENTATION AND DISCUSSION

The “Chocolate” Didactic Sequence was designed to work with all language skills in English (reading, writing, speaking and listening), within a project pedagogy model, whose culmination was a teaching activity developed in Google Forms (Google forms) to assess the listening comprehension of high school students in a public school.

The project arose from the students' questions about how chocolate was made and why chocolate was so consumed all over the world, in view of this problem posed by the students themselves, a project was developed, based on the didactic sequences (DOLZ, NOVERRAZ and SCHNEUWLY, 2004, p. 97),

integrating different textual genres (MARCUSCHI, 2008; BRASIL, 2018). The project integrated to the Didactic Sequence “Chocolate” was planned to be developed in six remote classes, which depend on the active participation of students, as foreseen by the pedagogy of projects (HERNÁNDEZ, 1998; HERNÁNDEZ and VENTURA, 2000; GIROTTO, 2005) and the teacher mediation.

It was explained to the students that the participation in the project and the execution of the activities would occur on a voluntary basis and that the data generated would be used in research on English language learning and assessment, guaranteeing the right to anonymity as well as the right to withdraw from participating in the research. at any time, following ethical precepts in research (PAIVA, 2019).

Initially, 58 students participated voluntarily in the research. During the classes, some students voluntarily decided to withdraw from the research and, in the last remote class, 38 participants remained (32 female students and 6 male students). As all classes contained evaluation, as we understand that the evaluation process takes place in a procedural way (LUCKESI, 1999; VALADARES and GRAÇA, 1998), in view of space restrictions, we will present in this article only the data collected in the culmination activity of the Sequence Teaching “Chocolate”. In this activity developed in Google Forms (Google forms), students were asked to watch a video in English, embedded in the form itself. Students could watch the video as many times as they wanted, before answering the questions on the form. This activity did not have any kind of score or reward, avoiding the pressures of the exam and the final grade that Luckesi (1999) criticizes; that is, the students did the activity with the motivation to learn and without the pressure of achieving a grade to pass the bimester.

In the Google form, the video about the history of chocolate (<https://www.youtube.com/watch?v=ibjUpk9Iagk>) was embedded in the form. The video was chosen due to the theme of the proposed didactic sequence and because it is a multisemiotic text , which conveys written and oral information, moving images, which is in accordance with the BNCC proposal to use multisemiotic texts through the use of digital technologies. (BRAZIL, 2018). Students could watch the video as many times as they wanted, with or without subtitles, and could respond to the questionnaire at any time they deemed appropriate, within the time window of one week. The form was designed with 20 evaluation items, with assertions to be marked as true or false, according to the content of the video. Although the evaluation items of the true or false type allow a chance for a 50% hit rate, the solution found to decrease the random hit rate was to increase the number of questions and structure non-obvious assertions, another aspect that increased the complexity. One of the items was the writing of the items in English and the audio of the video in English, which challenges the student to learn, to try to understand what he heard to judge an item as true or false.

Figure 1: Command of the evaluative activity

Cópia de Week 06 - Activity 06 - Listening Practice

Todas as alterações foram salvas no Google Drive


Perguntas Respostas Configurações Total de pontos: 20

Seção 1 de 2

Week 06 - Activity 06 - Listening Practice

You are going to watch and listen to a video in English, answer the questions according to what you have comprehended.
 The video is available online in the following link:
<https://www.youtube.com/watch?v=ibjUpk9Iagk>
 You can watch to the video as many times you want. Try to watch it without the captions, and try to make a linking between the narrator's speech and what you get to listen to.
 Don't be worried if you don't understand what you are hearing at first time. Repeat the video and listen to it again.
 You are allowed to turn on the captions if you have a basic level of English.
 You can try this questionnaire only once.

Watch and listen to the following video. After that, select TRUE or FALSE, according to the information you listened to.



Source: prepared by the authors.


Figure 2: The History Video of Chocolate incorporated into the assessment instrument form

Cópia de Week 06 - Activity 06 - Listening Practice

Todas as alterações foram salvas no Google Drive

Perguntas Respostas Configurações Total de pontos: 20

Watch and listen to the following video. After that, select TRUE or FALSE, according to the information you listened to.

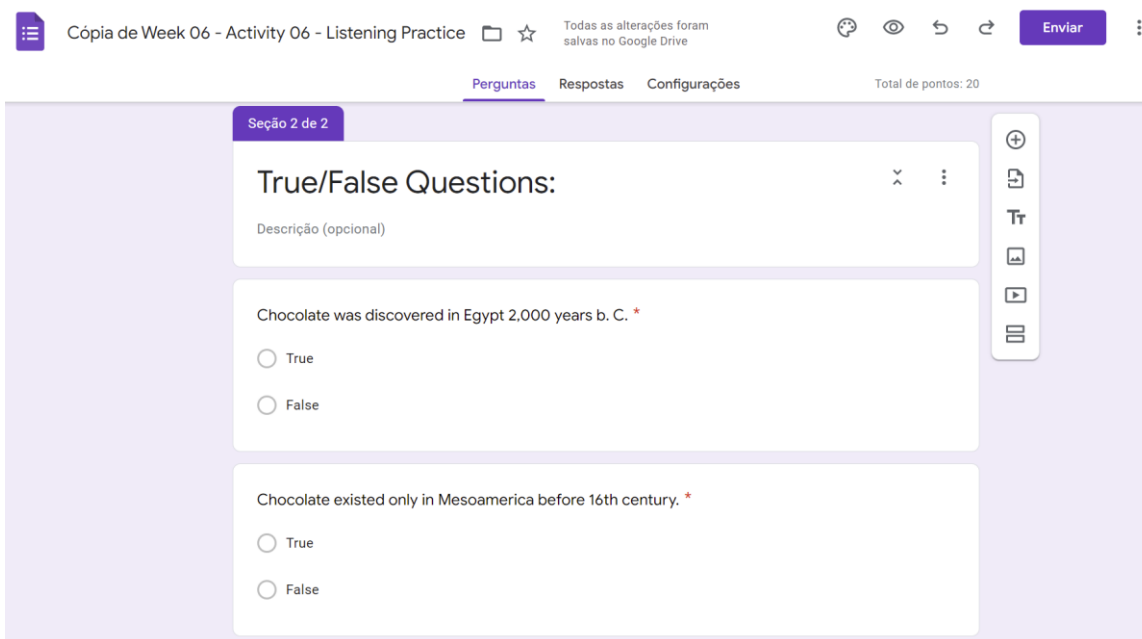


Full name: *

Texto de resposta curta

Source: prepared by the authors.

Figure 3: True or false evaluation items



Source: prepared by the authors

After the deadline for accepting the students' answers, the data were extracted through a spreadsheet of results in Google Sheets . After extracting the worksheet, the data were de-identified by labeling the students with codes, following this pattern STU01 (student 01), STU18 (student 18), etc. With the de-identified data, two researchers counted the number of hits and calculated the hit rate of each student, this rate demonstrates the percentage of hits in the listening comprehension activity that was evaluated. From these data, the following table was created:

Table 1: Percentage of individual hits

Disidentified research participants	Total number of correct answers / Number of questions	Percentage of hits
STU-01	17 / 20	85%
STU-02	19 / 20	95%
STU-03	11 / 20	55%
STU-04	18 / 20	90%
STU-05	18 / 20	90%
STU-06	16 / 20	80%
STU-07	15 / 20	75%
STU-08	12 / 20	60%
STU-09	18 / 20	90%
STU-10	17 / 20	85%
STU-11	18 / 20	90%
STU-12	10 / 20	50%
STU-13	19 / 20	95%
STU-14	18 / 20	90%
STU-15	19 / 20	95%
STU-16	18 / 20	90%
STU-17	14 / 20	70%
STU-18	18 / 20	90%
STU-19	16 / 20	80%
STU-20	17 / 20	85%

STU-21	16 / 20	80%
STU-22	18 / 20	90%
STU-23	18 / 20	90%
STU-24	19 / 20	95%
STU-25	15 / 20	75%
STU-26	19 / 20	95%
STU-27	12 / 20	60%
STU-28	17 / 20	85%
STU-29	19 / 20	95%
STU-30	16 / 20	80%
STU-31	20 / 20	100%
STU-32	19 / 20	95%
STU-33	20 / 20	100%
STU-34	17 / 20	85%
STU-35	18 / 20	90%
STU-36	9 / 20	45%
STU-37	15 / 20	75%
STU-38	14 / 20	70%

Source: prepared by the authors

From this table, with the individual result of each student, the students were grouped according to the percentage of correct answers in descending order, which generated the following table:

Table 2: Distribution of students by percentage of correct answers

Percentage of hits	Number of participants
100%	two
95%	7
90%	10
85%	5
80%	4
75%	3
70%	two
65%	0
60%	two
55%	1
50%	1
45%	1
Total	38

Source: prepared by the authors

As can be seen in the table, 35 students or 92.1% of the students had a performance above 60% (which means an accuracy of 12 questions or more), only 3 students or 7.9% had a score below 60%. Nineteen students, that is, 50% of the participants, had a performance higher than 90% (that is, they got between 18 and 20 questions right), which indicates that these participants hardly got the questions right at random. A possible explanation for a high rate of hits may be the lack of pressure to achieve a grade. The pressure of achieving a grade ends up negatively influencing the results of an assessment, and this fits the “exam pedagogy” criticized by Luckesi (1999). When there is no pressure to achieve a grade, students perform the assessment activity without the pressure of external pressure, and their performance tends to be better. As the activity was aimed at learning English and the students played an active role in managing

the activity, being able to watch the video several times, with or without subtitles, and could answer the questionnaire when they felt comfortable, possibly this freedom of action in the learning process contributed to a high rate of correct answers within and above the 60% average.

Other data that reinforce the low probability of a random hit are the hit rates per question, which can be seen in this table:

Table 3: Index of hits per question

Questions	Percentage of hits	error percentage
Question 01	84.21%	15.79%
Question 02	84.21%	15.79%
Question 03	76.31%	23.79%
Question 04	94.74%	5.26%
Question 05	94.74%	5.56%
Question 06	86.85%	13.15%
Question 07	73.68%	26.32%
Question 08	94.73%	5.27%
Question 09	92.10%	7.90%
question 10	92.10%	7.90%
question 11	50%	50%
question 12	81.57%	18.43%
question 13	84.21%	15.79%
question 15	57.89%	42.11%
question 16	94.73%	5.27%
question 17	89.47%	10.53%
question 18	65.78%	34.22%
question 19	84.21%	15.79%
question 20	94.73%	5.27%

Source: prepared by the authors

As can be seen, only questions 11 and 15 were in the range of 50% correct, indicating that these questions raised doubts in the research participants. All other questions had high accuracy rates, indicating that the research participants had a greater degree of certainty regarding the correct answer.

Obviously, this study represents the reality of only 38 high school students and their performance cannot be generalized, considering the limitations of this study. Perhaps if the same experience is replicated in another context, the results may be different. We emphasize that, as there was no charge for grades or rewards regarding the performance of students throughout the educational process of application of the “Chocolate” Didactic Sequence, it may be that this factor also influenced a better performance compared to a final summative evaluation. of bimester.

As all activities were designed to be carried out in the context of remote teaching, there was no strict control of other variants that may influence the test results, such as research on other sites to solve the questions and, even considering this hypothesis, it is necessary to consider that students had to research English language questions on the internet, expanding the student's exposure to the English language and fostering skills other than linguistic ones, such as the ability to research. That is, online activities can awaken in students a more active role in solving problems posed by learning activities.

5 FINAL CONSIDERATIONS

Resuming the observations of Fernandes, Isidoro and Moreira (2020), emergency remote teaching created a challenging context both with limitations, such as infrastructure issues and access to digital technologies, but also brought space for innovation, such as carrying out online activities using features such as online video conferencing and online forms.

This study sought to first investigate the means of evaluating learning during remote teaching, in order to try to answer this question, the principles of learning evaluation were researched, and everything indicates that continuous, procedural evaluation, during all stages of development of a project focused on didactic sequences (which can be understood as learning modules), seems to be more successful than simply applying a summative assessment at the end of a learning period, a procedural assessment that is defended by Luckesi (1999) and Valadares and Graça (1998). Student performance during the learning process seems to be more important than measuring a grade, so it is preferable to measure student performance using percentages of correct answers, such as the percentages indicated in the data discussed in the previous section. In the case of students with low percentages of correct answers, the teacher must act through specific pedagogical interventions, such as reinforcement activities, and these strategies can only be worked in the classroom if the teacher has carried out the evaluation process.

Regarding the second research question, about the advantages and disadvantages of assessment instruments used during emergency remote teaching, it can be said that Google forms can be used as digital assessment instruments. In these forms it is possible to add text, image and video, allowing the use of multisemiotic textual genres, which is recommended by the BNCC (BRASIL, 2018). Google forms require dedication from the teacher for their construction, but after being prepared and saved in Google Drive, they can be reused, edited, modified. Another advantage of using Google forms is that student participation is recorded, the number of correct answers and errors is also recorded, and a spreadsheet can be generated with this information, even facilitating the analysis of student performance in a activity, indicating to the teacher possible changes in teaching strategies. Another advantage of an online assessment instrument is the autonomy and self-management experienced by students in this type of activity, the student plays an active role, being able to carry out online research to find solutions to problems. In this way, it can be said that digital assessment instruments have the potential to expand students' learning opportunities.

As for the limitations of digital assessment instruments, the low level of control of the teacher in this assessment process must be considered, as the student can carry out the activity at his own home, in the *lan house*, in the school's computer lab, on public transport, in the public library, anywhere. Another weakness of digital assessment instruments would be the consultation of others to solve the problem, which forces the student to interact with other people to help him in solving the problem, this can both be seen on the positive side, as the learner is learning with the most capable pair (VYGOTSKY, 1991; 1998); and on

the negative side, which would be the act of “gluing”. In any case, this possibility must be considered in the application of online activities.

Another limitation of this research was the participation of few students, only 38 participated, so the results of this research cannot be generalized. And although the data analyzed are of a quantitative nature, it is necessary to consider the performance of students throughout the development of a structured project as a didactic sequence must be analyzed qualitatively. As 92.1% of the students got more than 60% of the questions right, and 50% of the students had a performance above 90%, this indicates that they somehow managed to understand the video in English to answer the questions.

Finally, after applying the English language assessment activities, proposed for high school students, sewing a didactic sequence to a pedagogy of projects, it can be said that this combination successfully culminated during the emergency remote teaching period. It may be that the elaboration of a project linked to a didactic sequence gives work to the teacher, as it is a differentiated teaching methodology and in which the teacher participates as a mediator of the teaching and learning process, however, the pandemic context allowed putting into practice this way of teaching in which the student needs to act more autonomously and independently. In fact, the online teaching platforms that were used during the pandemic served as a great laboratory, in which there were successful experiences and experiences that indicated the need for reformulation, either in the way of teaching or in the way of evaluating.

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CHAPTER 85

General considerations about syncope: a clinical approach General

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ABSTRACT

The following study aimed to describe the etiologies and the respective clinical picture of syncope. Syncope is classified as a symptom of loss of consciousness due to reduced cerebral blood flow, secondary to an etiology. Such an event is often confused with other conditions associated with loss of knowledge, although to diagnose syncope it is necessary to rule out other alterations. Syncope is a condition whose pathophysiology is the Vasoconstriction of blood in the brain, but it has several causes such as neuromediated, orthostatic, cardiac, cerebrovascular, and even idiopathic, resulting in different clinical conditions and complications, but the same outcome. Such an event needs to be investigated and detected immediately, by clinical history, physical examination, and complementary.

Keywords: syncope, symptom, hypoperfusion.

1 INTRODUCTION

THE syncope anything most It is what a symptom characterized fur deficit brusque, temporary and total consciousness, related to dysfunction in the maintenance of tone postural and fast restoration in form

Random. This one event It is considered one recurrent emergency in health posts. The condition can often be confused with other findings and be mishandled or even remain undiagnosed (GNAN, 2019).

From an epidemiological perspective, syncope has a bimodal incidence, that is, it has a peak in late adolescence to early adulthood, with a focus on vasovagal presentation, followed by another peak in the third age, with a raise high post you 70 years old. emphasizing, what if treats in a problem common, with predominance around in 20% gives population in general (MORAG, 2021).

The following study aimed to describe the etiologies and the respective clinical gives syncope.

2 METHODOLOGY

it is in a study qualitative gives revision narrative in literature, made to discuss the particularities attributed to syncope. It consists of a extensive literature review, together with a flexible and replicable methodology at the level of reproduction in Dice and answers quantitative for questions specific. This one he was based on the platforms of SciELO, Pubmed, LILACS, Virtual Library in Health, PubMed, Google Scholar and other relevant scientific literature with the theme in the period of June 2022, using the following descriptors: Syncope, Cerebral hypofusion and Clinical Picture, in a combined or isolated form without delimiting a break temporal.

In total, 50 articles were found in Portuguese and English. The criteria in inclusion were you most current, to possess at expressions used in the searches at the title or keywords, or have it explicit in the abstract that the text relates to the association of the mechanisms related to the framework syncope, the data based on evidence and what had a clear and direct language. The discarded articles did not have the criterion in inclusion established, and/or presented duplicity, in addition at dissertations and theses and others studies without relevance to objective proposed. After have been restored target information, the reading of titles and abstracts was initially conducted, with intense exclusion in publications in this stage. Posteriorly, he was effective the reading complete of the 25 texts. As an axis of analysis, we initially sought to classify the studies how much at particularities gives sampling, grouping those ones whose samples are about you agents causal and O painting clinical of stricken. THE leave so, continued with The analysis gives reasoning theoretical From studies, well as The Note of features general From articles, such as O year in Publication and language, followed in their goals. Finally, there was an appreciation of the applied methodology, results obtained and discussion. Specifically, for to analyze The production scientific identified, if used specific quantitative and/or qualitative data processing techniques, by having been made to analysis in each one of the texts.

3 RESULTS AND DISCUSSION

The search of the articles that supported this article detected 250 references to respect of main considerations clinics about The syncope in the bases in Dice mentioned, of which 25 publications were included in the present review. Between the selected studies, 20 are theoretical, 4 are case studies and 1

presents a study cross. There was a prevalence of publications in English, representing 84%, followed by the language Portuguese 9.6% and Spanish.

THE syncope It is one condition only and has as pathophysiology The reduction of flow in blood at the space brain. This one restricted flow he can to be regional, through gives vasoconstriction or systemic due to hypotension. Due to the numerous etiologies, but for if the state of syncope is confirmed, there must be no causes of loss of consciousness such as a pseudosyncope, convulsive states and traumatic brain injury. Furthermore, for syncope occurs, an extension of at least 10 seconds of cessation is essential total blood flow or nutrient delivery, either to the cerebral cortex how much for O system in activation reticulate of trunk encephalic, or one reduction perfusional around 35% The 50% (CELESTINO, 2018).

Syncope is generally not a cause for alarm and is benign and may have several triggers what correspond The range age. O risk high in syncope in patients seniors, if he must mainly by abnormalities related The age and at illnesses what affect the ability to react to basal stress that under normal conditions do not would result at syncope. Furthermore, it is correlated The one exponential rate in recurrence, and it evolves according to the age group. Therefore, the most potential risk factor is already a previous episode occurred (NUNES, 2018).

Reflex, neuromediated or neurocardiogenic stimuli are the most seen across all age groups, causing vasovagal syncope, characterized by autonomic dysfunction, ephemeral and abrupt loss of consciousness, with full recovery, spontaneous and does not indicate any underlying disease, resulting from fear, anxiety or odors unwanted. Furthermore, as variance gives syncope vasovagal has O type situational which occurs by exacerbation of the reaction to vasovagal stimuli such as coughing, sneezing, urination, defecation, swallowing and eye pressure, leading to loss of consciousness (BRIGNOLE, 2020).

finds in hypersensitivity of breast carotid, occurs most in seniors, usually caused fur use in necklaces or ties tight, mobilization abrupt with the neck and the simple mobility of the neck results in loss of consciousness. That mechanism is rare and leads to bradycardia and reduced blood pressure resulting from exaggerated reaction From receivers located at the pair in carotid of neck what causes O electrical reflex brake cardiac action (NUNES, 2020).

The so-called case of orthostatic or postural hypotension is the abrupt decline of blood pressure in the orthostatic position, more common in the elderly, post- prandial, in situations in hypovolemia, sympathectomy, acts iatrogenic as The improper administration of drugs, involvement by nervous system dysfunction autonomous, correlation to some pathology such as diabetic neuropathy or idiopathic. Situation resulting from reduced venous return and non-compensation for reflection sympathetic autonomous (ROCHA, 2019).

Factors of cardiac origin represent 1% of cases in young patients, are closely associated with architectural failures of the heart such as aortic stenosis, valvular heart disease, atrial myxoma and acute myocardial infarction. Noting that despite being the rarest source of syncope, is consistent with the doubled

potential for mortality. Furthermore, the occurrence of arrhythmias, pulmonary embolism and heart failure congestive predisposes to development of this (CELESTINO, 2018).

The triggering of syncope certainly occurs with the association of several factors, such as medications that culminate in the reduction of blood pressure, due to the mechanism in vasodilation or hypovolemia, in Special The class in diuretics, O stylism, volume depletion, exemplified by the occurrence of hemorrhage, inadequate fluid, diarrhea, emesis, pulmonary pathologies that lead to a shortage of oxygen cerebral and factors environmental as stress thermal (OAK, 2022).

Syncope episodes usually occur in the absence of symptoms of splurge, during physical exertion and in the supine position. Noting that cases of syncope from physical activity, it is essential to carry out the differential diagnosis of a classic triad, The which approach The tachycardia From ventricles, common The ischemia heart, The cardiomyopathy hypertrophic obstructive, The which compose potential cause in death fulminant in youth athletes and aortic retraction prevalent in the geriatric group (ROCK, 2021).

At pathologies cerebrovascular no are The cause base gives occurrence in syncope. At the however, The ischemia vertebrobasilar It is one potential etiology, per to be in charge for the watering the trunk brain, fur narrowing of carotid bilateral per consequent low overall flow and blood extravasation in the subarachnoid region (VELTEN, 2019). THE syncope no constitutes one emergency clinic, but O deficit in detection It is prevalent, required The Association gives story clinic, exam physicist and electrocardiogram. THE syncope usually to be in resolution own and fast, highlighting what The syncope cardiology generally entails prognosis with most complications. At the Emergency Room, to if admit a patient suspect in syncope, The conduct initial It is delete The cause heart. This one process he can to be done per quite gives analysis comparative gives syncope in origin heart or not. THE syncope heart affect with larger predominance O sex masculine, range age higher The 60 years old, heart diseases preexisting, historic familiar, tests cardiovascular changed and syncope during activities physical and at position supine. THE syncope in origin no heart attacks most you young people, without manifestation in pathologies heart, occurs most at position in orthostasis, triggers and recurrent (OAK, 2022).

To complement the clinical data obtained, regardless of the cause of syncope, an echocardiogram is requested, in addition to some indications such as recurrence, single episodes of physical injury, and diagnostic exclusion indicate O test gives slope, found in bases meteorological The effectiveness in tomography computerized, electroneuromyography and evaluation in dysautonomia and against in exams normal and absence of alterations can be considered the idiopathic cause event (OLIVEIRA, 2018).

3 CONCLUSION

In view of the collection of information, it can be concluded that syncope is a condition simple, common and what no It is considered one emergency clinic. At the comes, is fundamental a detailed


anamnesis, a thorough physical examination and the complementation with exams for if unravel The cause,
O painting clinical, O diagnosis differential and the handling adequate.

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CHAPTER 86

Perspective on Biotechnology Transfer in Brazil in IST: a case of a “Spin-off” in the Brazilian Amazon Region

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ABSTRACT

The origins of modern biotechnology date back to the sixties and early seventies in academic laboratories in the US and Europe. In these laboratories, the development of new biotechnological products emerged as a result of technological and scientific advances that used innovation and technology transfer in everyday research. In this context, it is clear that universities and research institutes have played a crucial role in the development of technological innovations, especially in the large area of biotechnology. Potential solutions to some of the global challenges faced by society are provided largely as a result of academic and laboratory research, whether by universities, " Spin-offs ", research institutes and technology-based " Startups ". This article aims to outline an overview of Science and Technology Institutions-ICTs and demonstrate the transfer of technology, through spin-off , in the area of biotechnology in the Amazon, aligned with the perspective of innovation in technologies and green patents. It analyzes the Science and Technology Legal Framework, which allows the use of resources to make innovative activities more flexible and the introduction of a new culture and advances in innovation in the Institution. It mentions the importance of the Amazon biome for the environmental health of the planet and the use of Intellectual Property, in the protection of the innovation of products and services generated in the research. Finally, it reports the case of a biotechnology spin-off in the adoption of practices favorable to sustainable technology and the search, learning and implementation of this technology for the market.

Keywords: Technology Transfer; Spin-off ; Green Technology; ICTs; Innovation.

1 INTRODUCTION

Biotechnology is referred to as one of the enabling and key technologies of the 21st century, having the potential to offer, for example, solutions to health and resource-based problems facing the world, such as unmet medical needs and dependence on fossil fuels. Therefore, it is easy to understand that the relevance of biotechnology is even more unique if we consider that the modern biotechnology industry is only a quarter of a century old.

Another sensitive point in this discussion addresses the concept that the strategic practice of innovation is essential for research and for biotechnology-based companies. Such biotechnological innovations often have a higher level of innovation compared to other industries. Due to this relatively high level of innovation, there is greater uncertainty about whether these innovations will make it to the markets. A major difference lies in the fact that academic research is a crucial source of innovation for the biotechnology industry. Universities and research institutes have played a crucial role in the development of technological innovations. Innovation and technology transfer are effective for the development of biotechnology, as they provide potential solutions to some of the current challenges faced by global society.

The fantastic biodiversity of the Amazon arouses the interest of the entire world scientific community, in this way the Amazonian flora and fauna can create productive processes or even develop revolutionary substances for different applications. These processes must be aligned with the sustainability of the planet, so marked by the constant disrespect for the environment and biodiversity, already visible in climate change and consequent accidents in nature. In this sense, a more eloquent attitude of public policies becomes necessary, enforcing the existing laws, which defend biodiversity interests for the survival, with quality, of future generations, as well as the awareness of the importance of knowledge, coming from Universities and Federal Institutes, to conduct research with the development of new sustainable processes and products, which provide the technological transfer of a solution for society. The Institution of Science and Technology - ICTs, which include Universities and Federal Institutes of Education, Science and Technology - IFs, are no longer just generators of knowledge and basic research, but instead contribute with solutions for society, through of *spin-offs*, which we can conceptualize as nascent companies, based on technological research, which will be able to exploit this technology, generate intellectual property for the Institution and transfer the technology to society. And this was regulated by Law 13.242/2016, called Legal Framework for Innovation and Industrial Property Law Law No. 9.279, of 05.14.1996, which regulates rights and obligations related to industrial property.

Pinsky and Kruglianskas (2017) report that the concept of sustainability-oriented innovation is comprehensive and receives several denominations in the literature, such as sustainable, green, eco or environmental innovation. The research of the aforementioned authors considers the concept of eco-innovation, which was developed based on the Organization for Economic Cooperation and Development (OECD) definition of innovation.

In this sense, the *spin-offs* that work in the biotechnology area, mainly in the Amazon, can contribute with a research project, within the Universities or Federal Institutes, for the development of products with green technology and consequent protection of the product, through of green patents. For Santos *et al* (2017), green patents are patents focused on green technologies, that is, patents that relate to technologies that mitigate climate change, those that include reducing carbon emission and pollution, increasing energy efficiency and of resources and reducing the loss of biodiversity and ecosystems .

According to Richter (2014), green patents are important for the dissemination and use of new technology, as well as its effects on sustainability. The author states that the pilot program "Green Patents" was created in 2012 through Resolution PR 283/2012 of the National Institute of Industrial Property - INPI, in line with public policies related to combating climate change in the form of Law 12187/ 2009, which established the National Policy on Climate Change - PNMC. She also states that the advantage in the agility of granting green patents is the fact that their holders make the new technology available on the market also in less time than usual, considering the environmental appeal and the pressing need for new technologies.

Thus, it is important to consider which parameters contribute to the success of Science and Technology Institutions-ICTs that can generate *spin-offs* with green technology, to generate environmental sustainability, as well as the perspectives of protection and technology transfer arising from the development of biotechnological activities in the Amazon, thus constituting a valuable opportunity to understand this universe and its challenges.

2 PURPOSE

Demonstrate that Science and Technology Institutions-ICTs can generate *spin-offs* with green technology and the perspectives of protection and transfer of this technology, arising from the development of biotechnological activities in the Amazon.

3 METHODOLOGY

This article is structured under the exploratory and bibliographic method, developed based on a literature review, using secondary data. It contextualizes Amazonian biodiversity, presents the panorama of Science and Technology Institutions-ICTs, the Legal Framework for Innovation and the case of an academic spin-off in the area of biotechnology, generated in an ICT, and its motivation for the discovery of a product with green technology and the transfer of this technology to society.

4 THEORETICAL REVIEW

4.1 AMAZON BIODIVERSITY

The Amazon comprises one of the largest and most diverse biomes on the planet (Figure 1) containing a rich biodiversity of fauna and flora with a high degree of endemism. In an area of almost four thousand km², it integrates eight Brazilian states and 125 federal conservation units (ICMBIO, 2021).

Figure 1-Amazon Biodiversity



Source: image taken from the page of AMBIPAR GROUP/BRASIL COLETA on 03.08.2022

According to Franco (2013), in the scientific literature, the interchangeable terms biological diversity and biodiversity emerged to address issues related to the fundamental themes of ecology and evolutionary biology, related to the diversity of species and the environments that serve as their basis. support, at the same time that they are supported by it and that are, at the same time, the stage and the result – always unfinished – of the evolutionary process .

The biodiversity of the Amazon, according to the MCTI (2021), is gigantic and this exceptional variety of life plays a fundamental role in the functioning of ecosystems and, ultimately, for human well-being. Its importance is recognized worldwide, occupying a prominent place in the international scenario. Unfortunately, threats to this rich biodiversity are growing. However, highlights MCTI, deforestation and forest fires have increased in recent years. Illegal logging always predominates over legal management. Hydroelectric plants and mining promote drastic socio-environmental changes. To top it off, climate change trumps all these problems. One of the main ones, emphasizes the MCTI, is the disruption of a web of biological processes and interactions essential for environmental and human health. For example, the reduction in the diversity of slow-growing trees leads to a lower capacity to absorb carbon from the atmosphere, contributing to worsening global climate change. The loss of biodiversity also compromises the potential for its sustainable use and prosperity for local and other populations around the world through the use of bioproducts in industries (MCTI, 2021).

However, when debating the role of ICT under the dynamics of globalization, it is imperative to make a critical assessment of current advances and challenges, but also of the ingrained dilemmas that lead to possible setbacks in research and the emergence of *spin-offs* , in order to propose sustainable solutions. Therefore, it is necessary to recognize that there is an immense demand to guide development with inclusion and reduction of social inequalities, expanding actions in the field of sustainability and socio-environmental responsibility.

4.2 SCIENCE AND TECHNOLOGY INSTITUTION-ICT AND THE LEGAL FRAMEWORK FOR INNOVATION

In contemporary debates, Chaves and Araújo (2020) point to the strategic relevance and commitment of Science, Technology and Innovation - ST&I to the establishment of innovation *habitats* as important bases for the development of society with sustainability. Still in the authors' view, the performance of Science and Technology Institutions-ICTs is perceived as strategic for advancing the process of society's development. However, this statement mixes a complexity of challenges and dilemmas for the generation of *spin-offs*.

13,243 /2016, regulated by Decree 9,283/2018 and called Legal Framework for Innovation (amends Law 10,973/2014), in its Art . with a view to technological training, the achievement of technological autonomy and the development of the country's national and regional production system, pursuant to arts. 23, 24, 167, 200, 213, 218, 219 and 219-A of the Federal Constitution .

Defines the Scientific, Technological and Innovation Institution (ICT) as a body or entity of the direct or indirect public administration or a non-profit legal entity governed by private law legally constituted under Brazilian law, with headquarters and jurisdiction in the country, which includes in its mission institutional or in its social or statutory objective basic or applied research of a scientific or technological nature or the development of new products, services or processes.

Among the permissions granted by the Legal Framework for Innovation, there are:

- Promotion of cooperation and interaction between public entities, between the public and private sectors and between companies;
- Stimulation of innovation activity in Scientific, Technological and Innovation Institutions (ICTs) and in companies, including for the attraction, constitution and installation of research, development and innovation centers and technology parks and poles in the country;
- Encouraging the creation of favorable environments for innovation and technology transfer activities;
- Promotion and continuity of scientific and technological training and qualification processes;

In this universe, points out SEBRAE (2022), the approved law seeks to encourage the development of the sector through three main axes: it allows the integration of private companies into the public research system; the simplification of administrative, personnel and financial processes in public research institutions and the decentralization of the promotion of the development of ST&I sectors in the States and Municipalities. stands out to be It is important to note that the changes brought by Law No. 13,243/2016 have the potential to integrate research, the market and the public sector, and also to transform the scientific knowledge produced in the country into innovative products and services for society.

Corroborating the previous statements, Goulart (2022), in a recent lecture at INPA, explained that the Brazilian Legal Framework allows for a series of flexible measures for innovation and *spin-off development* , but the internalization of these measures in the university is complex, given that the autonomy they have and the non-use of the solutions mentioned. He explains that in other countries universities are

partners in *spin-offs*, receiving royalties, but these opportunities, allowed by the Legal Framework, are not absorbed by universities. It explains that the R&D must be validated by regulatory agencies and form strategic partnerships to achieve scalability or license the technology to be commercialized and obtain product certification.

Therefore, in this sense, ICTs still have the possibility of implementing business incubators (to support *spin-off* and *startup management*) and Technological Innovation Centers (NIT), to support the Innovation and Intellectual Property policy. at the Institution, among other areas, biotechnology, with a focus on environmental sustainability.

4.3 ABOUT ECO-INNOVATION / GREEN TECHNOLOGY / GREEN PATENT

Green technology starts from a concept that seeks to determine a **sustainable production process**, applying good techniques in order to cause less possible impact on the environment. Eco - **innovation**, **according to** Schneider (2020), it is part of a sustainable and innovation-based development process. The author mentions that eco-innovation is closely linked to a variety of related concepts, such as eco-efficiency, ecological design and sustainable design. Therefore, it is possible to verify the existence of gaps between each of these concepts, as well as, such gaps could and should be filled to unify them in a single movement strong enough to create a new trend/ecological order, both in the technological dimension and in the in the social dimension, whose priority is sustainable development. On the other hand, Schneider (2020) states that eco-innovation represents a fundamental opportunity to overcome global sustainability challenges and a business opportunity that can make the Brazilian economy even stronger and more competitive in the future, as it is a new business approach that promotes sustainability over a long period of time. the entire life cycle of a product, in addition to increasing the company's performance and competitiveness. A new management approach to sustainability.

In this trend, the “Green Patents” program, promoted in Brazil by the National Institute of Industrial Property (INPI-BR), has as main objective to gather and accelerate the examination of patent applications that contemplate innovations related to the environment and at the same time identify new technologies for sustainable development, on the other hand, makes it possible to obtain a letter patent with a reduction of up to 90% of the normal examination period (RICHTER, 2014). This measure encourages researchers to seek protection for their innovative technologies.

For Santos and Martinez (2021), although the process of development, diffusion and implementation of green technologies is complex and multidisciplinary, one thing is clear: a fundamental first step in the process of green innovation is taken when the available green technologies are known, followed by the identification of the main actors in this large “cluster”. Thus, the authors clarify that with the provision of such knowledge about Industrial Property, scientists, engineers, policy makers and industry stakeholders can plan more effectively research and development activities for environmentally sound

technologies (EST's), forging strategic partnerships and delivering more effective technology transfers as needed.

According to Santos and Martinez (2021), much information currently available in the world about new green technologies can only be found by reading patent documents. They also state that since the 1970s, many scientists and researchers, entrepreneurs and industrialists, have discussed side by side with heads of state in a major world conference organized by the United Nations (UN) to address issues related to environmental degradation, as well as how to point out real alternatives on how to improve man's relations with the Environment. For Fanhaimpork et al (2022), describing and defining these green technologies constitutes a challenge for anyone seeking to file a patent application.

Currently, the Sustainable Development Goals (SDGs) propose the 2030 Agenda for global development for the next 9 years, but there is still much to discuss about the real actions that are being carried out to improve the life of the planet and allow a healthy world for the next generations. According to the SDGs, the 17 Goals based on 169 goals are the steps identified to guarantee a fairer, more dignified, more inclusive and sustainable world where it proposes the eradication of poverty and hunger to gender equality and quality health, from clean water and sanitation to decent work and economic growth, from reducing inequalities to quality education, from renewable energy to climate action. This agenda reflects the balance between the following 05 (five) principles: (i) people; (ii) planet; (iii) peace; (iv) partnerships; and, (v) prosperity that are presented as pillars of this global strategy.

4.4 BIOTECHNOLOGY *SPIN-OFF*

Biotechnology can be understood as the application of science and technology to living organisms, as well as their parts, products and models, to alter living or non-living materials with a focus on generating knowledge, goods and services. And in this context, Bioeconomy focuses on putting into practice biotechnological applications in the set of economic activities of production, promotion of production, distribution and consumption of goods and services from socio-biodiversity resources (SECTI-SEDECTI, 2022) .

According to CNI (2013), Bioeconomy emerges as a result of a revolution of applied innovations in the field of biological sciences. It is directly linked to the invention, development and use of biological products and processes in the areas of human health, agricultural and livestock productivity, as well as biotechnology.

- *offs* are companies generated from a research project developed within universities or Federal Institutes. According to Amaral (2021), they have information difficulties in the area of business management, from the development of marketing plans, strategic partnerships, sales and financial management, since most managers of this type of company come from academia. and do not have training or experience in business management.

Biotechnology is a relatively new area and the entrepreneur, in general, is a researcher, who concentrates the main source of information within the institution as a university project and the information he has is strongly located in knowledge and technology involved in the development of the product, scientific research results. However, for Amaral (2021) The biggest challenge for biotechnology companies is to transform their business into a business model that is efficient and is an interface between the technology developed and the creation of economic value. Taking this statement into account, one observes the difficulty of a *spin-off* in transferring its technology to society and many open their own businesses, when possible.

Therefore, *spin-offs* that work in the area of biotechnology, especially those that operate in the Amazon, have an enormous possibility of generating innovation with a focus on sustainable technology for the transfer of this technology to society and the subsistence of future generations with quality of life. It is important to recognize the central role of academies, notes Chaves and Araújo (2020) as producers and depositories of knowledge and trainer of technical skills, and this training points out Lasmar (2005), refers to the accumulation of knowledge and skills by individuals and organizations, from learning processes. In this aspect, the importance of the knowledge generated by the ICT for the creation of *spin-offs* is fundamental. The more knowledge is involved in the design of products and services, the greater their value in the market and the consequent added value of innovation in the company.

However, in the trajectory of the entrepreneurial vocation, Kupor (2019) observes that the most important thing for an entrepreneur, even with hard work and daily difficulties, is to maintain the hope of achieving success.

It was reported by Professor Ernesto Goulart, researcher at the Center for the Study of Human Genome and Stem Cells at USP, São Paulo-SP, at the “4th International Conference on Innovative Processes in the Amazon” “Academic Spin-off” (Palestra), at the Institute of Pesquisas da Amazônia-INPA, in Manaus-AM, June 14, 2022, that the research journey in search of something promising, innovative, until it becomes a marketable product is a challenge in Universities, as there are also problems and peculiarities of the innovation process in Brazil, since it has large amounts of patents deposited, but in the 57th position in the world innovation rank. It mentions that the patent application is not an indicator of innovation, as this indicator is measured by Technology Transfer-TT, which in Brazil are limited. He explains that this situation occurs because the innovation process in Science and Technology Institutions-ICTs is closed, inside the institution and with the imposition of limits and restrictions on its internal intellectual capital. It explains that *spin-off* has to think about intellectual property-IP every day, with everything mapped, to avoid failure, being extremely important to delve into this theme.

For Carayannis et al. (2012), the development of an innovation must take into account the pluralism of sources of knowledge, such as traditional knowledge that comes from the practices and *modus vivendi* of traditional populations composed of quilombolas, riverine people, various indigenous ethnicities, among

others. , whose main characteristics are orality and ancestry that provide important information for research and production of scientific knowledge.

In this context, the production of specialized knowledge, the production of social technologies, the increment of innovative inputs, products and services represents a field and a domain that has only just begun its pioneering in the region (CHAVES, 2012).

Thus, from this perspective, new horizons, new contours, contents and forms emerge, gaining scope and expectations of generating *spin-off* in biotechnology, protecting this technology and transferring it to society. It remains clear that there is a need for effort to expand the implementation of innovation practices, arising from technological research in biotechnology, through *spin-off* and its access to the market.

5 AMAZÔNICA SPIN-OFF CASE : PORÃ PRODUCTS DA AMAZÔNIA

The study carried out by the Center for Orchestration of Innovations COI (2022), points out that the five main scientific areas that appeared for the total of 1070 publications found in the search, according to the classification by categories of the *Web of Science* , were: plant sciences; environmental Sciences; food science and technology; ecology and molecular biochemistry. The following *case* used some of the areas cited by the IOC. The study results from the experience report presented by an IFAM researcher and co-author of the work.

Porã Produtos da Amazônia is a *spin off* originated from the Federal Institute of Education, Science and Technology of Amazonas-IFAM, founded in 2017, with the objective of bringing to the market a technological innovation differential associated with the phytopharmaceuticals, cosmetics and functional foods segment. , based on the benefits arising from the inclusion in their products of essential oils found in plants from the biodiversity of the Amazon. These benefits consist of offering the market products without preservatives, without added sugar, without lactose, thus providing an improvement in the quality of life and that benefit the body, in addition, functional foods help to slow down the evolution of diseases such as diabetes. or cancer. In addition, they also help to mitigate health problems, such as intestinal constipation, contributing with their bioactive compounds, which have proven activity in various types of treatments, also improving physical conditioning.

5.1 HISTORY

The idea arose when an IFAM researcher discovered that the diagnosis of hypothyroidism and type 2 diabetes and the need for people with this type of disease not to have adequate and tasty food to minimize the effects of diets prescribed by nutritionists, always with a routine and proposal for food reeducation, in a lifestyle change. The products on the market were horrible and unpleasant for the consumption of those who are under this type of treatment.

From there, he started to make some simple recipes at home and take them to be tasted in the department of the Department of Chemistry, Food and Environment - DQA, of IFAM, aiming to find a solution that would benefit this public.

5.2 DISCOVERING THE BENEFITS OF BIODIVERSITY

The tasting of differentiated recipes was well accepted at the Institution and from that moment on, the idea arose of starting research in the Food Laboratory of the Specialization in Food Technology course, where he had the opportunity to learn and discover the universe of the world of plants and their essences or rather their essential oils.

In 2015, I was already aware that products for people being treated for chronic diseases, such as diabetes (they had an inflamed body and altered taste due to the pathology), so it was necessary that there were products on the market that had taste, appearance and , mainly, were absent from preservatives, which could contribute to acting on energy *deficits* suffered by these people, in addition to providing therapeutic food comfort.

The first research came from the specialization with *Ocimum gratissimum essential oil* in tambaqui meatballs, under the guidance of two researchers from IFAM.

In the meantime, he started courses on Bakery with the use of Non-Conventional Food Plants (PANC), as well as research on the reuse of malt bagasse and brewer's yeast, originated from the production of artisanal pineapple beer by two more IFAM researchers, contributing with the reuse of malt.

The research at IFAM ended up interacting in a way that the waste was always used, so much so that in 2015 the idea of research for the production of flour from fruits, seeds, tubers, originating from the Amazonian biodiversity, always with the environmental awareness of the production of closed cycle, that is, total reuse of food, taking all the usual care of food safety and sanitary control, collaborating with sustainability.

The first breads were prepared and tested, based on the nutritional balance of each fruit, seed or tuber of açaí, araçá-boi, peach palm, bacaba, cupuaçu (pulp and almond), purple yam, gizzard yam, Brazil nut, babassu nuts, manioc, pequi, piquiá, uixi, camu-camu, acerola, buriti, among others, which are Amazonian plants and fruits, with some of the results presented as shown in figures 1 to 4.

Fig.01 Naturally Fermented Bread With Malt Pomace and Yeast Pineapple Beer – Fermentation Phase



Source: Munhoz, 2017

Bread Fig.02 Naturally Fermented Bread With Malt Pomace and Yeast Pineapple Beer – Roasting Phase



Source: Munhoz, 2017

Fig.03 Naturally Fermented Bread With Malt Pomace and Yeast Pineapple Beer – Fermentation Phase



Source: Munhoz, 2017

Fig. 04 Naturally Fermented Bread With Malt Pomace and Yeast Pineapple Beer – Roasting Phase



Source: Munhoz, 2017

The development team was formed by highly specialized professionals, in several knowledge segments (Bioprocesses, Design, Logistics, Information Technology and Process Management), due to the scope of the enterprise involving a complex context of activities, such as: Extractivism, agronomy family, training of manpower and Chemistry, with a view to serving both the national and international market. This provides a value chain for the product of Amazonian biodiversity. The *spin-off*, derived from research carried out at the IFAM Food Technology Laboratory and using green technology, has 5 types of gluten-free flour mix for breads, cakes and cookies, all with functional taste action and pleasant and different appearance. . The company produces its own banana peel-based yeast, which in the absence of raw material from craft brewery waste (yeast and malt bagasse) meets current demand. Figures 05 and 06 show more products manufactured from green technology.

Fig. 05 Mixed Bread 01 Gluten-free Flour
(Amazonian fruits and seeds)
Natural Fermentation



*Yeast: from reused fruit peels

Fig.06 Chocolate Truffle Cake**
Gluten -free Flour Mix 02
(Amazonian fruits and seeds)



*Yeast: reused from Amazonian fruit peels

In particular, the *spin-off* presents innovation routes since its conception, since the raw materials have characteristics that allow the development of a huge range of products, with different applications, until then little or nothing presented to the consumer market. Finally, another important aspect deals with the business model, which is premised on preserving the forest, sustainable development and valuing the culture of traditional peoples.

5.3 THE TECHNOLOGY

The project aimed to identify biopharmacological substances from the extracts of plants: Alfavaca (*Ocimum basilicum*), Crajiru (*Arrabidaea chica*) and (Curcuma) *curcuma longa* L, as well as to produce an ethanolic extract, with a certain concentration and to test antibacterial activity using culture, for the growth of gram-positive and gram-negative bacteria. The dry extract was also produced, from the maceration and drying of leaves, rhizomes and branches, for drying in an oven and subsequent crushing. After the extraction and purification of essential oils, the purified substances are engineered through Spray Dryer and nano encapsulation processes, for use in bioproducts (Phytotherapics, cosmetics and functional foods).

In conclusion, the company is studying an outsourcing strategy, establishing partnerships with companies in the scientific, industrial and commercial segments to enable a greater number of product options, thus making it possible to expand its operations in the phytopharmaceuticals, functional foods and cosmetics market and providing the technology protection, through the Technological Innovation Nucleus-NIT.

6 FINAL CONSIDERATIONS

This study sought to demonstrate that Science and Technology Institutions-ICTs can generate *spin-offs* with green technology, transfer this technology from biotechnological activities. It is understood that the dialogue between academia and researchers can create possibilities to promote various actions that can contribute to sustainable development and combat threats to this rich biodiversity. The ICT has a whole legal framework to start a support process in the creation of *spin-offs*, protect the product and transfer the

technology, it is enough to internalize Law 13.243/2016, in order to socialize its knowledge and transform it into an innovative and sustainable solution for society, as well as the Industrial Property Law No. 9.279, of 05.14.1996, which regulates rights and obligations related to industrial property. The *case* of Porã Produtos da Amazônia, a *spin-off* generated in IFAM laboratories using green technology, is an example of how the knowledge provided by Universities and Federal Institutes can contribute to the future of the planet.

The benefit of accelerating the examination of patent applications, which contemplate innovations related to the environment, enabling agility in granting green patents at the INPI, should encourage the application for the filing of patents arising from green technologies and collaborate for innovations in the market. Thus, the feasibility of investing in *spin-offs* in the bio-business area, contributing to the health of the planet, makes it possible to see a future of opportunities that must be taken advantage of in the Amazon region. There is immense potential for the production, processing, commercialization and consumption of products from biodiversity, which generates expectations to develop solutions to stimulate the production chain and the development of the Amazon Region, which serves to strengthen the path of development with social inclusion from the perspective of sustainability and respect for the environment. Therefore, these opportunities can be used to strengthen applied research and technology transfer from ICT to society, generating innovations.

One can also prove the possibility of creating a *spin-off* in ICT, through the case of Porã Produtos da Amazônia, which from a public need met a great demand, using biodiversity to create innovative products with green technology, developing a value chain. It is worth mentioning that the *spin-off* was supported by the AYTU-Incubator of Companies of the IFAM, in several capacities, from understanding its Business Model (CANVAS) to the elaboration of its Business Plan.

Therefore, it is evident the importance that knowledge has in promoting entrepreneurship, in this way, it becomes necessary for Educational Institutions (ICTs) to use available resources to present solutions and generate biotechnology *spin-offs*. This means a new procedure and a new culture at all levels of the Institution. Furthermore, in Brazil, especially in the Amazon, which is rich in biodiversity, research seeds are already sprouting in the ICT scientific community, mainly in green technologies. There is a strong coexistence with traditional communities and the appeal of forest preservation is evident, as it directly affects the future of the next generations.

The *spin-off* can still count on the support of the NIT, for the due protection of its creation, at the National Institute of Industrial Property-INPI. You can also count on the support of a business incubator to support your journey to market. Therefore, the prospects for research in ICTs to transform themselves into innovative and sustainable products, through a biotechnology *spin-off*, among other areas, are in place, it is enough to be practiced, as the legal framework, through the Legal Framework for Innovation and demands are made.

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CHAPTER 87

Clinical-epidemiological profile of dengue cases in Picos-PI, from 2020 to 2021

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ABSTRACT

OBJECTIVE: To evaluate the epidemiological-clinical profile of patients affected by acute febrile illness in a city in northeastern Brazil. **METHODOLOGY:** Descriptive, cross-sectional retrospective study with patients infected by DENV in the city of Picos-PI. The collection was provided by an

employee of the epidemiological surveillance center of the Municipal Health Department of the municipality. Data was extracted by the Notification System for Notifiable Aggravations - Online (SINAN-online) in the years 2020 and 2021. **RESULT:** In the studied period, 442 cases of dengue were reported. With the emphasis on the female population (in 2020), and a prevalence of the white population (50%, in 2020) and mixed race (72%, in 2021), most of the diagnosed patients had the 1st to 4th incomplete grade of elementary school (4.23%). **CONCLUSION:** It was found that there was a drop in the number of notifications in the period studied, due to the COVID-19 pandemic in 2020 and 2021. The present study used a secondary source of information from the public health service, which makes it susceptible to inconsistencies, and further studies on the subject may be necessary.

Keywords: Dengue; Epidemiological Profile; arboviruses

1 INTRODUCTION

Dengue is an arbovirus, caused by the DENV virus, an RNA virus that belongs to the Flaviviridae family, of the *Flavivirus* genus, has four known serotypes (DENV 1; DENV 2; DENV 3; DENV 4), which are antigenically distinct, however serologically associated, and cause a systemic, febrile and acute disease, with a wide spectrum of symptoms (GUEDES; ROCHA, 2019).

Its transmission occurs by the bite of female mosquitoes of the species, to a lesser extent, *Aedes albopictus* and *Aedes aegypti*, the latter being the vector responsible for transmission in Brazil. After inoculation, the virus undergoes an incubation period of 4 to 10 days in humans, until the appearance of the first symptoms, which are generally debilitating but self-limiting, since most patients have a benign course, evolving with remission of symptoms and recovery, however a part of patients can progress to severe forms, including death (BRASIL, 2009).

The disease has three clinical phases: febrile, critical and recovery. The first manifestation of the febrile phase is high fever (39°C to 40°C), with an abrupt onset, associated with headache, adynamia, myalgias, arthralgias and retro-orbital pain. There may also be a rash with or without pruritus, anorexia, nausea, vomiting and non-voluminous diarrhea, in general most patients recover gradually and return to daily life (BRASIL, 2016).

The critical phase may be present in some patients and begins with the defervescence of fever, between the third and seventh day of the onset of the disease, accompanied by the emergence of alarm signs, which indicate a worsening of the clinical condition and can lead the patient to death, reason for the adoption of different measures of clinical management and observation in these cases. In the third and final phase, recovery, there is an improvement in the general condition of the patient, a reduction in symptoms and hemodynamic stabilization (BRASIL, 2016).

Currently being one of the most important arboviruses in Brazil and in the world, dengue has a high incidence in tropical and underdeveloped countries, whose environmental conditions favor the proliferation of the mosquito, due to its climatic, environmental and social characteristics (WHO, 2022). transmission in Brazil started at the end of the 19th century, the first known case occurred in the city of Curitiba - PR, with the first clinical and laboratory notification only in 1981 in Boa Vista - RR with the isolation of DEN - 1 and DEN - 4 serotypes (FIOCRUZ). Since its introduction, the virus has been a major national concern, causing epidemics in all Brazilian regions.

The emerging condition, categorized as the main arbovirus disease known in the country, is consolidated in an epidemic situation, as shown by data published in the epidemiological bulletin for the 2020s (979,764 cases, incidence of 466.2 cases per 100,000 inhabitants) and 2021. (534,743 cases, incidence of 250.7 cases per 100,000 inhabitants), where the Midwest region led the ranking in the two referred years with 1,200 cases per 100,000 inhabitants in 2020 and 616.8 cases per 100,000 inhabitants in 2021, in the first year, the Northeast region ranked 4th with 261.5 cases per 100,000 inhabitants and 2nd place in 2021 with 115.4 cases per 100,000 inhabitants. Such data confirm the Northeast region as one of the main areas affected by arboviruses.

In view of the above, it is pertinent to seek and characterize the most affected population and draw a clinical-epidemiological profile of the disease in the region, which is still poorly studied. Such knowledge will facilitate the identification of adequate preventive and therapeutic measures that must be implemented to meet the population defined as a risk and thus provide a better quality of life and health for them. Therefore, the general objective of the study was to verify the epidemiological-clinical profile of patients affected by acute febrile illness in a city in northeastern Brazil, describing its distribution and general characteristics of the cases.

2 METHODOLOGY:

The study is descriptive, cross-sectional retrospective, with patients infected by DENV, in the city of Picos - PI. Located in the central-south region, the city has 577,284 km², a hot/dry climate and is considered a strong commercial hub and a reference in the macro-region. The population is 78,627 inhabitants, with an estimated population density of 137.30 inhab /km² (IBGE, 2021).

The data were extracted by an employee of the Epidemiological Surveillance Center of the Municipal Health Department of the municipality, secondary data, consisting of identification data and classification items from the records, based on the SINAN's own dengue and chikungunya investigation form, these forms they are standardized and incorporate relevant data about the disease, the affected patient, clinical and laboratory information, as well as alarm signals and important complementary information. Of the dengue and chikungunya cases, only confirmed dengue cases were considered, by clinical-epidemiological and laboratory criteria (Hilab Remote Laboratory Test of Dengue NS1 and by IgM serology), notified in the Information System of Notifiable Diseases-Online (SINAN-Online), from January/2020 to December/2021 in Picos-Piauí.

The incidence coefficient (CI) of dengue was calculated per 1,000 inhabitants, using the population residing in Picos in the last year of 2021 as the denominator, according to data available from the SUS Department of Informatics (BRASIL, 2022).

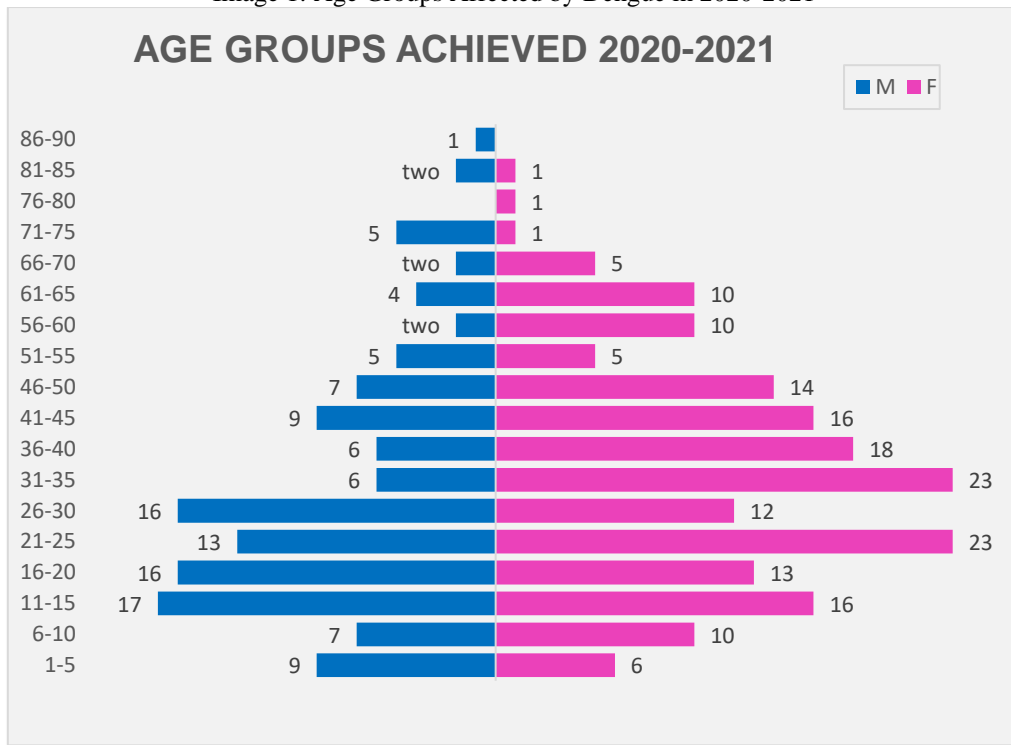
Then the information provided was tabulated in *Microsoft Excel spreadsheets* (2019), from which it was possible to build tables and graphs to clearly demonstrate the municipal epidemiological situation regarding the theme.

All research followed the rules established by Resolution No. 466/2012 of the National Health Council.

3 RESULTS:

Of the total measured in the sample, 72 suspected cases of dengue were reported in 2020, of these 14 were confirmed, in 2021, 370 cases were reported and that year 297 were confirmed. In the two years surveyed, the female population was the most affected, leading, in the first year, 10 of the 14 diagnosed cases; in the following year with 174 cases (51 cases more than the male population), as shown in image 1. Of the total number of confirmed cases in both years, only 08 pregnant women were affected, all in 2021.

Image 1: Age Groups Affected by Dengue in 2020-2021



Source: Prepared by the authors, 2022.

In 2020, the white population occupied 50% of the diagnoses, followed by the brown color (36%), in the following year the brown population led the ranking with 72%, followed by the white population (24%), in terms of education, in 2020 the most of the diagnosed patients had incomplete 1st to 4th grade of elementary school (4.23%), as shown in table 1.

The cases were confirmed by laboratory and clinical epidemiological criteria, with IgM serology being the most used of the laboratory tests, of those confirmed, all evolved to cure; in 2020, 2 hospitalizations were reported, in 2021 the number increased to 34, with a greater number of dengue with warning signs and 3 cases of severe disease, as shown in table 1.

TABLE 1: Characteristics of dengue cases reported in the city of Picos-PI in the years 2020 and 2021.

Race
 White
 Black
 Asian
 Indigenous people
 Mixed race
 Ignored
 Schooling
 1st to 4th grade incomplete in elementary school
 4th Grade complete in elementary school
 5th to 8th grade incomplete in middle school
 Middle school complete
 Highschool complete
 Highschool incomplete
 Higher education Complete
 Higher education incomplete
 Don't apply
 Ignored
 illiterate
 Empty
 Confirmation criterion
 Laboratory
 Clinical Epidemiological
 Dengue types
 Dengue
 Dengue with signs
 Grave dengue
 Hospitalization
 Yes
 No

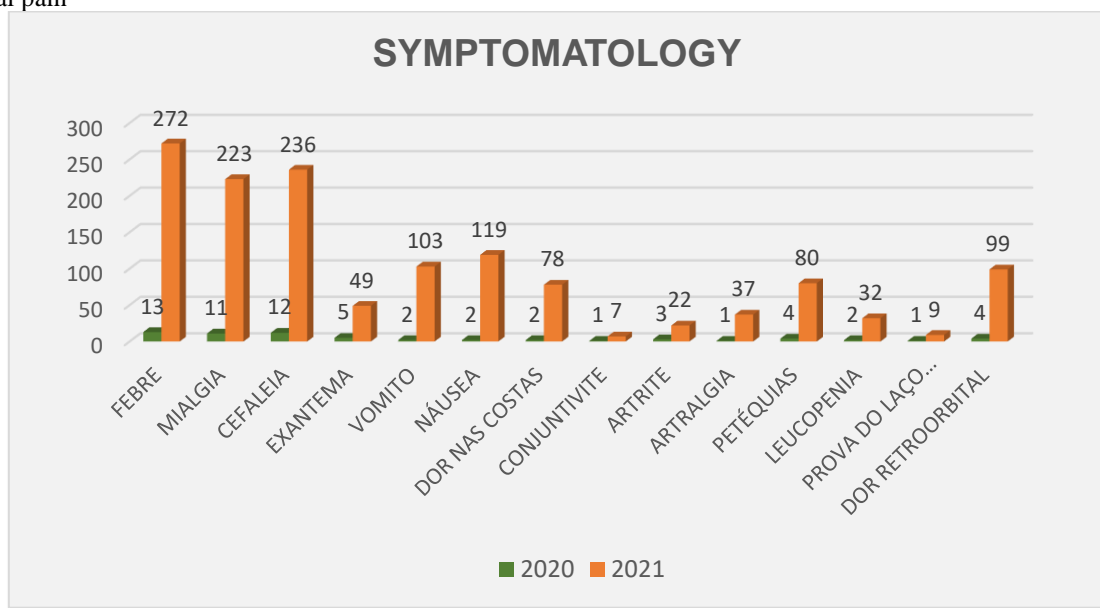
RAÇA	2020	%	2021	%
BRANCA	7	50%	71	24%
PRETA	2	14%	11	3%
AMARELA	0	0%	0	0%
INDÍGENA	0	0%	1	0,33%
PARDA	5	36%	213	72%
IGNORADA	0	0%	1	0,33%
ESCOLARIDADE	2020	%	2021	%
1ª A 4ª SÉRIE INCOMPLETA DO ENSINO FUNDAMENTAL	3	21%	32	10,70%
4ª SÉRIE COMPLETA DO ENSINO FUNDAMENTAL	0	0%	8	2,60%
5ª A 8ª SÉRIE INCOMPLETA DO ENSINO FUNDAMENTAL	1	7%	35	11,78%
ENSINO FUNDAMENTAL COMPLETO	1	7%	11	3,70%
ENSINO MÉDIO COMPLETO	3	21%	59	19,86%
ENSINO MÉDIO INCOMPLETO	0	0%	25	8,41%
EDUCAÇÃO SUPERIOR COMPLETA	1	7%	36	12%
EDUCAÇÃO SUPERIOR INCOMPLETO	0	0%	15	5%
NÃO SE APLICA	4	29%	18	6,60%
IGNORADO	1	7%	51	17%
ANALFABETO	0	0%	2	0,60%
VAZIAS			5	1,68%
CRITÉRIO DE CONFIRMAÇÃO	2020	%	2021	%
LABORATÓRIO	13	92%	231	78%
CLÍNICO EPIDEMIOLÓGICO	1	8%	66	22%
TIPOS DE DENGUE	2020	%	2021	%
DENGUE	13	92%	285	96%
DENGUE COM SINAIS DE ALARME	1	8%	9	3%
DENGUE GRAVE	0		3	1%
HOSPITALIZAÇÃO	2020	%	2021	%
SIM	2	14%	34	12%
NÃO	12	86%	255	88%

Source: Prepared by the authors, 2022.

The individuals analyzed in consecutive years (2020 and 2021) obtained, after clinical evaluation, the following classification of symptoms:

Figure 2: Main symptoms of dengue in 2020-2021

- Fever
- Myalgia
- Cephalalgia
- Rash
- Vomit
- Nausea
- Backache
- Conjunctivitis
- Arthritis
- Arthralgia
- Petechia
- Leukopenia
- Tourniquet test
- Retro-orbital pain



Source: Prepared by the authors, 2022.

4 DISCUSSION

Between 2019 and 2020, dengue proved to be a disease with very striking characteristics, it predominated in the Midwest region, with 920.4 cases/100,000 inhabitants, which concentrates the main urban centers in Brazil with Goiânia. and Brasília occupying the top of the ranking in number of cases, reinforcing the theory that the mosquito that transmits the disease has a preference for urban environments, which has a welcoming sociodemographic structure for its reproduction, with poor sanitation in areas of social vulnerability and tropical climate, increasing its reproduction and consequently the number of infections (BRASIL, 2020).

The Northeast is in third place with 261.5 cases/100 thousand inhabitants, with a semi-arid climate and prevalence of a less favored economic class with low education, which already has a greater propensity to spread dengue cases, due to the lack of adequate water drainage, common in areas of poverty. This

situation is confirmed on a chronological scale, considering that between 2008 and 2017 there were 963,862 deaths, second only to the Southeast region (NORÕES et al., 2021).

When analyzing the notifications of dengue cases in the year 2020 and 2021 in the city of Picos, there was a significant increase between the years (difference of 283 cases). Analogous to these data, the Ministry of Health presented in its epidemiological bulletin a unanimous decrease across the country, where there was a drop in probable cases of dengue in 2020 compared to 2019 (Brasil, 2020). This decline can be explained by the expansion of actions aimed at fighting Covid-19, which caused the delay in the underreporting of arboviruses, by the lower demand for health services due to the fear of the infectivity of the SARS-Cov-2 virus, or even even due to the clinical similarity with some of the symptoms of dengue and Covid, which may have made it difficult to close the diagnosis (DE SOUSA et al., 2022).

Regarding sociodemographic conditions, in relation to sex, a remarkable prevalence of the female public was observed, representing more than half of the cases in 2020 and surpassing the male sex in 2021, a result compatible with other northeastern states in different years, as in Maranhão, where women accounted for 65% of cases of dengue infection in the state (2017) and in the state of Ceará, which had a higher proportion of women with the disease, with a variation of 5% to 10% more female cases with dengue between 2017 and 2020. However, in 2013 and 2015, the State of Bahia observed an inversion in this pattern, where the highest prevalence of dengue infectivity occurred in males (COSTA et.al, 2019). & VERA et.al, 2020 ALVES, 2021).

The supposed predilection for women may be related to the frequency of this public in a peridomiciliary environment, where the outbreaks are more commonly found, and also to the greater demand of this public for health services, making the diagnosis more frequent and easier compared to the male population that presents greater resistance to this search. However, dengue is not directly related to sex, and for this reason there may be differences in results with other studies (COSTA et.al, 2019 & VERA et.al, 2020)

As for the variable referring to the number of pregnant women affected by dengue, the municipality of Piauí reported only 08 cases of dengue in pregnant women in the years 2020 and 2021, representing only 2.57% of the total confirmed cases in the two years. birth et. al., 2017 notes the occurrence of more than 40,000 confirmations of dengue diagnoses in pregnant women in Brazil between 2007 and 2015, also stating that in that period the lethality of pregnant women with arbovirus exceeded the number of deaths of women in non-pregnant childbearing age, also classifying the third trimester as the one with the highest risk of complications such as preeclampsia, eclampsia, hemorrhage and maternal death. In reference to cases confirmed by clinical criteria, in pregnant women, the risk of death increases by three times; being eight times higher in the case of laboratory confirmed cases (Fiocruz, 2018).

There is a prevalence of dengue cases in the mixed-race and white population. In agreement with Oliveira et. al., 2020, which points out the races mentioned above as the majority in the diagnoses of acute febrile illness in the State of Maranhão. Also in agreement with the results of the research carried out by

the authors, in the Northeast region, between January 2008 and December 2017, the mixed race remains the most affected by acute febrile illness, with about 14.3 million diagnosed in that same period. time interval, the white race was the second most affected, with 2.2 million confirmed cases (Norões et al., 2020). According to Pereira et. al., 2008 – the greater involvement of whites and browns can be explained by the fact that they are more susceptible to illness by the flavivirus under study, with blacks being more resistant to the installation of the virus and the development of the pathology.

The clinical presentation of dengue symptoms is variable, however, there is a consistent line of thought among researchers, that the first symptom to manifest is a fever above 39°C with an abrupt onset and the presence of a macula-papular rash in the region. of the trunk. These are the classic symptoms for the early identification and treatment of dengue. In classic dengue, the importance of recognizing the symptoms and signs that point to an evolution of the disease is also emphasized, these are abdominal pain, hypothermia of sudden onset between the third and seventh day and the reduction in the level of consciousness.

As for education, the data denoted the prevalence in people who have an education level from the 1st to the 4th year of incomplete elementary school and complete high school, this result may be related to the reduced knowledge regarding prevention and care with dengue , considering that the lower the level of education of a population, the less knowledge about the aspects of the disease (CUNHA, 2012). In addition, a considerable percentage was presented in the municipality of Picos in the following categories: Not applicable (29% and 6.60%) and ignored (7% and 17%), in 2020 and 2021 respectively, a result also evidenced in a study carried out in the State of Pernambuco, representing 68.9% of blank or ignored fills (2015 – 2020). (DE LIMA FILHO et.al, 2022). This non-completion makes it difficult to delineate this variable, since this notification can improve the understanding of the epidemiological profile to promote disease prevention and control measures. This point demonstrates a necessary agenda for the discussion of health professionals and managers (VERA et.al, 2020).

5 FINAL CONSIDERATIONS

Considering the epidemiology of dengue in Brazil in recent years, and the drop in the number of notifications for dengue in 2020 and 2021, the hypothesis of a possible underreporting of dengue cases due to the COVID-19 pandemic is raised. In addition, the actions of dengue control programs during the period carried out in the region should be analyzed. Both variables are important for a more concrete assessment related to the decrease in dengue cases.

Furthermore, it is noteworthy that the present study had as a source of information, secondary data from the public health service, susceptible to inconsistencies, requiring further studies on the subject to assess possible divergences.

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CHAPTER 88

Implementation of free and open-source geotechnologies in a sanitation company

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ABSTRACT

This work describes the implantation of free geotechnologies, using free and open-source software, to disseminate the geospatial information of the Bahia Water and Sanitation Company (EMBASA). EMBASA is the concessionaire responsible for basic sanitation in the State of Bahia. This article also describes, besides implantation, an analysis of the saved costs by the company over the years.

Keywords: geotechnologies, free software, basic sanitation.

1 INTRODUCTION

Geotechnology is a type of information technology, which works with data geographic and technologies correlated with This one type in given away. Among at geotechnologies, the Geographic Information Systems (GIS), the in management in banks in Data Geographical (SGBD), O Global Positioning System

(GPS), the Georadar and the orthophotos (Aragon & Campos, 2009).

Lately, at geotechnologies has awakened much interest of companies, what manage infrastructure. This is because they allow the manipulation of information spaces aimed at tackling complex demands that involve geographic coordinates (Martin, 2019) (Aragon, 2020).

In the context of geotechnologies, GIS stands out. This special type of system of information allows the spatial view of the information associated with the databases geographic. A GIS can be applied in several analyzes contemplating demands operational, tactics and strategic (CHAMBER, 1996).

Despite the known benefits from a GIS implementation, the The implementation process of this type of system involves high costs of licensing software , demanding of organizations to need in hiring in consulting specialized services (Aragon, 2020). As a result, few companies are able to implement a GIS in set with your area of technology gives information. Aiming mitigate you high costs in licensing, one alternative It is O use and adoption in software free (SOFTWARE FREE, 2022).

it is understood per software free, all program in computer what allows O your use unrestricted. O software free he must to allow, also, what O your code source be open. This one type in software , generally, It is sustained per several developers scattered in several countries (Aragon & fields, 2009) (Martin, 2019).

In this context, this article describes the implementation of free geotechnologies, in in particular, GIS and DBMS based on free and open software allowing the company save on software license costs. This article describes the process of implantation in one company of sanitation basic of state gives Bahia in Brazil.

2 MATERIALS AND METHODS

In the first phase of the project, a survey was carried out on which best free, open and free technologies that were available and with a community active. Have a community of developers keeping the project free software active and up-to-date is something fundamental for the choice. In this research, priority was given to software that did not require licensing costs (FREE SOFTWARE, 2022) (DAVIS, 2007). This was a criterion established for the implementation of geotechnologies in the projects of the company EMBASA, which was used as a case study of this job. Therefore, technologies what, although free, demanded any value for use were

2.1 DISCARDED.

Among the technologies studied, the GeoMoose environment was adopted with the MapServer map server, QGIS and the PostGIS Database (GEOMOOSE, 2022) (QGIS, 2022). It was noticed what these technologies are free, open, without costcom license and robust. It was observed with the research, that they are used in several large companies, especially QGIS (ARAGÃO and CAMPOS, 2009) (Martin, 2019). Finally, the costs of licenses of proprietary software were surveyed aiming estimate the value saved by the company to to adopt software free.

3 RESULTS

The adoption of free software for the implantation of geotechnologies in the EMBASA made the geographic data more accessible per a larger number of users (EMBASA, 2022). It is implementation allowed democratizing the use in systems in information geographic arriving The users experts and no experts. At gestures commercial and operational, for example, have been improved. These will be described below. improvements.

Company managers can use geographic data in the geographic information to visualize consumers and their correlated data. Consumers can be spatially grouped according to their type (residential, industrial or large consumer). This can be arranged in the form of thematic maps, that allow the use in Colors aiming to filter spatially the consumers.

Figure 1 shows an example of a thematic map. In this figure, the user can view the inhabited, under construction, uninhabited properties, among others, according to the legend that can also be seen in Figure 1. In this way, it is possible to perceive concentration of inhabited properties in certain parts of the city and prioritize the supply in these regions. As a background on the map, you can view the orthophotos of County, this It is, images georeferenced, O what check larger wealth in detail in analysis geographic.

Figure 1: view of a thematic map from properties

- UMF property Situation
- Habitated
- Construction
- Inhabited
- Ceased Construction
- Demolished
- Temporary Occupation
- Ruins.
- Terrain



Figure 2 shows the same map as Figure 1, but with an operational view. In Figure 2, the drinking water distribution networks can be visualized in blue. In addition Furthermore, by clicking on each line in blue, the user will be able to access operational data of networks of water supply as diameter, material and extension.

Figure two: map showing at networks of water supply

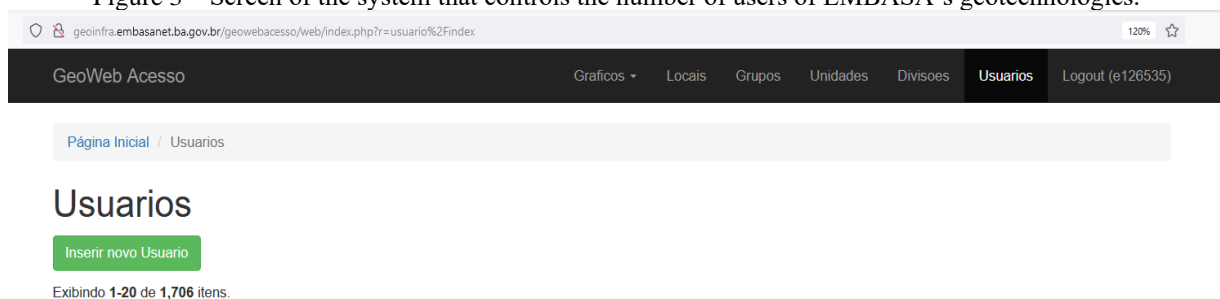


Figures 1 and 2 show the GIS screens based on free geotechnologies and free. No there was none cost with O licensing of software for O development of these systems. Two examples of use can be seen that allow better management commercial and company operating.

Geotechnologies help managers in decision making. they can do analysis spatial complex involving questions as: Where they are concentrates my consumers? Where is my water supply network infrastructure and sanitary sewage? The use of a GIS tool is essential to respond to questions like these. Tabular data without an associated spatial view is not enough to answer The these questions, that involve the aspect geographical.

Currently, the geographic information systems implemented at EMBASA have 1706 registered users, which represent almost 40% of the employees of company (Figure 3). Therefore, The company allows what 1706 users use at geotechnologies without any costs with license in software .

Figure 3 – Screen of the system that controls the number of users of EMBASA’s geotechnologies.



If the company wants to add new users over time and meet all The force in job gives company, no there is none off-side, then all at technologies are based free. Therefore, it is concluded that the adoption of free software allows to the project be scalable.

For It is made comparative, case were adopted a software owner, what has a cost in lathe in 100 dollars to year, per license, this It is, per user, The company it would have what deal with a cost of approx. 170,600 dollars per annum. O project is implemented since 2007 and the projection of the economy is of 2,559,000 dollars during these years old. This one value saved he can to be directed for The update of park technological, as well as for others demands of the area in technology.

3 CONCLUSIONS

THE implantation of geotechnologies described in this article allowed O development of geotenological solutions that serve users without adding costs for the company. It is worth noting that the technologies described in this article were based software free, open and free.


It is concluded that, as it is based on free and free technologies, the project enabled significant savings for the company. Furthermore, these technologies they can to be personalized for others contexts, making O project scalable of Score in economic and functional point of view. The following future work is pointed out: the realization analysis to study whether the technologies described in this article allow the expansion of functionalities without add complexity in development.

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CHAPTER 89

Information management and crisis: reflections on communication in the case of “Brazilian terrorists” – Rio 2016 Olympics

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ABSTRACT

The objective of this article is to carry out a critical analysis of the information management process based on the case of the “Brazilian terrorists”, which took place in parallel with the preparations for the Rio 2016 Olympic Games. of information management in critical situations, the article aims to analyze the conduct of Brazilian authorities to protect their interests without affecting the relationship of trust with society, mainly through planning for the treatment and dissemination of information.

Keywords: Communication. Information management. Network society. Crisis management. Information.

1 INTRODUCTION

The concept of information defended by BARRETO apud XAVIER and COSTA (2010) is defined as "a significant structure with competence and intention to generate knowledge in the individual and in his group, enabling his development and well-being". This view corroborates the ideology in which information fulfills a physicalist bias, in the sense of information as a thing (*information-as-thing*) by Buckland; a cognitivist bias, recognizing the importance of the individual and his psychic interaction in managing information and generating knowledge; and its social bias, which assesses the environment in which the knowing individual interacts.

SILVA and JUSTAMAND (2021) remind us that the coexistence with information through the media is an intrinsic process and serves as an extension of our senses. “We have moved from a community society, in which everyone knows each other and knows the information among themselves, to a joint-stock company”. This stage we are in, for the authors, is conditioned by urbanization and the process of massification of the media, which produce information and tend to guide themes of common interest.

It is inferred, then, that this process - the production of information and, therefore, of knowledge and its dissemination - has a natural flow, which often occurs in the unconscious of everyday social life. However, there is a condition that it be handled by whoever, having privileged access to certain information, cuts it off and promotes partial access.

Managing this flow is a major challenge in our age. Scholars note that since the 20th century, with the strengthening and rapid dissemination of Digital Information and Communication Technologies (ICTs), there has been the possibility of a disorderly production and dissemination of an exponential amount of new content. This factor generates an overload of information, which makes it difficult to handle the so-called “strategic” information.

Figura 1 - Montage with cover of the newspaper "O Estado de São Paulo" of July 17, 2007. On the left, original cover and on the right, fictional cover edited by the authors.



1. Airplane explodes killing 176 in Congonhas; Biggest accident in the country’s history; TAM’s airplane couldn’t stop on the wet runway and exploded against a building; The airbus was coming from Porto Alegre
2. Deposit stroke by TAM’s airplane contained radioactive material from IPEN; 125 Iodine seeds were at the place; The material belonged to a research group from the Nuclear Research Institute in SP; IPEN didn’t declare its position about the fact.

Such reflection becomes even more relevant when communicating – which for CASTELLS (2015) is to share meaning through the exchange of information – in crisis situations, which put the image of corporations and organizations at risk in society. In a hypothetical condition – as illustrated in the image above – that would involve the Institute for Energy and Nuclear Research (IPEN) in Brazil, what information should be brought to the public to maintain order and stability without exposing information considered critical by the institution?

Seeking this forecast involves a series of variables that go through economic interests, social stability and maintenance of credibility, variables that do not allow impromptu actions in the treatment of information and in its management. For this article, we seek to cut an episode of recent Brazilian history, in order to analyze the communication strategies adopted with the public and their implications.

2 OBJECTIVE

To make a critical analysis of information management during the Rio 2016 Olympic Games by the Brazilian State. To analyze, based on what was published in the media, the actions carried out during the “Brazilian terrorists” episode, based on concepts and recommendations from manuals in the area, especially from the IAEA, and from the Law on Access to Information in Brazil. Propose actions that bring improvements in the management of information in crisis.

3 METHODOLOGY _

The proposal of the article will be made in the model of a case study, with a direct approach and bibliographic base. Such choice is justified in the intention of registering, examining and correlating facts or phenomena. For this, concepts of information management guides and other documents in the area will be opposed to the statements and behaviors of the authorities and others involved in the case under analysis, seeking to counter this communication reaction to the theoretical aspects of information management and the guidelines perceived in the manuals .

4 DISCUSSION

In 2009, Brazil won the right to host the Games of the XXXI Olympiad, a competition that would take place for the first time in South America. Among the many preparations to promote the sporting event were security-related measures. This topic gained greater relevance months before the start of the Rio 2016 Games, due to terrorist attacks that took place on the European continent, especially in France and Belgium.

The occurrences opened precedents for the inference that the Olympics were a potential target of this type of action, combining the global context of the attacks with an increase in the adhesion of Brazilians to the ideology of the Islamic State. In April 2016, the Brazilian Intelligence Agency (Abin) confirmed that the risk of attacks in the country had increased due to migratory facilities and the increased use of the internet as a mechanism for action. The Agency also confirmed the authenticity of a profile on a social network where Frenchman Maxime Hauchard, a member of the Islamic State, said that Brazil would be the organization's next target.

On the first day of July of that year, Abin's concern was no longer with attacks of great sophistication and logistical complexity, but with the so-called “lone wolves”¹. At the time, the Agency indicated that it was focused on monitoring individuals who showed radicalization behavior by ideologically aligning themselves with the Islamic State. The disclosure was also supported by the discovery of a communication channel in Portuguese for the exchange of information about the terrorist group in a messaging application, this factor being interpreted “as a door for Brazilians to be radicalized”.

At the same time, a consulting firm specializing in actions by extremist groups on the internet reported that the Islamic State (IS) and other jihadist groups were inciting their followers to promote terror in Rio de Janeiro. They offered specific advice on how to attack using drones with small explosives, traffic accidents or through the use of poisons and medicines.

The fact that Abin exposed this data generated strong criticism from the Secretary of Public Security of Rio de Janeiro at the time, José Mariano Beltrame. “When we have investigations of important things to do, we don't talk. People show results. In my view, it should not have either confirmed or disconfirmed.”

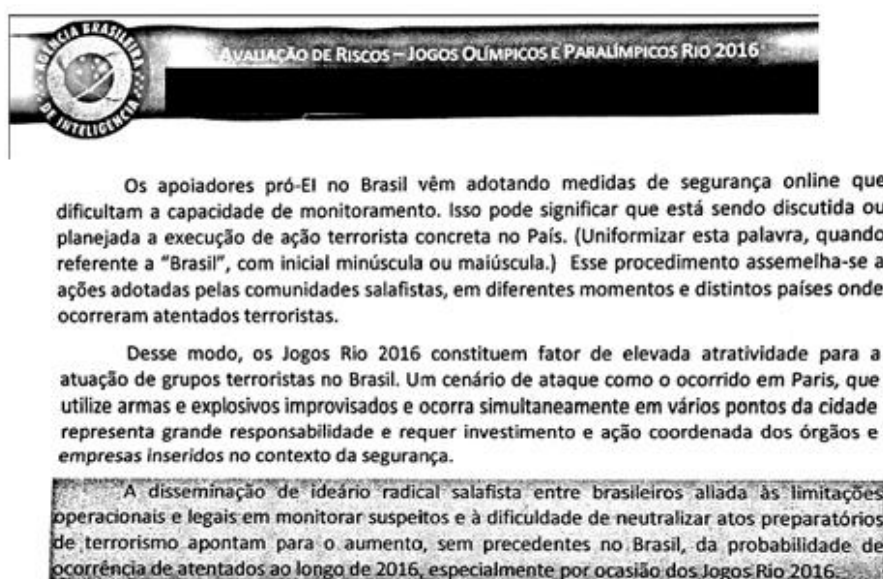
¹A “lone wolf” is a terrorist who acts alone, at the time and place he deems convenient.

The lack of consensus was not only in the handling of disclosures between Brazilian authorities involved in security issues. On July 8, 2016, the then Defense Minister declared that “no intelligence agency in the world has traced the possibility of a terrorist attack during the Olympics”, contradicting the reports and information released by Abin.

The contradiction gained new life when an official report by the French government's intelligence agency disclosed that the Islamic State terrorist faction had planned attacks on the French delegation during the Games. Reported by the press in July, the information had been given by General Cristophe Gomart in May, during the session of a parliamentary commission. According to him, there were indications that a Brazilian could have been behind the planning of these attacks, and the identity of this individual was not clear.

Almost thirty days earlier, Veja magazine had already named one of the priority targets of Brazilian surveillance in the fight against the threat of terrorism in the national territory. It was Ismail Abdul Jabbar Al-Brazili – or, simply, “The Brazilian”. According to the report, he was one of those responsible for supplying the propaganda channel with texts in Portuguese (released by Abin days later), in addition to being a Brazilian fighter for IS. The report also included excerpts from a reserved report authored by Abin and distributed to the authorities involved in the Games' security scheme.

Figure 2 - Copy of Abin's report published by Veja Magazine in 2016



The IS supporters in Brazil have been adopting new online security measures that make it difficult to monitor them. It might mean that the execution of a concrete act of terrorism in the country is being discussed or planned. (Unify this word when referring to “Brazil”, with capital or small initial.) This process is similar to the actions adopted by the Salafi community in different moments and countries where terrorist attacks occurred.

This way the Rio 2016 games establish a factor of high attractivity for the actions of terrorist groups in Brazil. An attack scenario like Paris, which use improvised guns and bombs and happen simultaneously at different points of the city represents great responsibility and demands investigation and coordinated actions by companies and agencies present in the security context.

The dissemination of radical Salafi ideology among Brazilians allied to the legal and operational limitations in monitoring suspects and the difficulty in neutralizing preparatory acts of terrorism point to an unprecedented increase in the probability of attacks occurring throughout 2016 in Brazil, especially due to the Rio 2016 game

On the 21st of July another state authority enters the scene. The then Minister of Justice, Alexandre de Moraes, announced that the Federal Police had launched Operation *Hashtag*, carried out simultaneously in 10 Brazilian states. It resulted in the arrest of 10 Brazilians suspected of preparing terrorist acts for execution during the Olympics.

According to him, the intelligence service proved that the arrested group went from simple comments on messaging apps to, in fact, "preparatory acts" for the attack. At the time, the minister did not detail what exactly supported this certification. He also stated that the members had sworn an oath of loyalty to IS over the internet, that the group had exchanged messages commemorating attacks in France and the United States and that one of them had contacted a website in Paraguay to purchase an AK 47 rifle.

Commenting on the arrests, the then Defense Minister, Raul Jungmann, said that the group of prisoners was amateur and that they had no direct contact with IS. According to him, they were people with no tradition for the practice of terrorism and without any evidence that could be used as preparation or history of action. Even so, he stated that the group would have to pay a very high price, "because a preparatory act can be up to eight years in prison. For terrorism you go up to 30 years in jail. The penalties are tough. And here, a warning to anyone who wants to follow this path: we are monitoring, especially social networks, all of them, in this regard".

On July 22, an 11th suspect turned himself in to police, who confirmed they had received an FBI alert² about suspects who were detained in Brazil. In common, they all had a devotion to the Islamic religion and the use of false names on the internet, in addition to the fact that some of them knew each other, which could reinforce the thesis of a possible articulation for carrying out a terrorist action.

On the same day, Sheikh Ahmad Al-Khatib was coerced by the Federal Police to testify about his proximity to two of the arrested suspects who had been his employees in the past. Owner of a furniture factory and responsible for the NGO Núcleo Islâmico Livro Aberto, he and his family had cell phones, computers and tablets confiscated by the police. In his words, the two suspects were Islamic State sympathizers, but he was skeptical of the possibility of both participating in terrorism. For him, the action of the police was hasty. "If they were called to testify, they would go of their own free will," he said.

An analysis of the information management procedures adopted by the State bodies that were related to the event and their possible alignment with the theoretical ideal of communication indicate that controversies marked this process. One of them is the fact that the Minister of Justice called a press

²The Federal Bureau of Investigation (FBI) is the equivalent of the Federal Police of the United States. According to JORDÃO (2017) in this episode, the FBI basically "informed the PF about the virtual profiles of nine people who were, according to the American agency, propaganda for IS on media such as Facebook, Twitter and Google Plus. Upon provocation by the FBI, Deputy Guilherme Torres, from DAT, ordered his agents to carry out an initial search in open sources, to identify these profiles. In the following three days, police officers would deepen information on four of the suspects named by the FBI, in addition to expanding the list of investigated".

conference to detail an operation that was under judicial secrecy. Apparently, the disclosure of the arrests was made at an inappropriate time.

“ Started 15 days before the start of the Games, and a week after the attacks in Nice, France, with extensive news coverage, Operation Hashtag found public opinion already sensitized to the topic of terrorism” stressed JORDÃO (2017). Furthermore, the typification of the crime presented had very fragile bases that were not confirmed. JORDÃO recalls that one of the evidences for the arrests was the attempt to buy a rifle by one of the suspects.

The evidence, it turned out later, referred to an email actually sent to a store in Paraguay, but in 2015, and not on the eve of the Olympics, as Moraes suggested. The purchase did not materialize. The minister would rush once again to the press conference by wrongly attributing the leadership of the alleged cell to a suspect detained in Paraná, Levi Ribeiro Fernandes de Jesus, 21 years old – a fact that was not proven in the PF investigations.

The operation also had three ostensible phases in the month of August, during the Games, and away from the press spotlight. In total, another 15 people had temporary arrest decreed, of which eight were denounced by the Federal Public Ministry (MPF) and became defendants. The thesis that there was a planned attack on the Olympics, however, was never confirmed.

The MPF prosecutor, Rafael Miron, recalls that there were exchanges of messages and a very strong intention to do so, but no facts. “ In reality, conversations mostly revolve around discussions about IS, commemorations of attacks in Europe and effective methods of communication.”

The complaint signed by the prosecutor contains several images and more than 60 excerpts of dialogues or sentences extracted from the conversations intercepted between the group of suspects, seven of which contain some kind of mention of the Olympic Games. The most extreme of them points to the intention to contaminate Rio de Janeiro's water resources ³.

When arrested, these Brazilians suspected of terrorism did not carry chemical materials, explosives or weapons. Eight of them were denounced by the Federal Public Ministry (MPF) based on articles 3 and 5 of the Anti-Terrorism Law. Leonid El Kadre de Melo was the only one to answer for the fifth article (carrying out preparatory acts of terrorism), in addition to being appointed – after Levi Ribeiro – as the leader of the group. Leonid was the oldest of the group and the only one with a criminal record (he served time for murder). He was on parole and was with his brother, Valdir Pereira da Rocha, when they were both arrested.

³survey carried out by JORDÃO (2017) indicates that “the idea of an attack that would poison the waters of Rio is, to say the least, unreal. The Guandu Water Treatment Station, located in Nova Iguaçu (RJ), is responsible for supplying 85% of the water in the city of Rio de Janeiro, serving 9 million locals. From there, 3.6 billion liters of water come out per day. Poisoning a source of this magnitude would require, according to experts consulted by Pública, 90,000 liters of chemical solution capable of causing toxicity, or something like six medium-sized water trucks”.

Leonid's temporary detention ⁴was revoked in September 2016, after the Federal Public Ministry deemed his participation in the episodes secondary. His brother Valdir was not so lucky. An inquiry by the Civil Police of Mato Grosso indicates that he was beaten to death by about 20 inmates at the Várzea Grande Public Prison. The reason for the lynching was “the fact that he was a terrorist”, a condition not accepted by the “code of ethics” of the criminal world.

5 CONCLUSION

The case of Brazilian “terrorists” shows a series of dissonances when we analyze the information management process in opposition to theoretical assumptions. One may question, for example, the responsibility of the authorities when coining the term “terrorism” to name those still suspected of a crime that, in the course of the facts, was not confirmed. In doing so, considering that at the time of the announcement there was still an investigation in progress and under judicial secrecy, there is an anticipation of fundamental steps to maintain transparency (in the sense that the information disclosed is true) and openness (in the meaning to reveal only what is essential).

By opting for early disclosure, the principle of maintaining a sense of social stability was put at risk, as the possibility of panic in the population was increased. The promotion that Brazilians were aligned with terrorist groups and with the possibility of carrying out extreme acts – although this possibility was far from happening in practice –, may also have impacted the decision of foreigners to go to Rio de Janeiro to follow the games.

Although at the time the mayor of the city, Eduardo Paes, had a positive assessment of this factor with data that pointed to the visit of 1.17 million tourists, 410 thousand from abroad, a report by Euromonitor shows that these numbers were timid⁵. The observation is that the major sporting events in Brazil (the 2014 World Cup and the 2016 Olympics) did not place the country on the Latin American tourism route. There are certainly many factors that can influence this issue and the feeling of security is inevitably relevant.

Finally, the disclosure by the authorities that there were “terrorists” in Brazil, even if their methods were ineffective in carrying out extremist acts, could create a problem that does not exist insofar as it programmed the communication network of the society and generated a new node of influence. People

⁴In 2017, “Leonid El Kadre de Melo was convicted under Article 5 of the Anti-Terrorism Law, referring to 'recruitment for the purpose of committing acts of terrorism'. He was sentenced to 15 years, 10 months and 5 days in prison, the longest sentence of all. Recruitment, according to the judge, took place through virtual means, and in 'the frequency with which he addressed others and his frequent insistence that they form a terrorist cell in the state of Mato Grosso'. He was charged with the crime of recruiting 'encouraging, recruiting', 'individuals and organizing people with the purpose of forming an ISIS action group in Brazil to carry out acts of terrorism'. In his sentence, the judge notes that this type of crime (recruitment) is of 'anticipated consummation', that is, it is not necessary to 'effectively go to the place where they were called'. In addition to him, eight other defendants were convicted on the basis of article 3 for “promotion of terrorism” and “criminal association”.

⁵According to the report, Brazil had a “modest” annual growth of 3% in the number of foreign arrivals between 2012 and 2017, against almost 6% in Costa Rica, 8% in Mexico and 10% in Chile and Colombia.

seeking notoriety, unhappy or otherwise, could be influenced by media coverage and be induced to commit crimes that perhaps were not even planned.

The conduct of this case also shows that there is no more room for improvisation in communication policies. The establishment of the network society makes it clear that the information management process needs to be professionalized by the authorities, bodies, and entities that need to be prepared to protect their assets, their power, and their ability to influence their partners and society.

If the culture used to be reactive, of action after the establishment of the critical fact and its consequences, the current panorama of a society that is quickly permeated by the speed of flow of information, requires that these actors (authorities, companies, and public entities) are previously prepared to condition their processes and establish doctrines that are capable of pragmatizing the methods to be used and protecting their image and reputation.

History demonstrates that the Olympics took place in Rio without any act of terrorism. An analysis of the way in which the information was managed, however, indicates that there is an opportunity to re-evaluate the communication and publicity procedures of sensitive factors related to crisis situations.

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CHAPTER 90

Organic-based material as an alternative for packaging food products

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ABSTRACT

Contemporary society is increasingly being marked by discourses on the environment, sustainability and the need for sustainable and ecologically correct consumption. For this discourse, organic food has gained more prominence in the Brazilian and world scenario. With the growing demand for these products, the changes arise on the packaging. Knowing that the world's plastic industry has been increasing, causing serious environmental problems due to its inability to biodegrade; the use of renewable resources has been exploited, which can reduce waste disposal costs.

1 INTRODUCTION

"Organic farming" (or "organic" or "ecological" agriculture is a complete system approach based on a set of processes that result in a sustainable ecosystem, safe food, good nutrition, animal welfare and social justice (IFOAM, 2009).

A food is considered organic when it is produced in an environment based on agroecological production processes that make responsible use of soil, water, air and other natural resources, while also respecting social and cultural relations. Differing from the conventional by the absence of pesticide residues keeping the soil healthy and observing the controllable levels of pests to increase their crops (Boobalan et al., 2016).

The consumption of organic food has been proposed as a way to a more sustainable society. As a result, the purchase and consumption of organic food has been increasing worldwide. According to (FiBL and IFOAM, 2022), the organic market in the world expanded from 15.1 billion euros in 2000 to 120.6 billion in 2020 (Dorce et al., 2021).

The packaging act in its context and functions is of great importance to organic foods mainly, both in transportation and in its protection against contaminant agents, and it is an integral part of this growing

Consequently, the development of biodegradable materials of organic base emerge as an alternative to this and malagem. Therefore, this study aims to present a narrative bibliographic survey addressing the theme related to organic food and biodegradable and organic packaging. For the narrative review, research was conducted in databases such as: SCIELO, Science Direct, PubMed and national and international websites related to the theme. Based on the study, among the alternatives for the production of an organic-based film, starch is one of the bases that are researched and considered a good substitute for traditional packaging. However, there is a need to add a plasticizer in its formulation, logo, the incorporation of a natural stiffening pla, which may be organic, should be investigated by future research. This organic-based material can be used in different food products.

Keywords: organic food; alternative packaging; organic packaging; sustainability; sustainable consumption .

demand and has been exerting great changes in industries. Organic products have in their concept the concern of reducing the impact of their production on the environment, porém, it is known that the composition of traditional packaging, are not mostly sustainable (Boobalan et al., 2016).

In the daily life of the population, disposable plastic materials, such as plastic bags, among others, for packaging for food use are in every corner of society and become important and indispensable items. However, due to the non-biodegradability of most of these plastic products, since they are discarded at random, they will cause environmental pollution being a short- and long-term concern, also known as "white pollution". Therefore, more and more countries are restricting the use of non-biodegradable disposable plastic products (Dai et al., 2019).

In recent years studies on biodegradable and edible films, such as protein, lipid and polysaccharides, are being carried out. In particular, starch has been the focus of a series of investigations because it is biodegradable, renewable, low cost, edible in nature and with wide availability (Cui et al., 2021; Gutiérrez et al., 2015).

Starches have the ability to form transparent and odorless films with good barrier to oxygen, which is extremely beneficial for food preservation. Of the starches, cassava starch stands out, because it is a very common raw material, besides having reduced cost and has wide availability. When compared to other starches, their extraction generates fewer impurities, which improves extraction efficiency (Caetano et al., 2018; Li et al., 2020) Thus, a bibliographic narrative survey was carried out, in which it has the purpose of describing and punctuating biodegradable materials that can be organically based as a packaging alternative for food products.

2 METHODOLOGY

The review was carried out through a narrative bibliographic survey. Narrative review articles are publications with the purpose of describing and discussing the state of the art of a given subject. Given the scope of the theme and the difficulty in establishing a precise research question, the narrative review was used because it allowed an expanded discussion (Lopes et al., 2022; Martinelli et al., 2019).

For the research, a survey of scientific articles in the literature was conducted through online databases: Scopus, Science Direct, Scientific Electronic Library Online (SCIELO), PubMed Central (PMC), national and international sites with reference to organic foods, websites of Brazilian government agencies and Brazilian Agricultural Research Company (Embrapa).

The search of the articles for review was carried out by combining the terms: organic food, organic agriculture, biodegradable material, film and starch-based coating and demand for organic foods. The inclusion criteria defined for the selection of articles were: publications in Portuguese and English, which portrayed the theme related to organic products and biodegradable packaging. There were no specific dates for searching, so archives published and indexed were obtained in the databases between 2005 and 2022,

totaling 166 articles and after reading the manuscripts 94 were excluded for not meeting the purpose of the research, as exemplified in Figure 1.

3 ORGANIC FOOD PRODUCTION

Organic agriculture was driven by movements at the end of the 19th century that opposed traditional food production systems and the environmental damage they brought. Thus generating the beginning of a chain for a healthy diet and a better quality of life (Moraes, 2017).

According to IFOAM (*International Federation of Organic Agriculture Movements*), organic farming is a production system that sustains the health of soils, ecosystems and people. Combining tradition, innovation and science. Its role ranges from production, processing, distribution, to consumption. It thus guarantees the sustainability and health of the ecosystems and organisms that compose it (IFOAM, 2020; Moraes, 2017) .

According to its definition, organic farming is one of the alternatives for the production of a safe food within the standard of food safety, and also of food safety. The international standard in organically produced foods comes from the "*Codex Alimentarius*", originated from the United Nations Food and Agriculture Organization (Efung et al., 2019).

In the literature, several definitions of organic foods are found, among which are presented as: "Foods considered organic are those produced in an environment where agroecological principles are used as the basis of the production process, contemplating the responsible use of soil, water, air and other natural resources" (Boobalan et al., 2016). Under Brazilian legislation, an organic food, *fresh or processed* , is one derived from an organic system of agricultural production or a sustainable extractive process, being not yet harmful to the local ecosystem (BRASIL, 2020).

Currently in the world, there is a growing demand and acceptance for organic products, mainly due to the harms that pesticide residues and chemical fertilizers can cause to the health of the consumer in the food chain, paving the way for awareness of the use of these chemical agents the addition of preservatives during the manufacture of food by companies (Boobalan et al., 2020; F. Silva et al., 2016).

According to *the Research Institute of Organic Agriculture* (RIBL), an independent European non-profit institution, data from the 2018 organic world production from 178 countries show that the sector occupies 71 million hectares (Table 1), about 1.2% of the world's producing areas. The market is led by the United States, both in exports (£2.9 billion), imports (£1.8 billion) and sales (£40 billion), followed by Germany (£10 billion), France (£9 billion), China (£8 billion) in sales (RIBL, 2020).

South America has a total of 8 million hectares, with Brazil touted as the leader of the organic market, but in an extension of land destined for organic agriculture, the country is in third place in the region, followed by Argentina and Uruguay (FIBL, 2020).

The country with the highest number of organic producers is India (835,000), according to Bruno et al. (2019). While in South America the largest number of organic producers is concentrated in Peru

(91,771).

4 LEGISLATION FOR ORGANIC PRODUCTS

The first movements of organic certifications took place in Europe in the 1920s, where the Demeter system of biodynamic organic products was created, whose seal is found to this day (ABD, 2021; Moraes, 2017).

In Brazil, the certification follows the line defined by the Ministry of Agriculture and Livestock (MAPA), being recognized by IFOAM. Its culture and commercialization of organic products began in 2003, however, its regulation occurred only on December 27, 2007 with the publication of decree No. 6,323 (BRASIL, 2020).

Based on Law No. 10,831 of December 23, 2003, all those who intend to market organic products in Brazil must have registration with MAPA, more specifically through the Brazilian Organic Compliance Assessment System (SisOrg). The law established the use of the SisOrg seal for certified products. It is defined, therefore, that certification can be carried out in three ways: by audit, by participatory guarantee system, and by social control in direct sales (BRASIL, 2020).

Abroad, the international body that accredits the certifiers is IFOAM, which is the international federation that brings together the various movements related to organic agriculture.

The labeling in Brazil, specified as organic, is regulated by federal law no. 10,831 of 2003. In 2007, Decree No. 6,323 established the rules of certification and supervision.

Through Article 119 of Annex I of Normative Instruction No. 19 of 2009, MAPA in Brazil established for the domestic market that organic quality information must be stamped on the front of the label, with specific terms for "Organic" or "organic product" for those with 95% or more of organic ingredients; and "product with organic ingredients" for products with 70% to 95% of organic ingredients, among more variants, when with less than 70% of organic ingredients can not have any expression to organic quality (BRASIL, 2020).

The production, processing, labelling and marketing of organic products, for example, in the European Union are governed by Reg. 834 of 2007 and its implementing regulation - Reg.889 of 2008, which covers primary or processed products of plant or animal origin; in the United States, they are governed by the USDA-NOP (*National Organic Program*), section 205 (7 CFR 205), Japan, the legislation governed by *jas* (*Japan Agricultural Standards*), while in China it is governed by the National Regulation of the Republic of China for organic products (Ecocert, 2020).

5 CONSUMER PERCEPTION

Since the growing demand for organic crops in the world, through the sale of large retailers, as well as creation of its own brand for organic, at least two barriers have been removed for their consumption: high price and low availability. The consumer reacted positively to the spread of organic products. Its

characteristics meet the needs of more naturalness and sustainability, demonstrating more respect for animal welfare, and giving importance to human and cultural values (Carfora et al., 2019).

According to literature, it is unanimous to verify the main perceptions of consumers regarding organic foods. The main drivers of buying and consumption are due to the fact that they are said to be healthy and less harmful to the environment than conventional foods and promote support to the local economy and the community (Dorce et al., 2021).

Trust between the consumer and food is a factor that can be added as a buying motivator. The organic product is made through process certification. Trust in the certification system is critical to the integrity of organics. Thus, trust becomes loyalty to the brand, so the consumer has a greater willingness to pay for the product (Carfora et al., 2019; Castaldo et al., 2009; Menozzi et al., 2015; Pivato et al., 2012).

Koklic et al. (2019), through their study, pointed out areas that can directly shape the intention to purchase organic products: attitudes towards the consumption of organic foods, past consumption and personal norms. That is, the consumer's intention to buy organic food becomes stronger with more positive attitudes, an increase in the frequency of organic food consumption in the past and stronger personal standards. In addition to the study of past behavior being an important predictor of future actions and intentions, directly affecting the norms and personal attitudes regarding the purchase of organic. Moral influences influence the intentions of buying, for example, environmental concern exerts an effect via moral or personal norm.

Lamonaca et al. (2022) in their research, cited other characteristics as intention to purchase organic products, such as nutritional information on the packaging, sympathy through a label with carbon footprint and organic and quality labels.

6 ALTERNATIVE PACKAGING FOR ORGANIC AND CONVENTIONAL FOODS

It is a fact that packaging can influence the impression of consumer taste, generating emotional responses and predisposing the same to buy the product. It presents itself as an integral part of a system. In the literature, three functions for traditional packaging are covered: (1) containment and handling, (2) protection and preservation and (3) information and communication (Becker et al., 2011; van Herpen et al., 2016). Traditionally, plastics, papers, glass and metal containers have been used to pack food. However, when performing these functions generates a cost, both monetary of the packaging material itself and the environmental load that it causes (Amin et al., 2021; Roper et al., 2013).

According to the IFOAM principle, the packaging of organic products should have minimal impacts on food or the environment. As a recommendation, these should be packed in reusable, recyclable, recycled or biodegradable packaging when possible (IFOAM, 2009).

Retailers' preference is common in marketing organic products in plastic bags, so that they can be clearly distinguished from conventionally grown ones and ensure that the consumer buys the product at the correct price. In addition, some supermarkets also prefer plastic bags to ensure the organic integrity of the

product. The organic claim is, in fact, about how the product is grown, however, supermarkets are responsible for maintaining the separation between organic and conventional. Violation of regulations in place to protect this problem can result in severe fines to the retailer (Dole, 2020).

However, in a study conducted in Europe, researchers concluded that removing the primary packaging (plastic packaging) of organic fruits and vegetables would be a promising intervention in attempts to increase sales of organic vegetables, since it would fit better with the environmental image of the product (Van Herpen et al., 2016).

Alternatively, great advances in the packaging area have come since its creation in the 18th century, among them are biodegradable packaging, which can be active and intelligent.

In the literature, several studies developing and applying different types of biodegradable packaging can be found. Produced from renewable sources, such as starch, protein, lipids and developed from agro-industrial waste, as unused parts of fruits and vegetables, which have bioactive compounds and that can provide interaction with the packaged product, bringing additional advantages in food preservation (Miglioranza et al., 2021)

Biodegradable films arise due to environmental concerns and the need to protect consumer health. Through biomaterials (natural materials) of food quality, these packages can extend the life of the product acting as a selective barrier against moisture and oxygen. They reduce lipid oxidation by controlling oxygen transmission and synthesis of volatile compounds, factors responsible for the production of unwanted odors and flavors (Amin et al., 2021; Enujiugha et al., 2018).

To control food quality and improve food safety standards, i.e. expand the functionality of biodegradable packaging, bioactive and functional substances such as antimicrobials, antioxidants, vitamins, flavonoids, etc. can be incorporated. Thus, these materials can be used as carriers of bioactive compounds, increasing the nutritional value of food products or to extend the shelf life of the packaged product (Lu et al., 2019; Salgado et al., 2015).

To this type of packaging, Glicerine et al. (2021), conceptualize as active packaging, where there is a system in which the packaging, product and environment actively interact prolonging the shelf life and / or increasing the safety and sensory properties of food products during storage.

Miglioranza et al. (2021), compared the application of a biodegradable film, based on grape seed flour extract and PVA (Polyvinyl alcohol), as a packaging for dehydrated fruits, using raisins of the crimson variety without seeds, with conventional poly film (ethylene) packaging, obtaining higher phenolic contents and antioxidant activity for raisins packed with biodegradable film after 182 days of storage.

Motta et al. (2020) developed films based on non-ionic, cationic and anionic starches incorporated with the cationic surfactant LAE, aiming to provide an alternative to extend the shelf life of food products.

Nakashima et al. (2016), studied the development of collagen-based films with concentrations of clay, plasticizer and essential oil of clove on the characteristics of color, opacity, tensile strength, solubility, water vapor permeability and film thickness. Concluding that collagen films obtained good mechanical

properties, adequate visual appearance and easy handling, as well as low permeability to water vapor and solubility in water. The addition of essential oil was effective in the structure of the film, improving the appearance and handling.

Costa et al. (2020) developed and characterized edible films produced by polymerblends, composed of natural polysaccharides, aiming at their use as edible coatings for fruits. Polymeric films from Quitosana, Pectina, Cassava Starch, Chiscan + Pectina, Chitosana + Cassava Starch, Pectina + Cassava Starch and Chitosana + Pectina + Cassava Starch were developed.

7 STARCH-BASED PACKAGING MATERIALS

Renewable raw materials such as polysaccharides (starch, pectin, alginate, carboxymethylcellulose and chitosan), proteins (wheat gluten, whey protein isolate, caseinate and soy protein) and lipids (waxes and fatty acids) or a combination of these have been studied to prepare biodegradable edible films and coating. However, several studies report that polysaccharides from different sources are promising materials for the preparation of films and coatings with bespoke behavior, considering that they are natural, non-toxic and biodegradable polymers (Enujiugha et al., 2018; Guimarães et al., 2020; Schmid et al., 2018).

Starch has been reported as a cheap material, besides having excellent film forming capacity (Hassan et al., 2018; Kang et al., 2020).

It is a polymer that occurs widely in plants such as potatoes, corn, rice and cassava. In all these plants, starch is produced in the form of granules, which vary in size and composition depending on the plant. In general it is formed by two types of glucose polymers: amylose and amylopectin, with different structures and functionality. The proportion between amylose and amylopectin is variable with the botanical source, conferring specific characteristics to the starch paste. In food use, both fractions are readily hydrolyzed in acetal bonding by enzymes (Chandra et al., 1998).

Starch films are one of the most effective bio-based packaging materials in terms of performance, adaptability, processability and cost. Through the composition of starch, amylose and amylopectin, effects on the formation and properties of film occur. The linear structure of amylose promotes high-level hydrogen, through the bond between its molecules forms a crystalline structure. Amylose chains are relatively long linear chains, this allows a better interaction between polymer chains due to better approximation or accommodation of chains. While amylopectin chains result in films with weak and brittle characteristics due to intermolecular bonds disadvantaged by the existence of short chains and branches (Jha, 2020; Suh et al., 2020).

However, starch films have some limitations, such as strong hydrophilic behavior, which makes high sensitivity contact to moisture and low mechanical properties (Jha, 2020).

Aiming to serve the consumer in the search for improvement of quality, safety and the extension of shelf life of the product, biodegradable materials based on starch has been studied for the food industry as packaging materials (Table 2).

Several studies have been conducted to analyze the properties of starch films produced from different botanical sources, such as corn, wheat, cassava, yams and potatoes (Cui et al., 2021; Galdeano et al., 2009).

Among the starches of various botanical sources, cassava starch stands out for being an excellent raw material for the production of biodegradable materials and is useful for industrial applications. When compared to other starches, it is easily extracted, resulting in a white product without the need to use bleaching agents. Most of the granules are rounded, with the flat surface on one side and a cavity on the other. According to the variety and the harvest period exhibit great variation in their size (5 to 40 μm) (Chollakup et al., 2020; Dai et al., 2019).

In addition to being biodegradable, films and coatings produced from cassava starch are odorless, tasteless, colorless and non-toxic. Furthermore, the films have good mold resistance and permeability, are flexible and extensible materials of homogeneous and smooth surfaces. The production of films from the starch is based on its gelatinization, which occurs above and 70°C , followed by cooling (Cortés-Rodríguez et al., 2020; Dai et al., 2019; Lim et al., 2020; Luchese et al., 2021; Suh et al., 2020). However, pure starch films have more fragile mechanical properties, consequently it is necessary to use additives, such as plasticizers, to improve their characteristics (Chen et al., 2019).

Plasticizers are additives necessary for the manufacture of films, such as starches, because films that comprise only starch are rigid, brittle and inflexible. Generally glycerol and sorbitol are used as plasticizers. These improve the flexibility of starch film by reducing the hydrogen bond between macromolecules and increasing intermolecular spacing between chains (Lim et al., 2020).

Although hydrophilic compounds, such as polyols (glycerol and sorbitol), are commonly used in starch films, some sugars, amino acids, carbamides and fatty acids can also be used (Maniglia et al., 2019). In the literature can be found studies with the development of starch-based films and different plasticizers, as exemplified in Table 2.

8 NATURAL PLASTICIZER TRENDS

As the alternative packaging industry grows, the proportion of demand for new plasticizers also increases. Since the use of phthalates (the most used nowadays), has been questioned due to toxicity problems, which are related to the migration of these compounds. Therefore, alternatives to traditional plasticizers are sought, which come from biological sources and that meet requirements such as low toxicity, low migration and biodegradability (Liu et al., 2020; Rocha, 2019; Vieira et al., 2011).

In the search for new biodegradable packages of natural and organic source, the option of sugars, honey and lipids can be studied.

Sugar is a generic term for edible candied carbohydrates, mainly sucrose, lactose and fructose. It is produced by all chlorophyll vegetables, through photosynthesis. Of the different types of sugar, brown, organic or not, stands out, once produced from sugarcane, does not go through any kind of refinement

process, so there is no chemical additive in its composition. Thus maintaining its nutritional quality, vitamins and minerals (Bettani et al., 2014).

The use of sucrose as a plasticizer is recommended in cassava starch films and may increase elongation at rupture, however crystallinity has been observed during storage, changing the material from malleable to brittle (Veiga-Santos et al., 2007). For example, Santos (2004), observed crystallization after 10 days of storage in films based on cassava starch and sucrose as plasticizer. It is then indicated to use a wetting as propylene glycol to avoid crystallization of the films. If sucrose is added to the filmogenic solution, all granules should be completely homogenized so that there are no crystallization nuclei, affecting the final structure of the eriais mat along the stocking.

Honey, considered a natural product, is composed predominantly of sugars such as fructose and glucose, in addition to enzymes, minerals, organic acids, hydrocarbons, amino acids, B vitamins, vitamins (C, D and E), antioxidants, water and substances that give it aroma and flavor, being a replacing resource of sugars (Garcia et al., 2018; M. G. C. da Silva et al., 2018). As for the possibility of using organic honey, it would qualify as a product free from undesirable chemical and biological contamination. In literature, several studies addressing antioxidant properties (Beiranvand et al., 2020; González-Ceballos et al., 2020) and honey antimicrobial (Alvarez-Suarez et al., 2010; Estevinho et al., 2008).

Santagata et al. (2018), for example, used pectin-honey coating in dehydrated fruits (apple, melon, mango and pineapple) to explore the antimicrobial activity of mel. However, there are still no studies as a possible contribution to plasticization.

Lipids are compounds that originate from natural sources such as animals, insects and plants, the diversity of lipid functional groups is composed of phospholipids, phosphatides, mono, di and triglycerides, terpenes, cerebrosides, fatty alcohol and fatty acids. In films and coatings lipids can provide some characteristics such as brightness, minimizes moisture loss and alters packaging complexity (Mohamed et al., 2020). Biological-based plasticizers can be obtained from plant or animal sources, in this set are oils obtained from agricultural plant sources, by-products of them, or even from residues. Vegetable oils, as well as coconut oil, appear in this group as highly available, low-cost, non-toxic alternatives from renewable and non-volatile sources (Liu et al., 2020; Rocha, 2019).

Coconut oil is useful in several sectors, such as food, pharmaceutical, cosmetic and also in biofuels, since there is the presence of methyl esters present in the oil. In packaging research, it is evaluated as antioxidant and antimicrobial, since it contains polyphenols in its composition, and can inhibit oxidation. In addition to having a free fatty acid content of less than 0.1%, fatty acids with a normal distribution of the carbon chain and a reasonable composition of saturated and unsaturated fatty acids. The addition of coconut oil can reduce water permeability in films and food coating (Fangfang et al., 2020; Neto et al., 2020). As for the possibility of this also having influence on the mechanical characteristics of films has not been reported.

It is important to highlight that a good plasticizer usually provides high plasticization in low concentration and promotes rapid diffusion and interaction; while its efficiency is defined as the amount of plasticizer required to produce the desired properties of the film. Therefore, to optimize the properties of final use of the materials, it is important to study the effect of plasticizer concentration on mechanical resistance. (Versino et al., 2019).

9 FINAL CONSIDERATIONS

This article surveyed the concept and increased demand for organic foods, addressing traditional packaging and alternatives for food products. Being able to develop biodegradable organic materials closing the cycle of the chain of food and organic products.

Many studies show increased consumer awareness of products that meet environmental protection, health and food safety. Given environmental protection, biodegradable packaging based on natural resources has received considerable attention.

Using an organic packaging has the possibility of using an organic starch as raw material for its production. This is a base of low cost, besides abundant, biodegradable and even edible. And emphasizing that all the inputs used in the production of this packaging are of organic origin, it makes the concept of this packaging more challenging.

Future research is necessary, both bibliographical and experimental, where the objective is to study the possibility of incorporating natural and organic plasticizers into a filmogenic solution in order to obtain organic and biodegradable base materials. Going according to the ideology of organic foods and this material can be used for other products.

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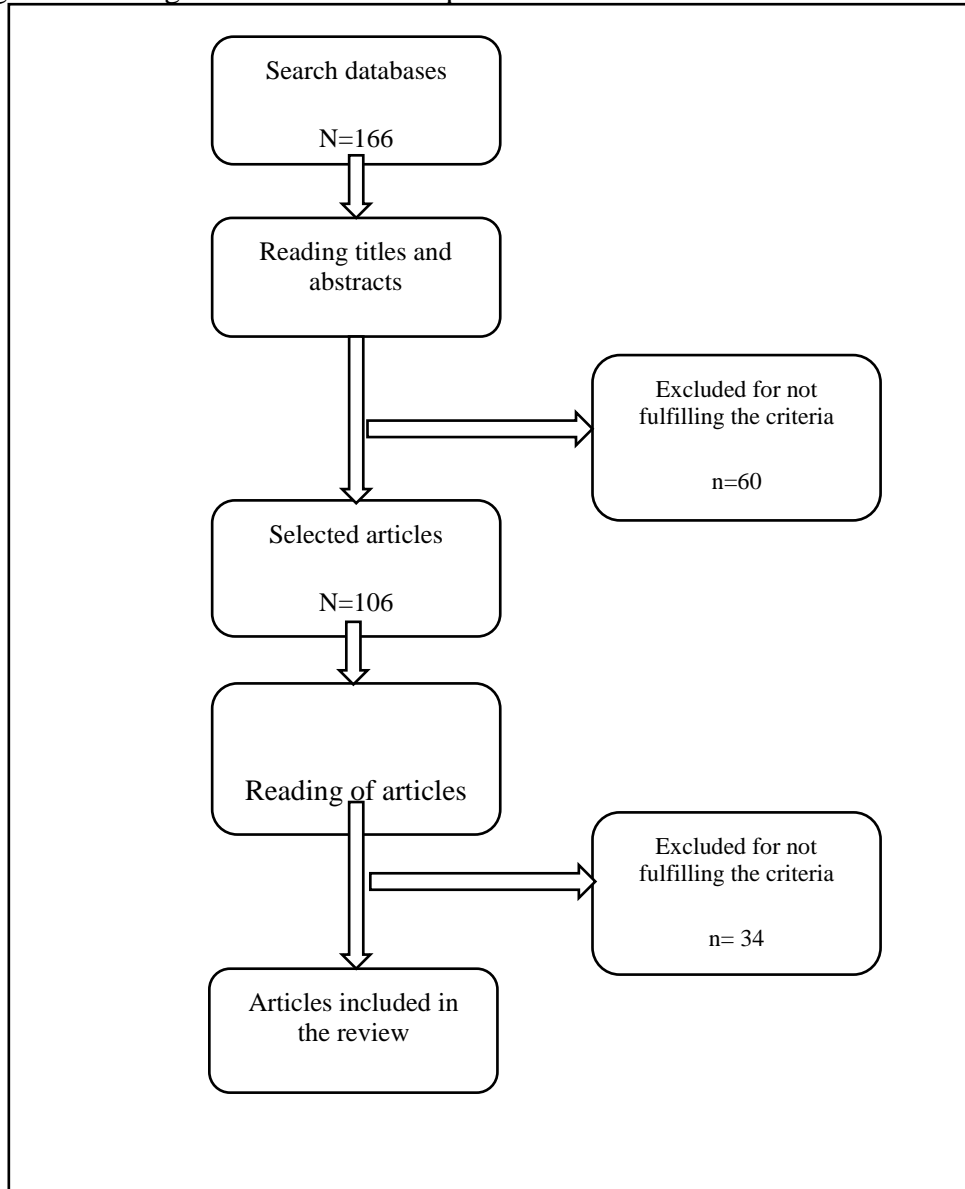
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Figure 1: Fluxogram of the inclusion process of the articles in the narrative review



Source: Authors

Table 1: Area in the world by organic regions

Country	Year	Organic area (agricultural land) [ha]	Percentage of organic area in total agricultural land [%]
Africa	2018	1'984'132.28	0,18
Asia	2018	6'537'225.85	0,41
EFTA*	2018	233'637.14	5,96
EU	2018	13'790'384.08	7,71
Europe	2018	15'635'504.61	3,12
Latin America	2018	8'008'580.69	1,06
North America	2018	3'335'001.81	0,82
Oceania	2018	35'999'373.49	8,57
World	2018	71'494'738.75	

*EFTA: European Free Trade Association (Switzerland, Norway, Iceland and Liechtenstein)

Source: FiBL, 2020

Table 2: Development of starch-based food packaging with different plasticizers

Characteristic	Developed material	Plasticizer	Applied food	Reference
Shelf life extension	Coat based on cassava starch and chitosan with tamarind seed extract	Glycerol	Guava	(Rodrigues et al., 2020)
Shelf Life Extension Antioxidant Property	Edible film based on cassava starch with <i>Lactobacillus plantarum</i> , <i>Pencococcus pentosaceus</i> and carboxymethylcellulose sodic	Glycerol	Banana	(Li et al., 2020)
Biodegradable	Biodegradable foam based on cassava starch incorporated with grape stem	Glycerol	English cake	(Engel et al., 2019)
Antioxidant and antimicrobial property	Film based on starch, citrus pectin and <i>Acca sellowiana</i> residue	Glycerol	Apple	(Sganzerla et al., 2020)
Shelf life extension	Film based on arrowroot and yota-carrageenan starch	Glycerol	Cherry tomato	(Abdillah and Charles 2021)
Biodegradable Use of industrial waste /natural sources and	Cassava starch-based film with orange juice residues	Glycerol	N/A	(Leites et al., 2021)
Shelf life extension	Film based on cassava starch, whey protein and beeswax	Glycerol	N/A	(Cortés-Rodríguez et al., 2020)
Active agricultural films for controlled release of fertilizer	Cassava starch and bagasse materials containing urea	Glycerol and Urea	N/A	(Versino et al., 2019)
Antioxidant and antimicrobial property	Cassava starch and whey protein mixing films containing rambutan bark extract and cinnamon oil	Glycerol	Salami	(Chollakup et al., 2020)



Plasticizing study Biodegradable	Cassava starch film	Glycerol and Sorbitol	N/A	(Lim et al., 2020)
Plasticizing study	Oatstarch Films	Glycerol, Sorbitol, Urea and Sucrose	N/A	(Galdeano et al., 2009)
Biodegradable	Cassava starch and gelatin film	Inverted sugar and sucrose	N/A	(Veiga-Santos et al., 2007)

*N/A: Not Applied

Source: Authors

CHAPTER 91

The management by competencies as a differential in the professional acting

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ABSTRACT

The main objective of this work is to describe qualitatively the actions indicated to implementing the management by competence, also discussing its combination with the management by performance. It also looks forward to observing the management by competence relation with the process of technical and behavioral development of professionals into the

institutional guidelines, identifying what are the necessary competencies and career anchors for the organization to reach advantage in the labor market, and discussing that the executive secretary has a relevant role in this implementation process. The analysis of the results points mainly to the effective participation of the executive secretariat professional in the application of the model, as well as the relation of the career anchors with the competencies demanded by the organizations.

Keywords: Management by competencies. Executive secretariat. Professional anchors. Technology

1 INTRODUCTION

Competency management is related to the concern with the performance of professionals aimed at achieving the company's objectives, with a bias towards the selection, retention and performance of employees. Carbon et. al., (2009) point out that organizations have used this model to achieve their organizational goals. On the other hand, Strauhs (2012) emphasizes that this model promotes the development of the necessary skills for the position or function that the professional will occupy. In turn, Carbone (2009) indicates that if actions with this purpose are not implemented, the tendency will be to increase the existing gaps. This is a key element that should not be restricted to specific units on the respective subject.

In this way, considering the hierarchy established in the units, the leaders of the area can exercise this management of competences with the professionals who are under their supervision, and the steps involved can be rethought and redirected considering the differences and challenges of each sector, taking into account since each one of them has its specificities, and they need actions and decisions according to their administrative, business and managerial demands.

The new technologies must be included in the action plan developed by the area's management, seeking new knowledge that can introduce professional performances appropriate to the complexity of the environment and the organization's decision levels. In addition, it is necessary to assess which skills should be required of professionals in order to understand how they contribute to the organization through their experience and knowledge. In this perspective, it is important to define what type of evaluation will be demanded from the employee, because, if it is for performance, it is the work itself, according to the results achieved. On the other hand, if it is by competences, the organization will be able to measure with greater

particularity the individual competences inherent to the position or function that the professional will occupy.

Brandão and Guimarães (2001) present distinctions and particularities between performance management and competence management, observing situations with the mixture between these two elements, performance and competences. This combination can present a competitive advantage for the organization by indicating the core competencies that can provide a high level of company capacity to differentiate itself in the business world. Management based on the competencies of individuals contributes to the development of attributions, promoting an increase in productivity and performance. Carbon et. al., (2009) draws attention to the importance of objectivity and clarity in the description of the survey of the skills used, in such a way as to avoid mistaken indications by employees that do not represent their real performance capacity. In this direction, it is understood that when delegating activities according to the appropriate competencies for each function or position, the probability of achieving organizational results is evident.

In this way, given the peculiarity of each individual who plays a certain role, this sum of management by performance and management by competence not only helps to monitor people's results in relation to work, but also to boost and retain them. in the company, as catalysts of excellent results . In this bias, it is worth emphasizing that the manager has the fundamental attribution to identify the competences of his team members, mainly referring to technical and practical knowledge, skills with innovative attitudes. So, it is considered in this discussion that the executive secretary with his multiple competences, can be one of the collaborators of the process, and a differential in the organization.

The process of analyzing the professional's competences must be planned, because, otherwise, it may cause inconvenience due to him taking on positions or functions contrary to his ability and technical, cognitive, among others, which may impair the progress of activities, and on the other hand, difficult to adjust. However, it is important that the organization provides a favorable environment for the performance of skills, and understands the differences in positions among its employees, especially in relation to customs, cultures and ideologies, in such a way as to understand that divergences of ideas are healthy. for the benefit of the organization, it is more necessary to monitor and promote actions that can provide integration between them. However, it is necessary to verify if the professionals' goals are aligned with the company's goals, aiming to guide them in the ideal direction if they are in disharmony with the institutional strategic guideline.

In this scenario, Silva (2010) indicates that the characteristics of the executive secretary regarding negotiation and interpersonal relationships minimize conflicts and generate harmony between managers and professionals in the organization. The author emphasizes that the ability to innovate, transform, act on changes and support the decision-making process of this professional is part of the organizational context. Otherwise Silva (2021, p.3130), indicates the need for the secretary to be “(...) connective, positioning himself and generating collective results, solving problems and not only identifying necessary skills, but

tuning them”. Thus, this professional is considered a differential in the process of management by competences, with the necessary conditions to develop activities that require negotiation, communication, integration, flexibility, innovation and organization.

On the other hand, the assessment of which skills are necessary for the actions are essential for excellence in the performance of activities, and in this context, this professional passes through several sectors that demand the respective actions, which need the support of an integrating element. with the other professionals. Lessa; Shell (2015, p.134) indicate that the executive secretary currently holds relevant positions in companies, such as: “(...) assistance to the executive in decision-making and service approvals, improvements in the overall performance of the organization, modernization of systems and information flows.” These authors point out management tools that can be used by the secretarial professional in order to identify problems and promote solutions in such a way as to support the executive in decision making. One of them is the *Deming Cycle* , PDCA - planning, development, coordination, evaluation, which is indirectly indicated in Figure 1, which presents the scheme of the competency management model, from another perspective, referring to the process to be implemented. .

Therefore, it is stated that the executive secretary can carry out activities that are in his/her profile of advisor, manager, consultant, entrepreneur, accompanying and supporting the implementation of this model with actions to achieve organizational goals. With this perspective, it is worth noting that the middle area, generally, the radius of action of this professional, has the same degree of relevance, importance and demand of the final areas, since they are responsible for providing the necessary conditions for the performance of the end activities. of organizations.

Although each professional is unique in their skills, it is important to note that the actions and development of work and activities must lead to a single direction, achieving the organization's objectives.

2 EXECUTIVE SECRETARY, ORGANIZATIONAL AND PROFESSIONAL PERFORMANCE STRATEGY

The competencies identified and valued according to each position or function cannot remain static, it is necessary to reformulate and with that look for others that can feed back the organizational competencies. Mussak (2010) characterizes the need to understand which areas are adherent to the person. On the other hand, it emphasizes the aspects of the environment and value to be present in the actions in such a way that the cycle is completed.

In this model, competency management follows a direction with a view to mapping, evaluating and developing the tripod of competencies (individual, collective, organizational), developing a mapping with the survey of the needs of the sectors of the organization, so that they can develop and train the professionals and teams in order to achieve their general and specific results.

Silva (2009) reinforces that people management is a central part of an organization, but faces challenges such as competency management discussed in this chapter. The central cell is the professional

in the face of changes and transformations. In this scenario, people management drives “(...) companies to invest in their intellectual capital through strategies that provide satisfaction to their employees in order to encourage individuals to add value to the organization.” (SILVA, 2009, p.173)

In view of this, a reinterpretation of the Competency Model was produced in which Carbone et. al., (2009) explains that it is about the performance of individual and personal skills in such a way as to create and maintain organizational skills in order to achieve organizational goals.

Figure 1. Reinterpretation of the Competency-Based Management Model



ANALYSIS OF STEPS

Source: Guimarães et. al., (2001) apud CARBONE, et. al., (2009) with adaptations.

Figure 1 - demonstrates the essential steps for a Competency Management model accompanied by actions and strategic perspectives indicated by the organization on its institutional guideline. The re-reading of the model was based on Guimarães et. al., (2001) *apud* Carbone, et. al., (2009) but with the inclusion of technological and innovation aspects. It is a dynamic and flexible scheme, which primarily looks at the organizational strategy plan, including the organizational mission, vision, goals and objectives. From this objective, it analyzes the competences demanded by the organization, inserting the technological and innovative ones, and with that the personal, technical, technological and individual competences of the collaborators are raised. Thus, it is possible to carry out the construction and integration of internal and external, individual, collective and organizational competencies shown in Figure 2 below.

Figure 2 - Actions for Internal and External Competencies



Source: Own authorship.

Therefore, it is possible to set goals, thinking about innovations and performance indicators. In this perspective, the current competencies are found, as well as the existing gaps related to the lack of competencies that are demanded by the organization, but are not developed. In this final phase, evaluation, monitoring, adjustments are applied to correct possible gaps, analytically returning to the initial stage, passing through all other stages, if necessary.

In view of the diagnosis of the gaps found, the action plan helps to identify internal and external competencies through selection and recruitment in order to minimize the deficit found in the mapping carried out. In this perspective, Carbone et. al., (2009) in which he indicates that the purpose of mapping is to identify those gaps that prevent the institutional strategy from being implemented. Thus, it is possible to produce action plans and establish goals, innovations and performance indicators that will promote the reduction of errors. Strategic integration with management takes place with the alignment of individual, collective and organizational competencies.

After completing all the steps, it is important to assess whether the process was developed without failures or whether there is a need for adjustments in relation to the results achieved and the desired ones, in order to correct eventual failures in the route. The implementation of a competency-based management model requires complex and difficult steps to execute, with challenges that profoundly impact the entire chain of people in the company, even if senior management provides the necessary means and support at all stages of implementation.

Competency management requires a robust and in-depth analysis with the support of management tools, for example, PDCA of the competencies demanded by the organization cited by many authors in the area. In this idea, the area of people management, planning and logistics plays an important role in this competency-based management model, as it helps to facilitate the indication of the organizational strategy together with the model implementation team.

In any case, the participation of senior management is essential for the deliberation of the appropriate models and the resources or means necessary for processing and executing the plan. In this way, it is possible to get involved in the other hierarchical levels (VIEIRA, 2003). After all, resistance may arise due to the fears of employees, and they need institutional support and incentives from managers for the full development of the aforementioned competency management plan aligned with performance management.

2. 1 IMPLEMENTATION OF MANAGEMENT BY COMPETENCES WITH THE SUPPORT OF THE SECRETARY.

The implementation of the competency-based management model can be carried out with the support and participation of the executive secretary based on their technical and experiential knowledge of the company in which they operate. First, through the understanding of the referred management, the knowledge acquired in the academic world, and through research on the subject. Second, because the

professional has access to all hierarchical levels and in the company's units, as stated by Coutinho (2018), "(...) the executive secretariat manages to cover all sectors of the organization, knowing their positive and negative points, contributions and deficiencies, which makes it able to make the connection between them when necessary (...)"

As this type of management is based on mapping, assessment, development and monitoring, it is possible for the secretary to contribute to the survey of the skills that the organization needs to monitor the market, as well as to collaborate in the development of the process of selection and recruitment of professionals that can contribute to the goals of organizations. In addition, it can verify whether the selected professionals were assigned to the units based on their skills, including suggesting training and development necessary for the improvement of each one of them.

In this way, as a transforming agent it causes specific changes in the environment, in the sense of moving the actions of individuals towards the implementation of the management model. In turn, during the process, you will come across stable, reactive, proactive, creative, exploratory behaviors, which require relational and social skills to consider and agree on conflicts when necessary. Under such a scenario, each level, unit, professional has its role in the respective implementation, as this process may represent a threat to professionals who already work in the organization, and those who will join can become challenging to face unexpected situations, in this aspect the secretary has ability to face similar challenges.

According to Takeuchi and Nonaka (2008, p.122) Moving away from known habits can seem very risky." On the other hand, the authors call attention to tacit knowledge, which in turn are part of professional competences, which are complex to identify, considering that they are subjective, and permeated by customs, beliefs, mental maps, among others, which are included the cognitive dimension of the person. In this perspective, it is worth noting that the executive secretary and the managers also influence the implementation process, and therefore they must rethink their behaviors, attitudes and interpersonal relationships. Considering that learning and knowledge are important to contribute to the development of activities and the achievement of the objectives proposed by the organization, understanding the performance of each element of this competency-based management model process is necessary to take advantage of and direct the role of each of them.

Therefore, in table 1, below, the steps are shown, as well as the performance of the implementation team, the executive secretary, and senior management, in this complex process that seeks competitive advantage by inserting the culture of innovation with broad approaches, aiming to ensure the maintenance of the company in the face of the dynamic and unstable market that imposes on organizations the promotion of actions that keep reviewing their methods and generating organizational competences.

Table 1 – Performance in the Competency-Based Management Model to be implemented.

Phases	Implementation Team	Executive Secretary	High administration
1	Describe the strategies based on the institutional guideline.	Share your view on the best strategies.	Indicate the institutional guideline Provide unrestricted resources for implementation.
two	Provide methods for identifying tacit, explicit, attitudinal, and technological skills. Catalog and analyze the types of competencies identified. Prepare documentation of results.	Support the application of methods. Sensitize employees to participate. Apply the practice of interpersonal relationships. Communicate Actions Review – the documentation	Provide unrestricted resources for the implementation of the Competency Management Model.
3	Manage internal and external information and knowledge. (Stakeholders) Promote training and development with innovative practices. Prepare selection and recruitment. Align individual and organizational competencies.	Share information and knowledge. Present insights, ideas, and observations. Indicate actions to improve skills.	Provide unrestricted resources for the implementation of the Competency Management Model.
4	Prepare the action plan Promote meetings with the units to discuss the matter.	Plan meetings with units.	Decide on the plan, goals, and performance indicators.
5	Evaluate the results of the plan. Review and adjust the competency mapping process. Indicate new procedures and routines.	Collaborate in the adjustment of the process. Disseminate the new procedures and routines	Decide on the analysis of the evaluation result.

Source: own authorship

In this perspective, an important issue is inserted in competencies, which it is believed can be added to competency management. These are the career anchors that were discussed by Schein (1978, 1996), based on the study he carried out with some students, observing that as the individual goes through evolutionary career phases, he gets to know himself better, being able to identify clearly what he really does with mastery and satisfaction. Considering that the author indicates skills, values, attitudes in this process, it is possible to insert these dimensions in the work of training people to improve management by competences. For, mapping has the role of providing moments with employees in order to use management tools that can contribute to this action, such as: *design thinking*, SWOT matrix, among other management tools.

From the perspective of Schein (1996), with the addition mentioned by him, of the anchors, service and dedication to a cause, pure challenge and lifestyle, it can be inferred that from the recognition of these elements, it is possible for the individual to make choices career successes. In this bias, the process of mapping competencies can follow this conception of which career anchors each professional recognizes to have.

Therefore, understanding each one of them, their meaning and context, is to be able to understand which ones can provide their well-being and what is required in their function or activity, and contribute to

the decision on the adequate capacity of the individual in the units, projects or activities that need to be developed, executed, produced. The delegation of competence combined with the professional's vision of what he likes to develop can guarantee the retention of knowledge and allow the collaboration of intellectual capital to innovate on the company's processes and business.

in **Chart 2** , which shows that professional anchors are linked to social, technical, individual and organizational skills, as creativity, innovation, complex activities, interpersonal and group relationships, concern for the neighbors and society, as well as functional stability.

In this perspective, each career anchor indicated by Schein (1978,1996) is presented, based on the respective author, and on the perception of the author of this chapter, in which it can be observed that for each anchor there are several competencies related and inserted both in the organizational context and in the individual and personal context of the employee, as well as the type of profession that is linked to their meanings.

Table 2 – Professional Anchors, meanings and perception.

PROFESSIONAL ANCHORS	MEANING	BECAUSE?	AUTHOR'S PERCEPTION OF THIS CHAPTER
Autonomy Independence	Maintain freedom for professional life choices.	Possibility of flexibility to carry out situations according to perception and will.	Freelance and creative professionals
Safety Stability	Priority in financial security and job stability	They look for jobs with job stability that denote solidity.	Public agent,
Competence technical/functional	Stimulus and motivation for the specific activity	It is an expert in the activities through its competencies in specific areas.	Consultant. Advisor
Competence general management	Analytical capacity, interpersonal and group relationships, emotional balance.	They are part of the decision-making process, with multiple functions. They like to manage and know all areas of the company.	Strategic and tactical manager. Executive Secretary
Creativity entrepreneur	Can create profitable businesses, services, and products	Are persistent in ideas	Entrepreneur. Innovation/Technology Professional
Service and dedication to a cause.	Activities that contribute to others and society. They work in organizations that have respect for the values and can exert influence	They are collaborative and have social responsibility.	Third Sector Professional, NGO OSCIP
pure challenge	They work in search of obstacles to be solved.	They like to deal with challenges, and with each problem solved they look for new challenges to overcome.	Professionals whose activities have a high level of complexity. Consultant
Lifestyle	They work in activities that can be reconciled with their personal and family tasks.	They seek balance in order to reconcile their activities with their individual and family needs	Professionals who do not put work above their personal and family needs.

Source: Adapted from Schein (1978, 1996).

Considering the dimensions of competencies found in Schein's (1978,1996) career anchors, one more anchor is included, the technological one, which can be understood as acting in digital activities and technological solutions. It is also inferred that this technological anchor can be considered as the activities related to the actions of information and knowledge management, as well as information technology, in which the professional will be able to recognize his performance in the systematization of processes, innovation of the business with digital transformation and disruption, artificial intelligence, among others. In fact, these perceptions are still being studied and researched by this author with a bias towards professional competences based on the reflection of the anchors presented by Schein (1978, 1996).

The essence of this thinking is anchored in innovation as a differentiating element in current organizations, given that the technological revolution promotes complexity, challenging goals and, at the same time, administrative and business modernization on a large scale. In this way, we dare to discuss this anchor that is currently demanded and indispensable by all companies, in view of the digital world that is increasingly accelerated due to the demands driven by the competitive market and require complex skills in the universe of disruption and digital transformation, which are aimed at actions that depend on people's approach and technological feasibility.

Thus, it is worth noting that *software* , programs, platforms are part of the strategies and solutions of organizations to achieve their goals with market competitiveness. In this way, innovation is considered to be present in this space, which is built through the creativity and entrepreneurship of its employees. On the other hand, it is worth mentioning that ABES (2018) *apud* Parada ; Golin (2018), reports the high number of software developed in the country. Given that, Stop; Golin (2018) emphasize that from this perspective, innovations increase, and the trend is the evolution of the information technology market. Okano et. al., (2019) in turn notes that in the face of these changes, processes will be modified, and consequently new actions and models will be needed, as well as investment flows based on market and customer demands. In this bias, the digital element should be inserted into the company's internal perception related to all business and service approaches.

Companies and people are increasingly dependent on the support of digital resources, considering that it significantly reduces the time and costs involved for some activities, such as: meetings through videoconferences, communication by corporate digital groups, among others. In these scenarios, technological tools are necessary in the management processes, in any direction. One example is competency mapping, which sometimes requires *software* capable of storing large data to monitor indicators. So, having a qualified professional or knowledgeable about these technologies, and hiring an information technology development area, who can understand what the management area needs to be able to develop a system for this activity considered essential for the company is essential.

In the evaluation process, the respective professional anchors are very important to identify the professional's list of competencies, but with guidance on what is really important to perform and develop. Thus, it is possible to adjust the number of people according to the positions or functions that require

activities that employees do not recognize themselves doing. These are situations that need to be analyzed, as well as procedures, processes, or competencies that were not properly planned or used.

On the other hand, it is the opportunity to evaluate, identify and record tacit knowledge, which has not been recorded and can contribute to the organization, as it is often not used because the lack of knowledge of this domain is not documented, as well as the professional's ability to other areas that have not yet been tried or performed. Strauhs (2012) emphasizes that generating knowledge increases productivity and efficiency in companies. In addition to observing that competency management combined with knowledge management by some companies, confirmed better performance in performance.

In this scenario, the importance of the competence mapping process is highlighted, from the performance evaluation combined with competence evaluation, considering that its absence may cause intangible damages to the company. Thus, Chiavenato's (2009, p. 247-248) understanding of the advantages of performance evaluation stands out, which identifies "(...) problems of supervision of personnel, integration, from the employee to the organization or to the position he occupies. , dissonances, wastage of employees with higher potential than what is required by the position, motivation, etc."

Thus, it is understood, when an employee spends more time to perform an activity than another could spend less time, it is a loss that occurs due to the waste of time. On the other hand, when exercising a competence that is not within its domain, a negative or unexpected result may occur for the organization. Thus, this process of analyzing competencies according to activities, positions and functions must be continued in the organization that intends to achieve its objectives without fail and with excellent results. However, it requires careful analysis and action to avoid praising employees at the expense of others with different abilities. In addition, it is important to have a problem-solving proposition in which the executive secretary can indicate actions that other employees can improve their skills and acquire others. On the other hand, promote actions to raise awareness, disseminate and share knowledge.

It is important to highlight the difference between training (to apply knowledge immediately) and development (provides learning generating new skills) commented by Chiavenato (2004). In this bias, it is observed that even the training methods must be analyzed in order to choose the types that are coherent with the demands and needs found in the organization. Knowledge management is a key element in this process, as it requires the sharing of experiences as well as learning. Given this, Strauhs (2012) indicates that it directs the appropriate and efficient way to identify the existing knowledge in the company. Thus, the promotion of events, in which each employee can share information with other colleagues, is a way of disseminating new knowledge, and building organizational and collective competences, which are built from individual competences. According to Strauhs (2012), the manager must have mastery over the knowledge management process, considering that he can modify the internal actions of the professionals. In addition, it is possible to more accurately detect the trends that each employee has in relation to services.

This exchange of knowledge must be monitored in order to balance it with coordination by managers responsible for the respective process. Well, it is a very complex process that requires good guidance to

avoid misguided views and actions about errors and failures of employees. In addition, the entire process must be based on the strategic objective of the organization, so it is necessary to effectively follow the steps to verify that no changes have occurred during the implementation.

3 THE EXECUTIVE SECRETARY AND THE CHALLENGES IN SUPPORTING THE IMPLEMENTATION OF MANAGEMENT BY COMPETENCES.

The challenges for implementing competency management are extensive and complex to overcome, as they directly impact the actions that must be carried out. In view of this, the executive secretary, with his ability to share and act in various activities and units, will be able to contribute at the strategic level in such a way as to disseminate his support in this endeavor. In addition to being the intermediary between the implementation team and senior management, which will provide all the necessary inputs and surroundings for the feasibility of the execution. It can also demystify the idea that customs and values are permanent, indicating that they can be remodeled according to each situation and moment. On the other hand, it can contribute to raising awareness about the importance of the respective mapping, considering that according to Leme (2005) it is necessary to have intense awareness about the new model in the organization. In this perspective, the thinking of D'elia and Camargo (2013) is presented, on the integration of the secretariat with the sectors for the development of processes.

The secretarial professional inserted in the process symbolizes that the strategic level is in accordance with the actions for implementation. However, a robust investment is required for this type of model. Barbosa (2008) mentions the difficulty of obtaining unrestricted support from senior management, given the need for large investment in the strategies that must be implemented during the process. Thus, it is important that the strategic level formally indicates how much and when it intends to invest in the respective action. On the other hand, it is necessary to align all management levels of the company, and the professionals qualified for such action.

The executive secretary, as a member of this team, must recognize which are his/her competencies that will be able to collaborate in the referred process of implementation of the competency management. The alignment between the strategic guideline and the competencies that can be used and developed is a great challenge to breaking the existing paradigms and culture. In turn, it is important to reiterate that employees have support from the strategic level, aiming at actions that encourage the desire to collaborate with the institution and develop good works. In this way, people management plays an essential role in the process, as it will outline policies aimed at the integration of ideas and support between units. In this vein, it is worth noting that the model discussed in this chapter was considering its breadth, the competencies developed and managed by organizations, “(...) scarce, valuable, difficult and costly elements and imitation and replacement”. (CARBONE et al, p.33).

4 STUDY METHODOLOGY

This research had a qualitative approach, with an exploratory bias, through a review of books, studies, and works on the subject. This section presents the methodological procedures used, and the limitations of the method used.

Considering that the main objective of this research was to qualitatively discuss the actions for the implementation of management by competencies with the participation of the executive secretary, examined by the theoretical structure pointed out, which permeate the reflections. It was decided on the qualitative research method, of an exploratory nature, which is considered more suitable for the intended analysis, in which Flick (2009) confirms that qualitative research is based on multiple theories with discussion methods. On the other hand, Gil (2008) points out that exploratory research provides a holistic view of a given subject, and qualitative analysis is based on interpretation.

From this perspective, the research was planned in stages. As for the means of investigation, a bibliographic survey was carried out based on the selection of studies based on the keywords, considering that they are indicative of the subject, and through qualitative procedures with an interpretative bias. From the qualitative approaches, we opted for the discussion around the subject based on the researched authors, through the interpretative analysis of the author of this study. Cervo and Bervian (2007) understand the possibility for the researcher to analyze and correlate facts or phenomena without handling data.

As for the limitations of the method, we can mention the analyzes performed by this researcher, which are subjective and subject to other perceptions and understandings. However, it is a study that encourages new research on the subject aiming at the dissemination of knowledge and participation and secretarial practice in the competence management process.

5 FINAL CONSIDERATIONS

The study shows that management by competencies added to management by performance, and aligned with actions inherent to knowledge management, observing important aspects to its implementation, which provide the identification of individual competencies that can generate organizational competencies, and consequently, integrated in them to the actions to achieve organizational objectives. In addition, it points out the need to analyze the ideal position of the professional in the organization, in such a way that it can create relevant capacities for the solution of the organization's problems. Thus, added to the self-knowledge of the internal or external collaborator regarding their professional anchors, it can contribute to the analysis of the best capacity of the professional in the position or function. On the other hand, the view of the authors who discuss this subject corroborates the propositions that drove this study.

It is also worth mentioning the evidence pointed out about the performance and effective participation of the executive secretary in the context of the implementation process of the respective

competency management model with the support of other management dimensions mentioned during the study.

However, despite having been demonstrated through the literature in the area, that the implementation of management by competencies together with management by performance, subsidized by actions of knowledge management, can provide the transformation desired by organizations regarding the achievement of their objectives with the development and adequate positioning of the competences of its collaborators, it is understood as a limitation of the research, that the respective result has not been demonstrated in practice.

Therefore, in addition to analyzing the subject from the perspective of the theory of the authors of the area, as carried out in this study, further studies are indicated aiming at deepening of the aforementioned theme to investigate the relevance of the participation of the executive secretary professional in specific contexts with the application of a case study that offers several possibilities of techniques aiming at a survey on the perception of the secretaries and managers responsible for the implementation of this type of model in organizations with experience in the subject, and that have in their staff the respective professional acting.

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CHAPTER 92

Excessive supplementation with folic acid during prenatal care: literature review

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ABSTRACT

Folic acid supplementation to prevent neural tube closure defects is recommended as part of prenatal

care. The guidelines recommend administering 400µg daily of FA, and this dose cannot exceed 1000µg daily. However, it is not uncommon to encounter cases in which the intake of FA exceeds the recommended doses, which is a worrying reality since the effects resulting from the chronic use of high doses of this vitamin are not yet fully understood. A broad analysis of the literature pertinent to this theme from the last 10 years, was verified and 09 articles were selected. Some of the harms that may be associated with excess FA in prenatal care include increased risk of developing childhood asthma, as well as upper airway infections and wheezing; exacerbation of B12 deficiency; fetal growth impairment; influence on brain development (autism); allergic reactions (eczema); cancer promotion (breast tumor and colorectal adenoma); increased insulin resistance in children; and risk of gestational diabetes. This study warns about the importance of the adequacy of the SUS in providing FA tablets at the appropriate dose for pregnant women since the tablets offered by SUS are at a dose of 5mg, which is approximately 10 times higher than recommended.

Keywords: Folic acid, Dietary supplementation, Prenatal

1 INTRODUCTION

Folic acid (FA) plays an important role in nucleotide synthesis and DNA replication, and its deficiency primarily affects rapidly dividing tissues (ULRICH and POTTER, 2006). FA deficiency in fetuses is associated with a variety of disorders, including defects in neural tube formation, resulting in fatal anencephaly or spina bifida, with varying degrees of impairment (BURDGE and LILLYCROP, 2012) . In pregnant women, it can lead to anemia, since the demand for folic acid increases during pregnancy (BRASIL, 2013).

Folate is directly related to the prevention of neural tube defects, as well as the prevention of other diseases such as cardiovascular problems, Alzheimer's disease, some types of cancer, among others. Several studies have shown that this vitamin can help in decreasing plasma homocysteine concentrations, reducing acute myocardial infarction and cerebrovascular diseases. Folate deficiency can be caused by different conditions, such as a low folate diet or decreased absorption, for example, from alcoholism. Certain

conditions such as pregnancy or cancer result in increased rates of cell division and metabolism, implying an increase in the body's demand for folate. Some medications can also contribute to this deficiency, such as trimethoprim, methotrexate, anticonvulsants and birth control pills. A folate-deficient diet can lead to the development of megaloblastic anemia after four months, in addition to potassium deficiency (ALABURDA and SHUNDO, 2007).

Supplementation with FA is a strategy for the prevention or treatment of developmental defects. Therefore, supplementation in pregnant women is related to the search for reducing the incidence of neural tube defect (NTD), which is the most common congenital malformation during pregnancy. The supplementation of PA during pregnancy was initially proposed in 1964, with this objective (BURDGE and LILLYCROP, 2012).

Several countries have regulated PA supplementation 3 months before conception and during the first trimester of pregnancy with a dose of 400µg daily, which can be increased to 5mg daily if the woman has a previous history of having a child with this malformation (BURDGE and LILLYCROP, 2012). Since the implementation of fortification, the number of NTDs has decreased significantly (MURRAY; SMITH and JADAVJI, 2018).

According to the Brazilian Ministry of Health, folic acid supplementation to prevent neural tube malclosure is recommended as part of prenatal care and should be started in the preconception period, at least 30 days before the date on which it is planned to become pregnant, and maintained throughout pregnancy (BRASIL, 2013). In Brazil, until 2012, the daily use of 5mg of folic acid was recommended until the end of pregnancy. However, currently, the guidelines emphasize that 400 µg of folic acid daily should be administered to all women until the end of pregnancy, and this dose cannot exceed 1000 µg daily. (BRAZIL, 2013). However, it is not uncommon to come across cases where folic acid intake exceeds recommended doses. Therefore, both mother and fetus are exposed to excessive doses of folic acid, which is a worrying reality, since the effects resulting from the chronic use of high doses of this vitamin are still not fully understood (ULRICH and POTTER, 2006).

Higher doses of PA are recommended in some special situations, such as: women with diabetes (VALENTIN et al., 2018), epilepsy (BJØRK et al., 2018) and a history of NTD (ASADI-POOVA, 2015). In these cases, it is recommended to take a daily dose of 5000µg of PA (NAVARRETE-MUÑOZ et al., 2015). Obese women also need higher doses of PA supplement. Association guidelines in the UK, Australia and New Zealand advise a higher dose of PA for obese women, while in the US and Canada the guidelines do not make a recommendation on this matter. Interestingly, in the US, fortification of foods with folate is mandatory, while in the UK, Ireland and other European countries it is voluntary. The recommendation for obese women in Ireland is a dose of 5mg per day, which is available on prescription, although there is little evidence in the literature to justify this specific dose (O'MALLEY et al., 2018).

Epidemiological studies have shown that a significant number of women who supplemented with PA during pregnancy exceeded the tolerable limit recommended by the Brazilian Ministry of Health of 1,000µg/day (HOYO et al., 2011; WEST et al., 2012) .

The clinical significance of chronic or high intake of PA is not well established. Therefore, concern has arisen regarding the potential health effects, as in addition to fortified products, there is also widespread use of supplementation, including vitamins used in prenatal care, as well as energy drinks that are fortified with various vitamins. High intake of supplemented PA, along with food fortification, resulted in elevated red blood cell folate values among pregnant women and women of reproductive age (LAMERS et al., 2018) .

Results from several studies suggest that FA supplementation can induce aberrant patterns of DNA methylation, and mechanically play a role in carcinogenesis (ULRICH and POTTER, 2006; BARUA; KUIZON and JUNAID, 2014) . However, a meta-analysis performed with 50,000 individuals evaluated the effects of PA and demonstrated that PA supplementation does not substantially increase or decrease the incidence of cancer. (VOLLSET et al. , 2013) . Furthermore, supplementation with AF-containing prenatal multivitamins has been seen to be associated with a significant protective effect in pediatric cancers such as: leukemia, pediatric brain tumors, and neuroblastoma (SINGER et al. , 2016) .

Although controversial, over-supplementation is involved in certain chronic diseases and does not reduce cardiovascular disease (SAUER; MASON & CHOI, 2009) . Furthermore, acute folate intake also results in downregulation of folate transporters in the kidney, causing a dysregulation in the process of renal folate uptake (THAKUR et al. , 2014) . Several randomized and observational studies have suggested that maternal multivitamin intake with AF during pregnancy may modulate pregnancy-related outcomes (TIMMERMANS et.al. , 2009 ; CATOV et al., 2009 ; CATOV et al., 2011) including outcome in offspring development.

In order to evaluate publications related to folic acid supplementation during pregnancy and possible consequences associated with excess folic acid, a comprehensive review of the literature relevant to this topic was performed. Given that there is no benefit from an intake of PA above the recommended dose, the current dose of PA from supplements offered by the SUS should be reassessed.

2 METHODOLOGY

A systematic review study was performed based on the *preferred criteria. reporting items for systematic reviews and meta -analyses* (PRISM), in October 2020, using the following MeSH descriptors (<https://decs.bvsalud.org/>) associated: “folic acid” AND “dietary supplementation” AND “prenatal”. Research from meta-analyses, systematic reviews, original studies and clinical guidelines were selected. The searches were performed by the VHL (<http://brasil.bvs.br/>) in the MEDLINE (<https://medlineplus.gov/>) and LILACS (<https://lilacs.bvsalud.org/>) databases , in publications of the last 10 years, in Portuguese and English.

2.1 INCLUSION AND EXCLUSION CRITERIA

Studies of pregnant or preconception women and children whose maternal supplementation with folic acid during pregnancy was known were included. The intervention evaluated was the effects of excessive folic acid supplementation during pregnancy.

Studies with animal models, duplicate articles, incomplete texts, and those not available in full *online*, as well as opinion articles and articles that deviated from the proposed theme were excluded .

2.2 DATA EXTRACTION AND RISK OF BIAS

The following data were extracted from each study: authors and year; study design; sample size; objective; effects of excess folic acid. The title and abstract of each search result were screened by two reviewers who independently applied the same inclusion and exclusion criteria. There was no dissent.

3 RESULTS

A total of 520 articles were found in the VHL (03/10/2020) when the descriptors “folic acid” AND “dietary supplementation” AND “prenatal” were used in association. After inserting the following filters: articles from MEDLINE and LILACS, in Portuguese and English, full articles and articles from the last 10 years, as well as the main subjects: folic acid, prenatal care and nutritional supplements, a total of 258 articles were selected. for reading titles and abstracts.

After reading the title and abstracts, 221 articles that did not describe excess folic acid were excluded. And later another 14 articles were excluded because they were studies with animal models. A total of 23 references were selected for full-text evaluation, with 9 articles being selected that described the consequences of excessive PA during pregnancy.

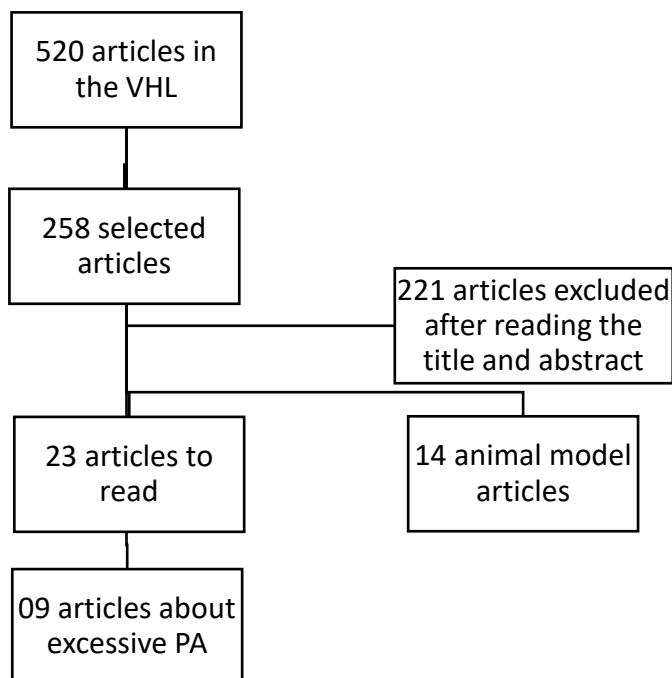
The flowchart for the search strategy is shown in Figure 1, and the selected articles are shown in Table 1.

Table 1. Articles selected in the review.

REFERENCE	STUDY	OBJECTIVE	EFFECTS OF EXCESS FOLIC ACID
DUNSTAN et. al., 2012	Prospective 628 pregnant women and 484 children	The relationship between maternal folate “ <i>status</i> ” during pregnancy, cord blood folate levels, and early childhood allergy problems	Higher doses of AF > 500µg/day given during the third trimester of pregnancy were associated with a risk of eczema and had no effect on other allergic conditions.
BARUA; KUIZON and JUNAID , 2014	Literature review	PA supplementation in pregnancy and health implications	<ul style="list-style-type: none">• Dysregulation of renal folate uptake,• Asthma,• Influence on brain development,• Aberrant patterns of DNA methylation.
ASADI-POOYA, 2015	Literature review	To assess the safety of high-dose PA supplementation in women with epilepsy	Adverse effects on fetal brain development.

VALERA-GRAN et. al., 2017	Prospective 1,682 mother-child pairs	Effect of high maternal doses of PA supplements on neurocognitive development in 4- to 5-year-old children	The use of PA dosages exceeding 1000 µg/d during the preconception period was associated with lower levels of neurocognitive development
PARR et. al., 2017	Cohort 1,901 children and 1,624 mothers	Assess maternal folate intake during pregnancy and asthma in children	Pregnant women with FA at or above recommended supplementation, combined with a diet rich in folate, are associated with an increased risk of asthma in children.
LAMERS et. al., 2018	Workshop 38 health groups	Aligning recommendations for PA supplementation in pregnant women and women of childbearing age	<ul style="list-style-type: none"> • impairment of fetal growth, • cancer promotion, • Interaction with B12 deficiency, • Increased risk of asthma and autism.
MURRAY; SMITH and JADAVJI, 2018	Literature review	To determine whether excess maternal supplementation with FA affects child neurodevelopment	<ul style="list-style-type: none"> • Autism, • Late pubertal stage (13.5 years), • Increased insulin resistance (9.5 years and 13.5 years).
VALENTINE et. al., 2018	Literature review	AF supplementation in pregnancy	<ul style="list-style-type: none"> • Colorectal adenoma and breast cancer is cause for concern in older pregnant women, • B12 deficiency exacerbation, • Increased risk of respiratory infection and asthma in children.
HUANG et. al., 2019	Prospective 348 pregnant women at 16-18 weeks of gestation	To assess the association between duration of PA intake and risk of gestational diabetes mellitus in Chinese women.	Change in lipid profile in the second trimester of pregnancy and risk of gestational diabetes associated with prolonged use.

Figure 1. Evaluation flowchart of the articles obtained.



4 DISCUSSION

Several studies agree with regard to the ideal dose of folic acid that should be used in supplementation during pregnancy (ULRICH and POTTER, 2006; HOYO et al., 2011; BURDGE and LILLYCROP, 2012). The WHO and the Ministry of Health (BRASIL, 2013) recommend a daily dose of 400 micrograms in order to avoid complications such as neural tube malformation, low birth weight and anemia during pregnancy. However, the Ministry of Health recommends different doses: 400µg/day for pregnant women, 1000µg/day in special situations during pregnancy – multiple pregnancy and 5mg/day for epileptic pregnant women (BRASIL, 2013).

The large number of pregnant women using high doses of PA may be related to medical reasons, as women with diabetes, epilepsy or a history of NTDs before pregnancy are recommended to take doses of 5mg/day (NAVARRETE-MUÑOZ et al., 2015). ; BJØRK et al. , 2018) there are also reports of increased doses of PA as prevention of oral clefts (WEHBY et al., 2012) . The use of these high doses of PA are unnecessarily continued after the third month of pregnancy (NAVARRETE-MUÑOZ et al., 2015) .

The guidelines of some countries, such as Ireland, advise a higher dose of PA for obese women (5mg/day), although there is no evidence in the literature to justify this dose. It has been observed in studies that obese pregnant women have a lower level of maternal folic acid and vitamin B12 than women with a normal BMI (O'MALLEY et al. , 2018; WEN et al., 2018) . The authors also guide vitamin B12 supplementation in obese women to prevent NCDs.

To determine the effectiveness of high-dose folic acid for preventing preeclampsia in women with at least one pre-existing risk factor: hypertension, gestational diabetes (type 1 or 2), or a body mass index ≥ 35 , a double-blind, multicenter, randomized controlled trial in 2464 pregnant women between 2011 and 2015 (1144 for the folic acid group and 1157 for the placebo group). Women were randomly assigned to receive either high-dose daily folic acid (four 1.0 mg oral tablets) or placebo between eight weeks and 16 weeks' gestation until the end of pregnancy. Folic acid supplementation at 4.0 mg/day in the first trimester did not prevent preeclampsia in women at high risk for this condition (WEN et al., 2018) .

A study among pregnant women in Spain showed that the majority of women did not follow the recommendations of 400µg/day of PA during pregnancy, using doses below or above the recommendation. More than half of the women used low doses of PA in the first and second period of pregnancy, due to previous pregnancy, smoking, alcohol consumption, unplanned pregnancy and no history of miscarriage. While 29% and 17% took high doses of PA, in the first and second period of pregnancy respectively, due to alcohol consumption, unplanned pregnancy and history of miscarriage. Public health strategies should be designed to raise awareness of the appropriate perception of PA use and to encourage healthcare professionals to avoid using PA dosages above or below current recommendations. (NAVARRETE-MUÑOZ et al., 2015) .

The considerable number of women who do not use PA can be explained in part by the fact that they were not aware of being pregnant and therefore were not informed of the benefits of PA in early

pregnancy. However, when women are aware of pregnancy and the benefits of PA, they increase PA use, particularly in the second and third month of pregnancy (NAVARRETE-MUÑOZ et al., 2015).

AF is already added to foods for fortification in addition to the naturally occurring folate in foods. Thus, if FA supplements are also taken during pregnancy, the mother and fetus may be exposed to FA in excess of the recommended upper tolerable limit of 1,000µg/day for adult pregnant women. In the SUS, the dose of PA provided to the population of pregnant women is one tablet containing 5mg. This dose is above the dose recommended by the Ministry of Health of 400µg/day. Which exceeds the tolerable upper limit by 5 times. Thus, given the possibility of harm and the lack of proof of its efficiency when used in high doses, it is necessary to review the indication of excessive doses, especially those above 1,000µg/day.

For a better understanding of the effect of PA supplementation on pregnant women, we systematically reviewed the recent literature (2010-2020) in order to assess the health outcome of newborns and pregnant women. The limited number of studies included in this review, as well as the heterogeneity of their methodologies (Table 2), are the main limitations of this work. The literature review was difficult due to the inconsistent application of the term supplementation, which does not indicate high doses of PA consumption, and the application of the term “high”, which has different interpretations.

Table 2 . Methodology used by the 09 selected studies.

KIND OF STUDY	THE AMOUNT
PROSPECTIVE	3
WORKSHOP	1
LITERATURE REVIEW	4
COHORT	1

Of the 23 pre-selected studies, only 09 were included in the review, as they met the inclusion criteria, the other 14 studies did not report the effects of excess folic acid, therefore they were not included at the end of the review.

Of the 09 selected studies, 03 studies (DUNSTAN et al., 2012, VALERA-GRAN et al., 2017; HUANG et al., 2019) are prospective studies and 01 study (PARR et al., 2017) is a cohort study; these study models present better levels of scientific evidence. Four studies were selected (BARUA; KUIZON and JUNAID, 2014; ASADI-POOVA, 2015; MURRAY; SMITH and JADAVJI, 2018; VALENTIN et al., 2018) of literature review and 01 Workshop (LAMERS et al., 2018) between countries.

Two studies were excluded (HOYO et al., 2011; NAVARRETE-MUÑOZ et al., 2015) , as they only describe which population ingests high doses of PA. Two randomized controlled trials (WEHBY et al., 2012; BORTOLUS et al., 2014) were excluded. These studies have a strong power of experimentation, but they are not yet finalized. Most studies (SAUER; MASON and CHOI, 2009; PAPADOPOULOU et al., 2013; CZEIZEL; VERECZKEY and SZABÓ, 2015; SINGER et al. , 2016; SCHMIDT et al., 2017; ALFONSO et al., 2018; GOODRICH et al., 2018) describe only the benefits of PA intake. Two other studies recommend high doses (HUHTA and LINASK, 2015; BJØRK et al. , 2018) , for preventing heart

problems, and two other studies (O'MALLEY et al. , 2018; WEN et al., 2018) demonstrate that higher doses for obese women do not show great results.

4.1 EFFECTS OF EXCESS FOLIC ACID

Regarding the abusive use of folic acid, there is great uncertainty among the authors about the potential harmful effects that this vitamin could have on the health of the mother and the fetus when in excess. Some of the harm that may be associated with this excess are an increased risk of developing childhood asthma (PARR et al., 2017; LAMERS et al., 2018; VALENTIN et al., 2018) and the risk of upper airway infections and wheezing (PARR et al., 2017) in early childhood. In addition, studies indicate that excess folic acid promotes dysregulation of the process of renal folate uptake (BARUA; KUIZON and JUNAID, 2014) .

The high concentration of folate after fortifications may be influencing other normal biological processes, such as: aberrant patterns of DNA methylation (BARUA; KUIZON and JUNAID, 2014) and masking maternal vitamin B12 deficiency. Vitamin B12 deficiency is associated with impaired fetal growth (LAMERS et al., 2018) and irreversible neurological damage if not correctly diagnosed and treated (ASADI-POOVA, 2015; VALERA-GRAN et al., 2017) .

Excessive PA during preconception has also been associated with behavioral problems in children (VALERA-GRAN et al., 2017) . The study by Valera-Gran et al., 2017, suggests that the ingestion of high doses of PA can cause neurocognitive problems ; and corroborating with other studies, it can cause autism (LAMERS et al., 2018; MURRAY; SMITH and JADAVJI, 2018) .

Other theoretical risks are allergic reactions and eczema (DUNSTAN et al., 2012) as well as carcinogenic effects, since PA supplementation can increase the speed of proliferation of pre -neoplastic cells and subclinical cancers in pregnant women (BARUA; KUIZON and JUNAID, 2014; VALENTIN et al., 2018) .

More recent studies demonstrate changes in the pubertal stage in children aged 13.5 years; increased insulin resistance at 9.5 years and 13.5 years (MURRAY; SMITH and JADAVJI, 2018) ; change in lipid profile in the second trimester and risk of gestational diabetes (HUANG et al., 2019) .

The main effects of excess folic acid after reviewing the literature are described in table 3.

Table 3. Main effects of excess folic acid.

Too much folic acid	Upper airway infections and wheezing (Asthma)
	Dysregulation of the process of renal folate uptake
	Aberrant DNA methylation patterns
	B12 deficiency exacerbation
	Compromised fetal growth
	Late pubertal stage (13.5 years)
	Influence on brain development (Autism)
	Allergic reactions (Eczema)
	Cancer promotion (Breast Tumor and Colorectal Adenoma)
	Increased insulin resistance

Since folate levels can influence DNA methylation, further studies are needed in the future to explore the systemic differences in DNA methylation profile in relation to time and dosage of FA supplementation between different populations and between genders (BARUA; KUIZON and JUNAID, 2014) .

Huang et al., 2019 showed that most women take PA for a longer period, instead of following the recommendations of taking 400µg/day of PA for 3 months before pregnancy until the end of the first trimester. It was observed that duration or different periods of FA supplementation are associated with a higher risk of gestational diabetes when FA was taken for more than 90 days. It was also observed in this study that non-supplementation with PA during the prenatal period is related to the incidence of gestational diabetes. Thus, not taking AF or taking AF for a longer duration may not be safe for pregnant women (HUANG et al., 2019) .

The high intake of PA is related to Caucasian race, advanced maternal age and complete higher education (HOYO et al., 2011) , as they represent greater resources for access to PA supplementation, suggesting the need for reeducation in the entire population about the use of AF currently recommended.

Concern about the appropriate dose and potential side effects is still a matter of debate. As maternal FA supplementation has the potential to induce epigenetic effects in the offspring genome, which may vary with the individual's metabolic capacity, race, sex, geographic location or interactions with other nutrients, a possible reason for inconsistency between studies could be due to differences in the study design. In the future, there is definitely a global need for collaboration to accumulate scientific evidence from a clinical perspective, and to interpret these interventions and potential effects (BARUA; KUIZON and JUNAID, 2014) .

4.2 CLINICAL CONSIDERATIONS

Folate deficiency, a treatable condition, remains a public health concern. It should be known to everyone that 400µg/day of PA initiated 4 weeks before and up to 12 weeks after conception is effective. The exception is made for women with diabetes, epilepsy and a history of defects in the formation of the neural tube, who are recommended to take a daily dose of 5mg .

The PA pills offered by the SUS characterize an overdose. That is, the recommended dose is 400µg/day, and the currently offered dose of 5mg/day is approximately 10 times higher than recommended. Therefore, the adequacy of the SUS in providing pills in adequate doses is important.

5 CONCLUSION

The data presented in this review show that women of childbearing age should use with caution and not exceed the Ministry of Health's recommended daily intake of folic acid, as there is considerable

evidence that excess folic acid can lead to potential adverse effects for both mother and for the fetus. The dangers of high levels of folic acid, whether obtained through supplementation or naturally, are still not well understood. Therefore, additional studies are needed to determine the most effective dose of folic acid, the upper limit of folic acid intake, and the timing of folic acid supplementation.

Public health strategies should be devised to raise awareness of folic acid use in pregnancy and encourage healthcare professionals to avoid using folic acid dosages above current recommendations.

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CHAPTER 93

Bioethical principles and their application against Hepatitis B virus infection

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ABSTRACT

Bioethics has the function of ensuring the well-being of people, guaranteeing and avoiding possible

damages that may occur to their interests, and providing the professional and those who are served by him, the right to respect and will, respecting their beliefs and values. Objective: to highlight the bioethical principles and their application against Hepatitis B virus infection in the light of the literature. Methods; This is a review of mixed studies, published on the bases of the National Library of Medicine (PUBMED), Latin American and Caribbean Literature on Health Sciences (LILACS), and Scientific Electronic Library Online (SCIELO), in the chronological period between 2012 to 2022. Results: It was evidenced that chronic HBV infection is the main cause of Liver Cirrhosis and hepatocellular carcinoma and that vaccination is an effective way to change this scenario. The vaccine contemplates the bioethical principle of justice and scientific evidence supports beneficence, however, adverse effects interfere with non-maleficence. However, side effects result in conflicts involving the principle of non-maleficence. These consequences are intensified when they are associated with individual and/or collective factors, which can interfere with the individual's autonomy in adhering to such a prevention measure. Conclusion: The treatment and prevention of Hepatitis B should be widely discussed in association with bioethical principles, developing health actions that can guarantee the individual the principles of autonomy, beneficence, non-maleficence, and justice.

Keywords: Bioethics; Infection; Hepatitis B.

1 INTRODUCTION

The emergence of bioethics occurred at a time when the distance between science and the humanities seemed insurmountable and took place with the aim of overcoming this fact that proved to be harmful to the future development of the humanity and for the maintenance of conditions in gives population (Zanella, 2018).

It can be understood as a means capable of ethically valuing and legitimizing human actions that may have an irreversible impact on the life events of the population, intending to resolve existing conflicts and moral dilemmas in the relationships and interactions between institutions, teams and environments, especially those related to the health of individuals (Schram, 2017).

Among the principles of bioethics are the principles of beneficence and non-maleficence, linked to actions that are capable of to promote good and avoid evil, the principle of autonomy, considering the patient as an active subject in the process therapeutic, and the principle of justice, related with the equality in treatment between you subjects (Drummond, 2017).

Faced with the problem of Hepatitis B virus (HBV) infection, this fact represents an important problem of public health, since it has already been able to infect approximately 2 billion people worldwide, being that around 350 million people with the disease progressed to Liver Cirrhosis and Hepatocellular Carcinoma, in addition to be responsible for about 1 million deaths per year and due to the complexity of treatment and follow-up, That question he can compromise at questions bioethics required for the case (Trepus, et al., 2014).

For O confrontation of that problem, The Assembly world gives Health adopted The first Strategy Global of Sector of Health on Viral Hepatitis, for the period 2016-2021. The strategy was aimed at eliminating hepatitis as a problem in health public. At the however currently at goals global defined for reduce at new infections per hepatitis viral in 90% and reduce at deaths attributable to hepatitis viral in 65% until 2030 (Hsu, & Chang, 2019).

In Brazil, during the period from 1999 to 2020, they were registered in the Information System of Notifiable Diseases (SINAN) 254,389 confirmed cases of hepatitis B (HB), being 34.2% in the Southeast region, followed by the South regions (31.8%), North (14.7%), Northeast (10.3%) and Central-West (9.0%). In this period, the highest detection rate was observed in 2011 (8.4 cases for 100 thousand population) and The smaller in 2020 (2.9 cases for 100 thousand population). It was evidenced predominance at the genre male (54.8%), age group from 25 to 44 years (49.0% of cases), self-declared brown color (42.7%) and in people who had in between the 5th and The 8th grade incomplete (17.0%). THE chronic form was found in 72.9% (Brazil, 2021).

Currently, vaccination against HBV is the most effective way to prevent infection, so it is used worldwide and facing the association as the principles of bioethics, where an important relationship of the bioethical principle of justice is evidenced, related to the right to access immunobiologicals. However, the adverse effects of the vaccine, arouses conflicts between the bioethical principles of beneficence and non-maleficence, which can intensify when associated with personal factors, relatives and/or community (Sugarman et al. 2017).

In this sense, HBV B infection assumes a relevant public health issue, requiring studies that present up-to-date data on the infection, clinical forms and complications, in order to intensify the actions of prevention and improve therapeutic strategies, associating them with the contemplation of bioethical principles, which must be addressed and insured to individuals (Hsu & Chang, 2019).

In this way, to highlight the bioethical principles and their application against Hepatitis B virus infection in the light of the literature.

2 METHODOLOGY

This is a systematic literature review study, carried out through a bibliographic survey using if data from secondary sources. Systematic review is a research modality, which follows specific protocols and seeks give some logic to a great corpus documentary (Galvão & Ricarte, 2019).

The guiding question adopted for this study was what is the application of the bioethical principles of autonomy, justice, beneficence and no maleficence in front of control of infection fur virus gives Hepatitis B with emphasis on vaccination?

The steps taken to put this review into operation were: 1.choice of the guiding question; 2- selection of studies composed the sample based on the inclusion and exclusion criteria of the research; 3- establishment of information that will be captured and classification of studies; 4- Analytical judgment of the articles included in the review; 5- critical analysis of included articles and discussion of results; 6- report of the review and synthesis of the information acquired in the course of the other steps .

Data collection was carried out from May 1 to 30, 2022 and For the selection of articles, the following were used. following databases: National Library of Medicine (PUBMED), Latin American and Caribbean Literature in Sciences of Health (LILACS) and Scientific electronic library online (SCIELO), using you descriptors/Mesh: hepatitis, infection, bioethics at the period chronological understood in between 2012 to 2022 .

The inclusion criteria used were: available electronically for free, articles published in the Portuguese and English, full text with abstracts available and published in the last 10 years (2012 to 2022). The criteria for exclusion were as follows: articles that did not answer the guiding question of the research and that they were duplicated in the many different bases of data .

After applying the aforementioned criteria, a total of 103 articles were found. After reading the intact From articles were selected 10 studies what answered the question guiding gives search.

Painting 1. Selection From articles included in the study.

1st Search: Association From descriptors	Criterion 01	Criterion 02	Criterion 03	Criterion 04	Criterion n05	TOTAL
hepatitis, infection, bioethics PUBMED 24 articles	Available free19	Language Portuguese English16	year of Publication 2012 -2021 16	exclusion of articles duplicates 13	answer the questionguiding 5	5
Hepatitis, Infection, Bioethics LILACS 24 articles	Available free12	Language Portuguese English12	year of Publication 2012 -2021 12	exclusion ofarticles duplicates 8	Reply The questionguiding two	two
Hepatitis, Infection, Bioethics SCIELO 55 articles	Available free34	Language Portuguese English21	year of Publication 2012 -2021 21	exclusion ofarticles duplicates 9	Reply The questionguiding 3	two
Total General						10 articles

Source: authors.

After search, careful readings of the 10 selected publications were carried out to elaborate the present review. THE analysis From Dice he was carried out in form descriptive, proceeding The categorization From Dice extracted From studies selected in thematic groups, from the identification of variables of interest and key concepts, thus the Results were categorized in a table adjusted for this purpose containing the following items: author, year, journal of publication and title of the research, in order to provide a comparative analysis, so that they would enable The acquisition of answers to problem of study.

The research was not submitted to the local Research Ethics Committee (CEP), as it was a study based on sources. secondary and do not fall within the legislation of CONEP/MS, resolution 466/2012.

3 RESULTS

Table 2 shows the articles included in the sample that answered the guiding question proposed for the study, namely: what is the application of the bioethical principles of autonomy, justice, beneficence and non-maleficence in the face of infection control by the virus of hepatitis B with emphasis on vaccination?

Painting two: Summary From articles included in the sample.

AUTHOR	YEAR	JOURNAL	TITLE
Lessa, S. D. Ç.	2013	Portal education	Childhood vaccination and postnatal adverse events vaccination: contribution of bioethics to implantation of policies compensatory at the Brazil
Lessa, S. D. Ç., & Dórea, J G	2013	Magazine bioethics,	bioethics and childhood vaccination in pasta
Lessa, S. D. Ç., & Schramm, F. R.	2015	Science & Health Collective	Individual protection versus collective protection: bioethical analysis of the national program of childhood vaccination in pasta.
Souza de Jesus, A., Rodrigues de Jesus, L., Vieira, VDO, da Silva Sena, EL, Silva in Oliveira Boery, R. N., & Yarid, S.D	2016	Minutes bioethics	Aspects bioethical gives vaccination in pasta in Brazil.
Sugarman, J., Revill, P., Zoulim, F., Yazdanpanah, Y., Janssen, H. L., lim, S. G., & Lewin, S.R	2017	BMJ journals	ethic and search for a Hepatitis B cure
Schramm, F. R.	2017	Science & Health Collective	THE bioethics in protection: one tool for the evaluation of sanitary practices?
Pereira, EL, Brito, R. Ç., & Oak, M. T. M	2018	Annals in Medicine	THE vision bioethics the respect gives to vaccination
Zanella, D. Ç.	2018	Interface-Communication, Health, Education	Humanities and science: a reading from the bioethics in Van Rensselaer
Hsu, H. Y., & Chang, M. H	2019	The Journal of Pediatrics	Hepatitis B virus infection and the progress in the direction eliminate it
Moura, EC, Santos, CRD, atzingen, DAN CV, & Mendonça, THE. RD A	2021	Magazine bioethics	Vaccination in Brazil: reflection bioethics about accessibility.

Source: authors.

The results shown in table 2 show that the 10 studies included in the sample were published in the years 2013 (2), 2015 (1), 2016 (1), 2017 (2), 2018 (2), 2019 (1) and 2021 (1). The studies were published in national and international journals and focused on thematic.

4 DISCUSSION

THE discussion constituted a corpus of study grouping you themes most addressed in the following categories: Epidemiological information of Hepatitis Virus Infection B and Bioethical Aspects applied against Infection by the Virus of Hepatitis B.

I- Information epidemiological gives infection by Virus gives Hepatitis B

It is estimated that approximately two billion individuals had previous contact with HBV and that the infection chronic disease affects approximately 350 million people worldwide, and may develop symptomatically, oligosymptomatic or asymptomatic, being the main cause of Liver Cirrhosis and Hepatocellular Carcinoma (HCC), in addition to in to be responsible 500,000–1,200,000 deaths per year in result in complications caused fur HBV, characterizing an important it's worrying problem of health public at the world (Trepus, et al., 2014).

According to the Ministry of Health (MS) 15% of the Brazilian population has previous contact with HBV, and about 1.5% are chronic carriers, most of whom are unaware of their carrier status, constituting an important factor in the virus spread. The occurrence of the disease may vary from region to region, according to the socio-economic situation. population, significantly affecting those who live in precarious and promiscuous situations (Brasil, 2010; Costa et al. al., 2013).

The epidemiology of this infection can be classified into three categories of endemicity: High, middle and low as the proportion of the population reacting to HBsAg. Data show that the Northern Region of Brazil is configured as the region with the highest prevalence of HBV infection, thus the Amazon is characterized by the region with the highest endemicity of the disease in the country, with the South region presenting the lowest prevalence, and the Central-West regions, North East and Southeast considered regions in prevalence intermediate (Nascimento, et al., 2012; Silva, et al., 2015).

In Brazil, there is an increasing trend of HBV towards the south/north regions, determining three patterns of distribution: high endemicity in the Amazon region, in some municipalities in Espírito Santo and in western Santa Catarina; intermediate endemicity, present in the northeast, midwest and southeast regions; and low endemicity in the southern region of the country. A study carried out in the northern region, state of Acre, highlights the importance of horizontal transmission, such as dissemination and perpetuation of virus intradomiciliary (Lobato et al. 2006; Brazil, 2018).

The endemicity of HBV infection can be assessed by the prevalence of seropositivity of the markers serological tests, which indicate current or previous contact, and classifies it worldwide into three patterns: low (<1%), intermediate (1 to 5%) and high (>5%) endemicity. In regions with high endemicity, it is evident that perinatal and horizontal transmission are the most common forms of HBV infection, the latter being mainly in the first 5 years of life (Liaw & Chu, 2009 ; world Health Organization, 2009).

Thus, another study carried out in Acre, a region of high endemicity for the disease, showed that the reactivity to HBsAg and total anti-HBc in the population studied, showed a correlation with alcohol abuse,

with the range older age, male gender, previous surgeries and the presence of tattoos were exclusively related to the larger reactivity to total anti-HBc (Silva et al., 2017).

The diagnosis of the disease includes examinations in a laboratory environment and rapid tests in order to characterize the infectious agent and your gravity disease and can be accomplished through serological tests that involve immunological reactions, which are able to determine the different phases of the infection classified as acute and chronic, immune or susceptible. The main serological markers related to HBV are Hepatitis B Surface Antigen (HBsAg), Total antibodies against Hepatitis B virus core (Anti-HBc) and Antibody against Hepatitis B Surface Antigen (Anti-HBs) (Brazil, 2009; Hermes Pardini, 2016).

Due to the severity of the problem, early diagnosis of the disease, rapid diagnosis of viral hepatitis and timely referral of infected people for treatment. Accurate and early diagnosis of these diseases allows an adequate treatment and directly impacts the quality of life of the individual, being still a powerful instrument in prevention of complications most frequent, as cirrhosis advanced and cancer hepatic (Brazil, 2016).

THE main form prophylactic for the combat the HBV and the vaccination what is it incorporated in the Brazil in nineteen ninety, initially for hyper-endemic regions, such as the Amazon region and from 1998 onwards it became universal at birth, being then incorporated progressively others tracks age up until what in 2016 all The population he was included regardless of age or risk factor, proving to be effective in preventing acute and chronic liver disease and its progression to cirrhosis and/or hepatocarcinoma is largely helpful in decreasing virus transmission. she must be administered at the neonate in the first 12-24 hours after O childbirth, or soon after to be exposed to virus, second the scheme vaccine two more applications are necessary within one month and six months after the first dose (Nunes, 2013; Brasil, 2014; Gomes, 2017).

In those countries what started in form routine The vaccination against O VHB since The decade in 80, you studies show changes in the endemicity profile of infection by this virus (Lok et al., 2016). In Brazil, the same trend is shown in works carried out) in the municipality of Lábrea, which show a reduction in the infection rate, which was 15.3% in 1988 to 3.7% in 1998, as well as in the state of Paraná, where a study identified the impact of vaccination on reducing of the incidence of HB cases in the region, in the age group from 0 to 9 years, and confirmed the effectiveness of the vaccine as a measure of control of this grievance (Braga, et al., 2005; pudelco, et al., 2014).

It should be noted that children and adolescents represent a high risk group for infection by the HBV, mainly those of lesser purchasing power. In addition to vaccination programs against this infection, investment should be made in activities educational what address The importance in conclude O scheme proposed, in that sense reaffirms The importance in effectively develop immunization programs in schools, as the concentration of this population in the same place and period facilitates follow-up and control, thus ensuring the administration of the complete series of doses required for immunization against illness (Oliveira et al. 2007).

II - Aspects bioethics applied front The Infection by the virus gives Hepatitis B.

In a democratic and plural society, citizens can make independent choices, based on the correlation in between yours rights and duties. In this sense, The autonomy refers The perspective in what each to be human he must to be truly free. However, in our cultural universe, autonomy may not be limited to the patient, especially when treating them. whether of children, adolescents or other people with limited decision-making capacity, whose responsibility extends to others elements of the family, constituting the Autonomy Family (Nunes, 2017).

Sexually Transmitted Infections (STIs), including hepatitis B, are among the health problems that most afflict the world population, deserving the concern of health managers, since the times of ancient history. THE The individual's autonomy can make him susceptible to risky behavioral activities, such as early start of activity sexual intercourse, the promiscuity of partners and the sharing of personal objects, as well as intimate relationships without condoms. In order to intervene in these factors, the citizen must undergo guidance in public, academic and/or public health activities. family, making them aware of susceptible infections, as well as the perception of their responsibility as an "agent transmitter". (NS, 2003).

Thus, evidence-based medicine (EBM) is based on the scientific literature of reference, which is based on the evaluation of different methodologies, resulting in the conscious and judicious use of the best existing evidence in clinical practice, that assists in decision making regarding a person's health care. However, EBM cannot interfere with the autonomy of patient after all the professional treats individuals and not illnesses (Nunes, 2017).

The HBV vaccine contemplates the bioethical principle of justice, associating itself with the doctrinal principles of the SUS (universality, completeness and equity). In addition from that, evidence scientific prove The efficiency gives said vaccine, exercising the bioethical principle of beneficence, however, does not rule out adverse effects, compromising the principle of non-maleficence. These conflicts can be associated with personal, family and/or community factors, which can interfere at autonomy of individual and/or responsible, influencing them The refusal of vaccine (Sugarman et al, 2017).

Compulsory immunization programs are morally justifiable, as vaccination is considered one of the more effective and cost-effective public health policies used in disease control and prevention, however, it is also one of the most controversial and controversial biomedical techniques, and can result in serious individual reactions. So being, becomes essential The Implementation in biopolitics compensatory, associated The reasoning bioethics, aiming promote a public awareness of moral responsibility, collective solidarity and justice social with children affected (Hsu & Chang, 2019; Lessa, 2013).

Per other side, for some authors, countries with laws proxies how much The use in vaccines as character mandatory, as is the case in Brazil, except for people with medical restrictions, may compromise the principle of autonomy, characterized as the respect for the subject's will, since the mandatory vaccination, deprives him of this right (Souza Of Jesus, et al., 2016).

Refusal of the vaccine by community members and/or religious leaders, requires an important approach from the Care Primary in Health (APS), then are trainers in opinion and influence negatively. The autonomy gives person and/or responsible, consequently, if observe O increase at prevalence in infection fur HBV, making them susceptible. The complications such as Liver Cirrhosis and Hepatocellular Carcinoma. Such situations decrease the patient's quality of life, so how, generate costs lofty to the public health (Hsu & Chang, 2019).

Although the autonomy of children and adolescents is recognized, they constitute a group that deserves attention. after all, they can use this principle in a wrong way, exposing themselves to risky situations that make them susceptible to HBV and others illnesses, in addition addition, some decisions depend of consensus of responsible, O which he can interfere accession gives vaccination (Shepard, et al., 2005).

Another principle of bioethics that may be compromised by the act of mass and/or mandatory vaccination is the of non-maleficence which means avoiding any type of risk, in relation to the safety of vaccine products, such as your correct application and storage, in addition to compromising the principle of justice which aims to resolve issues conflicts related to collective life, by having the imposition of collective benefit as argument for the levies individual (Souza Of Jesus, et al., 2016).

According to Lessa and Dórea (2013), principlist bioethics is not enough or sufficient to analyze the issues ethics associated at actions individual what has impact significant at health collective, as It is O case gives vaccination in pasta in children. conflicts in interests individual and collective, The distribution uneven in scratches versus benefits and The vulnerability of children open ways to the reflection ethics about the current Software of immunization .

Therefore, for bioethicists, the interest of collective health and the protection of the population must prevail over the autonomy of the individual, and it is up to health professionals to comply with the principles of beneficence and non-maleficence, since the cost/benefit of applying the vaccine is at stake, since, on the one hand, the aim is to prevent contagion and, on the other hand, to expose the patient to the side effects, and, from that, bioethics becomes inefficient for the critical analysis in this situation (Pereira, et al., 2018).

Therefore, HBV infection characterizes an important public health problem, which must be widely discussed in association with bioethical principles, developing health actions that can guarantee the autonomy of the individual and/or dependent, so as, exercise the beneficence, non-maleficence and justice (Gaze, et al., 2006).

On the other hand, with regard to access to immunizations, economic factors can be associated with non-compliance of a principle of bioethics which is that of justice, opening space for bioethical discussions on the social vulnerability of the greatest part of the population, who cannot afford these immunizations, when they are not available in the single system in health. (Moura, et al., 2021)

The benefits of vaccines for public health are indisputable, so bioethics can provide reflection and debate capable of understanding the complexity and conflict of the concrete reality so that the country

moves towards a vaccination program that is not only ideal in its epidemiological, social, political and economic aspects, but also what be ethically acceptable, to avoid damage and sufferings in principle avoidable (Lessa & Schramm, 2015).

5 CONCLUSION

With this study, the information on the epidemiological and bioethical approach to the infection by the hepatitis B, recognizing that vaccination against HBV contemplates the bioethical principle of justice and, what evidence scientific studies prove the effectiveness of the aforementioned vaccine, exercising the bioethical principle of beneficence, however, the effects collateral, result in conflicts involving the principle of non-maleficence. These consequences are intensified when are associated with individual and/or collective factors, which may interfere with the individual's autonomy in adhering to such a measure of prevention.

Therefore, The infection fur VHB represents a important problem in health public, needing in planning in health what intensify O investment in activities educational at Heads up Primary in Health, covering The discussion of bioethical principles, which can guarantee the autonomy of the individual and/or dependent, as well as exercise the beneficence, non-maleficence and justice.

In view of this, the authors suggest that further studies be carried out covering the topic in question, for greater comprehensiveness of results, as well as studies with other approaches for better dissemination of the theme, mainly among professionals of health.

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CHAPTER 94

Comparison between osteomuscular symptoms in active and sedentary elderly

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ABSTRACT

With aging, diseases related to the musculoskeletal system tend to appear more frequently: arthritis, osteoarthritis, sarcopenia that result from changes in Activities of Daily Living (ADLs), complications in locomotion to death due to falls. According to DATASUS, hospitalizations and deaths in the elderly aged 60 years and over, in the period from January / 2008 - February / 2016, due to external causes of morbidity and mortality totaled 5,290, burdening public health costs and directly affecting the quality of life of individuals.

1 INTRODUCTION

With aging, diseases related to the musculoskeletal system tend to appear more frequently: arthritis, osteoarthritis, sarcopenia that result from changes in Activities of Daily Living (ADLs), complications in locomotion to death due to falls. According to DATASUS, hospitalizations and deaths in the elderly aged 60 years and over, in the period from January / 2008 - February / 2016, due to external causes of morbidity and mortality totaled 5,290, burdening public health costs and directly affecting the quality of life of individuals.

The elderly emerges from the moment when the organism enters the aging process, which is when physiological, morphological, and biochemical changes appear, also considering psychological changes when the human being adapts to new life situations (SANTOS, 2010).

Conceptualizing the elderly, we can have different points of view considering the location of where they are, whether in developed or developing countries. Thus, the United Nations (UN) conceptualizes the elderly, in Brazil, as being those who are 60 years old or more.

Quantifying in numbers, according to the Brazilian Institute of Geography and Statistics (IBGE, 2008) and considering the concept of elderly people by the UN, 11.3% of the Brazilian population is elderly, a number that according to statistics has tended to grow since 1999 to date the number has grown by more than 2%. Also, according to IBGE, the number of elderly women who have mobility problems (ability to walk 100 meters) is higher than that of elderly people, 15.9% against 10.9%, in compensation the life expectancy of elderly women is higher, 77 years against 69 of the elderly, which makes elderly women more susceptible to inability to move.

The practice of physical exercises can interfere with secondary aging factors, leading to healthy aging, with the advancement of technologies in the health area and the awareness of “good aging”, the elderly population has been growing in the country, see data cited in the topic above, along with life expectancy, which leads to the need to be physically more active, to have greater independence in ADLs, and other daily activities, such as shopping, taking a walk, going to a doctor, among others (NEGRÃO; BARRETTO, 2010).

According to Moreira and Borges (2009), the regular practice of physical activities and the maintenance or acquisition of a good level of autonomy for the performance of activities of daily living, have an important relationship. They conclude that an active lifestyle can delay the impacts generated by the aging process. Keeping the elderly more independent in their daily activities

Recommendations for levels of physical activity according to the World Health Organization (WHO) for this public are 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity, which can also be a combination of moderate and vigorous activities.

Of the most prevalent musculoskeletal pathologies in the elderly:

a) Musculoskeletal degenerative

According to Da Silva (2008), The concept of degenerative osteoarticular disease presupposes an abnormality in the hyaline cartilage, which determines symptoms of variable intensity and impaired function. The clinical picture is called arthrosis, osteoarthritis or, as it is currently preferred, osteoarthritis (OA). Still according to the author above, the main clinical manifestations are pain, joint stiffness and muscle edema. As for the place of manifestation, it differs between the sexes: among men it is more common in the hip region, in women it presents more frequently on hands, knees and feet.

b) Metabolic and musculoskeletal

Coelho (2009) reports that this pathological alteration affects the connective, muscular and bone tissues, generating several manifestations in the osteoarticular system. Among the cases of pain, the causes may not be exclusively due to wear and tear on the tissues that make up these joints and muscles, these can be triggered by systemic diseases (diseases that affect more than one organ or tissue) that manifest with osteoarticular symptoms. Among the metabolic ones that is most associated with the elderly is Diabetes Mellitus, considering the number of elderly people who have the disease.

c) Rheumatic musculoskeletal

Cecil (2011) points out that even though rheumatological diseases have quite different origins, the causes pointed out are frequent immunological disorders leading to local and systemic inflammation. According to Biasoli & Machado (2006), in rheumatological diseases, most complications occur in the joints, the primary joint injuries caused by rheumatism or secondary dysfunctions resulting from an abnormal effort in other structures can cause joint deformities, tendonitis, bursitis, etc. Among the most frequent pathologies, whether they are primary or secondary causes, are spinal dysfunction, osteoarthritis, osteoporosis, fibromyalgia, spondylitis syndromes, rheumatoid arthritis. In that regard

objective of the present study was to compare the prevalence of musculoskeletal symptoms between active and sedentary elderly women.

2 MATERIAL AND METHODS

2.1 STUDY SUBJECTS

The research was carried out with two groups of elderly women, one group composed of active women and the other composed of sedentary women. Both groups of elderly women are in the municipality of Feira de Santana - BA.

The selection criteria were:

- a) Be elderly;
- b) Female sex;

The option for the female sex was since most of the members of projects aimed at this age group are elderly. The age group used in the survey was 60 (sixty) years old or more, with reference to Law No. 10,741, of October 1, 2003, which in Article 1 establishes the Elderly Statute, aimed at regulating the rights of people aged equal to or greater than 60 (sixty) years.

Active elderly women

The active elderly women who took part in the research participated in a water aerobics group with a frequency of two weekly classes, with 60 minutes and should perform any other exercise of at least 30 minutes. In order to comply with the recommendations of the World Health Organization, which provides for 150 minutes of moderate aerobic activity.

Sedentary elderly women

We considered sedentary elderly women who did not comply with the minimum amount of weekly exercise recommended by WHO, which is 150 minutes / week of moderate aerobic exercise or 75 minutes / week of vigorous exercise. These were in an asylum, in which the observed activities were linked to ADLs or recreational activities such as sewing and reading.

Study location

The research was carried out in the municipality of Feira de Santana, Bahia. The questionnaire was applied to a group of elderly women participating in a community water aerobics project (Active Group) and elderly women in an asylum (Sedentary Group) in the city.

Data collect

A Nordic Musculoskeletal Questionnaire (QNSO) questionnaire was applied, a questionnaire that indicates where the individual felt pain or some type of discomfort (tingling, numbness).

Data analysis

Statistical analysis.

Data analysis was performed using descriptive statistics (mean \pm SD), the level of significance was $p < 0.05$ and the statistical package was Stata 10.0.

Ethical aspects

This project complied with Resolution 466/12 of the National Health Council. These data were collected after each volunteer signed a free and informed consent form and approval by the Ethics and Research Committee of the Brazilian College of Systemic Studies (CBES), protocol number 640. CAAE: 0249.0.402.000-09.

3 RESULTS

After data collection in the field, 19 eligible individuals were interviewed according to the inclusion criteria of the research. In the physically active group (n = 9) and in the sedentary group (n = 10).

Table 1 -Prevalence of pain, numbness, musculoskeletal tingling

Anatomical Region	Musculoskeletal Symptoms							
	Sedentary Group				Active Group			
	Last 12 months		Last 7 days		Last 12 months		Last 7 days	
	N	%	N	%	N	%	N	%
Neck	2	20	1	10	1	11	0	0
Shoulders	3	30	2	20	2	22	0	0
Upper back	5	50	3	30	4	44	3	33
Elbow	2	20	1	10	3	33	2	22
Fists/Hands	3	30	2	20	4	44	0	0
Lower back	4	40	2	20	2	22	1	11
Hip/Thighs	3	30	0	0	2	22	2	22
Knees	9	90	4	40	2	22	1	11
Ankles/Foot	0	0	0	0	1	11	0	0

Source: Own elaboration.

In table number 1, we can observe, among sedentary elderly women, that there is a significant number of elderly women who answered yes to pain, numbness or tingling in the last 12 months, with almost all of them showing some kind of discomfort in the knee, in contrast to elbows and neck were the ones that showed less signs of pain prevalence. The only anatomical region that when asked, there was no sign of musculoskeletal symptoms, was the ankle.

Among active elderly women, data for the last 12 months indicate that none of the anatomical regions exceeded 50%, but all of them were flagged with an indication of musculoskeletal symptoms. The greatest sign of pain, numbness or tingling was in the wrist / hand region and in the upper back with 44%.

Bringing the results of both groups for the last 7 days we can observe a drop in the indicative of musculoskeletal symptoms in both populations, however among the active ones we noticed a reduction of the indicated areas, having no indication of symptoms for neck, shoulders, wrists / hands and ankle. Among

the sedentary ones, the mentioned areas remain, when compared to symptoms in the last 12 months, presenting only a reduction in the indicative if musculoskeletal symptoms.

When asked if in the past 12 months they consulted a health professional because of the musculoskeletal symptom indicated in the questionnaire, the index remains above 50%, when correlating the reported symptom and going to the doctor/physiotherapist, in the sedentary group. When we make the same correlation in the active group, we realize that the index is not significant.

Table 2 - Visited the doctor/physiotherapist in the last 12 months due to musculoskeletal symptoms

Anatomical Region	Visited the doctor/physiotherapist			
	Sedentary Group		Active Group	
	N	%	N	%
Neck	0	0	0	0
Shoulders	3	30	2	20
Upper back	4	40	2	20
Elbow	1	10	0	0
Fists/Hands	2	20	1	10
Lowerback	3	30	1	10
Hip/Thighs	3	30	0	0
Knees	7	70	0	0
Ankles/Foot	0	0	0	0

Source: Own elaboration.

When asked about the inability to develop activities of daily living due to the musculoskeletal symptoms indicated in the questionnaire, the number was quite small, being present only among the elderly women belonging to the sedentary group.

Table 3 - Prevention of performing ADLs due to musculoskeletal problems

Anatomical Region	Impediments for doing ADLs			
	Sedentary Group		Active Group	
	N	%	N	%
Neck	0	0	0	0
Shoulders	0	0	0	0
Upper back	1	10	0	0
Elbow	0	0	0	0
Fists /Hands	0	0	0	0
Lower back	1	10	0	0
Hip/Thighs	1	10	0	0
Knees	1	10	0	0
Ankles/Foot	0	0	0	0

Source: Own elaboration.

4 DISCUSSION

Musculoskeletal and connective tissue diseases affect more than 520 thousand people over the age of 60, generating an expenditure of approximately R \$ 733,000 (seven hundred and thirty-three thousand BRL), remaining on average of 8 days hospitalized, according to Datasus (2012). With the growing elderly population, costs tend to increase and facilities that are already insufficient to cover the entire population will become even scarcer. We can thus observe that the current model is inefficient and very expensive, as stated by Da Silveira et al (2013).

Despite not being a direct object of the research, costs with musculoskeletal diseases, in table 2 the sedentary group expresses results that are in line with what is presented in the literature, more than half of the elderly in this group, who indicated musculoskeletal symptoms, sought the service with complaints regarding these symptoms. According to Matsudo (2009), physically active elderly people have improved or maintained muscle mass, muscle strength and bone density, reduced risk of falls and injuries caused by falls and in therapeutic effects, exercise is effective in the treatment of osteoarthritis and in pain management, thus justifying the lower demand for doctors / physiotherapists by the active group.

Even being unable to diagnose the cause of the musculoskeletal symptoms indicated in the applied questionnaire, we found a study that approximates the result obtained in relation to the most affected area, Felipe and Zimmermann (2011) in their study demonstrate that the incidence of osteoarthritis in the knee was 50 %, in our study the incidence among sedentary women was 90% and 22% in the active group. Which also shows conformity with Da Silva (2008), where he mentions that the most affected parts in women are the hands, knees and feet, which can be associated with the type of physical and labor activity practiced.

The study by Campos et al (2012) is in line with the results obtained, even though the research had a younger population of both sexes, the most affected anatomical part was the hip and lower limbs in the sedentary group, which is possible to notice when we saw that the knees were the anatomical part that most indicated symptoms. Another finding made in the research by Campos et al (2012) is that the active group indicated a lower prevalence of musculoskeletal symptoms, in our study it was also observed that in all questions answered by both groups the indication of musculoskeletal symptoms, consultation with physiotherapists / doctors as a result of these symptoms and the suspension of daily activities was lower in active elderly women.

Bobbo et al (2018) in a study with elderly practitioners of Lian Gong and using the QNSO, it was found a very close number of pain reports between sedentary and active, however the active elderly showed a lesser commitment to perform ADLs as well as the reduction in daily use of medicines and a better perception of their own health. Andrade et al (2018) evaluated elderly people who practiced walking and an outdoor gym and found results that go in line with those we found, realizing that all participants obtained a high SF36 score as well as a positive perception of their health status.

When we report on ADLs and quality of life, we perceive a direct relationship with pain, as found by Dellaroza and Pimenta (2012) when 50% of the elderly who reported that pain interfered in their daily

life in a moderate or intense way which makes us correlate with results presented above, where only elderly women in GA presented impossibility to perform ADLs.

The importance of regular physical exercise is not limited to musculoskeletal symptoms, but to the health status of the elderly person in full Cosme et al (2008) states that elderly people submitted to physical exercise programs, in addition to improving physical capacities, mitigates physical losses aging process and improving the age x time of ADL execution, which was shown in Table 3, where we notice that the sedentary group appears with indications of interruption of ADLs due to musculoskeletal symptoms. Borges & Moreira (2009) affirm that there is a decline in functional capacity in active elderly people, but in a slower and less intense way, since in their studies there were no cases of dependence in ADLs.

The benefits brought by regular physical exercise are notorious, Matsudo (2009) lists five categories: anthropometric effects, metabolic effects, cognitive and psychosocial effects, effect on falls and therapeutic effect, all of which bring beneficial qualities to the health of the elderly individual. Esain (2018) observed the negative impacts of physical inactivity after 3 months in elderly people aged 65-90 years, demonstrating negative physical and psychological numbers, reaffirming the importance of physical exercise in physical functions and its impact on ADLs.

Taking into account the data from the National household sample survey continues (PNAD continues) (2017), we noticed an increase in the elderly population exceeding 30 million, when observing the data from VIGITEL (2018) we can see that most of these elderly people, around 60 % of those over 65 years old, are in the overweight range, which can lead to overload and joint pain, reduced performance of ADLs and demand for health services, directly impacting quality of life. Lopes MA et al (2016) demonstrates the various causes that directly impact the adherence or not of physical activities, among them is over-protection of the family, carrying out daily activities and physical limitations due to illnesses.

Da Silveira (2013) indicates that health promotion, health education actions, disease prevention and retardation of diseases and weaknesses and the maintenance of independence and autonomy will enable a higher quality of life for the elderly. Due to the low number of active elderly women found to participate in the research and the difficulty in finding regular physical exercise groups for the elderly in the city where the research was carried out, there is a much more culture of treatment than prevention and promotion of health, which directly inferred from the results obtained, where we observed that when there is the presence of a preventive factor, the numbers of treatment or impediment to daily activities are reduced.

De Souza (2011), in his study, warns of diseases of the musculoskeletal system and connective tissue that appears as the second cause that most bothers the elderly, among those cited by the elderly are arthrosis, arthritis, rheumatism and spine disease, it is still A warning was raised about the growing of these diseases, becoming a public health problem. As the results show that the sedentary group has a higher prevalence of musculoskeletal symptoms, when compared to the group that is associated with physical exercise.

The National Health Promotion Policy (PNPS) of 2018, visualizing the importance of physical exercise and body practices, in article 10 defines priority themes for health promotion actions and in item III is:

III- bodily practices and physical activities, which includes promoting actions, counseling and dissemination of bodily practices and physical activities, encouraging the improvement of the conditions of public spaces, considering the local culture and incorporating games, games, popular dances, among other practices

Thus, compacting with what was observed in the result of the study, which points out that physical exercise is a variable to be considered in improving the quality of life and health levels, which ends up having an impact when we compare the difference in musculoskeletal symptoms indicated in the active group. and sedentary.

5 CONCLUSION

We conclude that the present study is in agreement with the existing literature, demonstrating that the practice of regular physical exercise is an important variable to be considered in the context of the prevalence of musculoskeletal symptoms in elderly women in a more general way should be taken into account as an accessible factor and low cost for health promotion and prevention, especially in groups at risk, and thus can also be used as a policy to reduce public spending on health.

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CHAPTER 95

Contribution of peer instruction in the understanding of knowledge in morphology classes for medical students

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ABSTRACT

The objective will be to analyze from the literature how the Peer Instruction (PI) technique can increase the performance and understanding of students in morphology classes. Qualitative, exploratory, and interventionist research. The research will be in the morphology classroom, at the Faculty of Medicine - Integrated University Center, Campo Mourão - PR. Students will be in the sixth period of medicine. The estimated sample will be 80 students. Initially, an expository class will be administered with the help of

PowerPoint, and after applying questions based on clinical cases regarding the subject already taught, by the Socratic Student platform. Students will answer the multiple choice questions individually, after discussing among themselves why they chose this alternative without knowing the correct answer. The same will be reapplied to evaluate the income gain. Data collection will be carried out through a questionnaire. The questions will be open for participants to express themselves freely. For the analysis, the Iramuteq software will be used. The IP has been adopted as an alternative for collaborative learning, being considered a teaching method that aims at greater interaction between students during classroom discussions, providing a space for arguments and relationships between students. In this perspective, the diversity of results found shows that the IP is a highly recommended proposal, especially when seeking to engage the student in the learning process. It is believed that the PI can be a timely intervention to develop skills and abilities during morphology classes.

Keywords: Peer Instructions, Active Methodology, Teaching-Learning

1 INTRODUCTION

The active methodology has received considerable attention in recent years. It has attracted strong advocates, among them, teachers looking for alternatives to traditional teaching methods. This expression "active learning" is recognized as an approach to the classroom, where the teaching method is planned to teach students during the learning process, making it the main element in the search for knowledge, in contrast to traditional teaching, characterized by eminently exhibition classes. (Prince, 2004)

Currently, there is a growing active search, by educational institutions, for innovative methods in undergraduate courses, enabling students to develop a critical, reflective, and ethical pedagogical practice. Thus, there are several discussions about active methodologies that can encompass different practices, to increase the student's attention and curiosity to grant an essential learning (Garcia et al., 2019)

In observation of the teaching of higher education, Emmel and Krul (2017), in addition to seeking integration between teaching and teacher education, point out that university teaching and its domains are revealed in pedagogical relations and the problematization of practices. In order to increase engagement in knowledge, due to the exchange of experiences through the search for knowledge, sharing ideas among

peers, bringing the formation of a critical and reflective thought, considering divergent opinions. The active exchange of ideas in small groups in addition to increasing interest, also promotes critical thinking.

One of the alternatives used to try to change medical education has been the inclusion of *Peer Instruction* (PI) or Peer Instruction (Garcia et al., 2019). *Peer Instruction* has been adopted as an alternative for collaborative learning, which can be defined as instruction or peer learning, being considered a teaching method that aims at greater interaction between students during classroom discussions, providing the ability to actively engage students during the learning process, in addition to developing social and cognitive skills. (Crouch et al., 2001).

It is known that it is necessary to innovate in the teaching process – learning, so that it becomes more interactive, attractive and practical during learning, facilitating the acquisition of knowledge, involving the student in order to develop skills and reasoning. On the other hand, the student's perception has rarely been evaluated for the choice of the methodology to be applied.

In the course of medicine, the discipline of morphology is inserted from the first year, and until the fourth period this discipline has a more conceptual view and from this begins to have a focus with more problematizations, with the purpose of stimulating students to the intimate relationship between concepts and clinical practice so that there is understanding and connection of pathophysiology, diagnosis and therapy.

In view, considering that the formulation of hypotheses and problem solving is one of the competencies necessary for the graduate of the medical course, it is of paramount importance to evaluate the perception of the student in relation to the methodology applied in the teaching process - learning.

In the midst of the diversity of existing active methodologies, it is feasible to choose the most appropriate to the course stage. The use of problematization processes, case analyses and project-based learning provide better implications for training in more advanced stages of the course, while in the initial semesters demonstrations, classroom discussions, presentations, conceptual and mental schemes are more pertinent (Oliveira et al., n.d.)

Peer Instruction is an active teaching-learning methodology that helps teachers quantify, in real time, students' understanding and understanding of the topics presented in the classroom. Thus, both the student and the teacher will be *able to obtain immediate feedback* about the learning on a particular topic taught in class (Crouch et al., 2001).

This methodology, also known as Peer Instruction (IpP), which provides greater interactivity in the classroom, was developed by Professor of Physics Eric Mazur, Harvard University (Müller et al., 2017). Since its creation in the 1990s, IpC has been presenting relevance in the international teaching method due to its ability to facilitate development, cognitive skills and means of interaction, with a positive impact on the teaching- learning process (Müller et al., 2017; Crouch et al., 2001).

Brito & Campos, 2019 conducted a study in the area of Physical Education, in which a gain in income was observed after the application of the collaborative methodology – Peer Instruction. In the

authors' perception, this satisfactory performance confirms the understanding of the concepts necessary for learning for the knowledge of a future professional, and it was also noted that this income is associated with collaborative participation in pairs.

As evidenced in the research dissertation of Meirelles, 2020, in the medical course, in the classes of Clinical and Therapeutic Skills at the Faculty of São Caetano do Sul, after the application of the collaborative methodology – Peer Instruction, there was a satisfactory performance and an improvement in the understanding of the concept after collaborative participation among peers.

This circumstance highlights the importance of health education actions as an integrative strategy of a collective knowledge that translates in the individual its autonomy and emancipation. (Machado et al., 2007).

Valente (2014), setting out examples of the introduction of Project-Based Learning (ABPP) and Problem-Based Learning (BPA) indicates difficulties in applying these methods, with numerous classes. These problems can be repaired with the introduction of Information and Communication Technologies (ITCs) in classrooms, configuring Hybrid Teaching (*Blended Learning*), that is, merging the online resource with face-to-face activities for the implementation of the active methodology (Brito & Campos, 2019).

In this perspective, it is believed that the *collaborative strategy, called Peer Struction*, may be a necessary intervention to develop skills and abilities during morphology classes. In this way, we will conduct this study, with the objective of analyzing how the IP technique can increase the performance and understanding of students during morphology classes.

2 METHODOLOGICAL PROCEDURE

Field research allows the understanding of how students in the sixth period of the morphology class will have a greater understanding of knowledge. application of the adapted Peer Instruction technique. On this type of research, Gonsalves (2001 *apud* Piana, 2009, p. 169) pronounces:

Field research is the type of research that aims to search for information directly with the population surveyed. It requires a more direct encounter from the researcher. In this case, the researcher needs to go to the space where the phenomenon occurs, or occurred and gather a set of information to be documented [...]

The information will be collected using *Google Forms*, and the research subjects will be students of the sixth period of the morphology course, of the Medical Course of the Integrated University Center of the city of Campo Mourão - Paraná. With this in mind, the approach used will be qualitative:

Qualitative research answers very particular questions. She worries [...] about a level of reality that cannot be quantified. That is, it works with the universe of meanings, motives, aspirations, beliefs, values and attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reduced to the operationalization of variables (Minayo, 1994 *apud* Chiapetti, 2010, p. 144).

This approach will be carried out from an exploratory perspective, with a view to closer approximation with the reality of the subject under study. According to Gil (2008, p. 27), "exploratory research is developed with the objective of providing an overview, of an approximate type, about a given fact".

When the researcher goes to the field, he has a personal perspective of the problem, as well as references from a theoretical survey conducted before his going. This brings it closer to the problem studied, giving it a foundation and sometimes completing existing gaps. However, when talking to the research subjects, the researcher's perspective is usually altered, forming a new vision or complementing the existing one.

In this sense, exploratory research often leads the researcher to the discovery of new approaches, perceptions and terminologies for him, contributing to his gradually his own way of thinking being modified. This means that it progressively adjusts its perceptions to the perception of the interviewees. In other words, he is able to control, almost imperceptibly, his personal bias (Piovesan et al., n.d 1995, p. 321).

The instrument used for data collection will be a questionnaire. According to Gil (2008, p.121), "one can define a questionnaire with the research technique composed of a set of questions that are submitted to people with the purpose of obtaining information about knowledge, beliefs, feelings, values [...]".

2.1 FIELD

This study will preferably be carried out in person, being transferred online through the Google Meet platform if a new government decree that does not authorize face-to-face meetings occurs. The research field will be in the morphology classroom once a week at the Faculty of Medicine - Integrated University Center, located in the city of Campo Mourão, Paraná.

2.2 SUBJECTS

The population will be students of the sixth period of the medical course enrolled regularly at the Integrated University Center, in the city of Campo Mourão, Paraná. The estimated sample number will be 80 students, however it will depend on the number of adherence to students who will fill out the Free and Informed Consent Form (TCLE), which will be delivered at the first meeting and will be filled out in person. Initially, an exhibition class with the aid of the power point will be administered, and subsequently applied questions based on clinical cases related to the subject already taught, by the Socrative Student platform. Students will answer multiple choice questions at first individually, and will be given time to discuss among them why they chose such an alternative without knowing the correct answer. They will be reapplied to assess the income gain.

2.3 PREPARATION OF THE INSTRUMENT

Data collection will be performed through a questionnaire elaborated by the researcher. The construction of this instrument followed some procedures, with a view to giving it greater reliability.

For the elaboration of the questions, the researcher based on the bibliographic reference. From it, the following themes were established, chosen to meet the research objectives: Thyroid Hormones, Hyperthyroidism and its Pathophysiology, Peer Instructions (Chart 1). Questions will be opened so that participants can express themselves freely, allowing a better exploration of the answers.

Table 1: Script of questions (Questions) organized from its themes and its objectives.

Temas	Objetivos	Questões (Elas devem ser inseridas no <i>Socrative</i> ou em outro software para realização do Quiz)
Hormônios Tiroidianos	Compreender a fisiologia da formação dos hormônios tiroidianos	Você saberia explicar a fisiologia da formação dos hormônios tiroidianos e aplicar este conhecimento em situação real, ou seja, em contextos na área da saúde? Tente explicar a partir de um exemplo prático A partir da estratégia utilizada em sala de aula pela professora, nos dois momentos (individual e em pares), você poderia dizer que ela auxiliou na compreensão do tema (Hormônios Tiroidianos)? Tente explicar a partir de um exemplo, que aconteceu com você, assim como os seus colegas na tentativa de responder as questões
Hipertireoidismo e sua Fisiopatologia	Compreender a Fisiopatologia do Hipertireoidismo Identificar um quadro clínico de Hipertireoidismo Verificar como se faz uma condução básica no caso do Hipertireoidismo	Você saberia explicar a fisiopatologia do Hipertireoidismo e aplicar este conhecimento em situação real, ou seja, em contextos na área da saúde? Tente explicar a partir de um exemplo prático Como você poderia identificar um caso clínico de Hipertireoidismo? Tente descrever a partir de uma situação prática Você seria capaz de realizar uma condução básica no caso de Hipertireoidismo após a aula de Doenças da Tireoide? Descreva a partir de um exemplo
Instruções por Pares	Identificar como a técnica PI pode favorecer o processo de ensino e da aprendizagem Identificar como a participação entre os pares pode definir o processo de aprendizagem de um determinado conteúdo	Você saberia dizer se a estratégia utilizada em sala de aula (Peer Instruction) foi interessante para aprender o conteúdo da matéria? Explique a partir de um exemplo prático Você saberia identificar quais são as vantagens da técnica Peer Instruction no momento da aprendizagem de um determinado conteúdo? Dê um exemplo, caso possa facilitar na sua explicação Você acredita que a participação entre os pares, utilizado na técnica Peer Instruction, poderia melhorar o seu desempenho em situações reais da sua prática profissional? Tente explicar a partir de um exemplo

Source: Prepared by the author.

The exploratory study allows, therefore, to combine the advantages of obtaining the qualitative aspects of information with the possibility of quantifying it later. This association is carried out at

the level of complementarity, making it possible to broaden the understanding of the phenomenon under study (Piovesan et al., n.d; 1995, p. 322).

The questionnaires will be extracted *from Google Forms* and saved in *Word*, ensuring the registration of the information, to analyze the collected data.

2.4 ANALYSIS PROCEDURE

Once the *Google Forms questionnaires have been extracted and converted into Word files*, you will perform an analysis in which the data obtained and the theoretical framework collected were related. It is based on the methodology of content analysis, in which categories are created for data interpretation:

Content analysis is a technique of analysis of communications, which will analyze what was said in the interviews or observed by the researcher. In the analysis of the material, we seek to classify them into themes or categories that help in understanding what is behind the discourses. (Silva & Fossá, 2015, p. 2).

Thus, after the questionnaires will be saved, it will perform the exploration of the collected material. The text of the answers will be encoded, considering clippings of the text as units of record. According to Franco (2008), the units of record can be considered through words, themes, characters and/or items. After the design of the registration units, the "establishment of categories that differ thematically in the units of record (passage of raw data to organized data)" (Silva & Fossá, 2015, p. 4).

Thus, the text of the interviews is cut into units of record (words, sentences, paragraphs), grouped thematically into initial, intermediate and final categories, which allow inferences. Through this inductive or inferential process, we seek not only to understand the meaning of the interviewees' speech, but also to seek another meaning or another message through or with the first message. (Silva & Fossá 2015, p. 4).

The categories will be created after the interviews, because, in this way, they emerged based on the contents of the answers, discourses and analysis of the collected material (Franco, 2008).

The formulation of these categories follows the principles of mutual exclusion (between categories), homogeneity (within categories), pertinence in the transmitted message (non-distortion), fertility (for inferences) and objectivity (understanding and clarity). (Silva & Fossá 2015, p. 4).

In order to assist in the creation of registration units and, consequently, of categories, it will *use* the Iramuteq software, in which the obtained data were processed.

This computer program enables different types of textual data analysis, from very simple ones, such as basic lexicography (word frequency calculation), to multivariate analyses (descending hierarchical classification, similitude analyses). It organizes vocabulary distribution in an easily understandable and visually clear way (similarity analysis and word cloud). (Camargo & Justo, 2013a, p. 515).

The *software* offers five possibilities of analysis. In this research we intend to use the Descending Hierarchical Classification Method (CHD), which

[...] represents in a Cartesian plane the different words and variables associated with each of the CHD classes. The interface allows the retrieval, in *the original corpus*, of the text segments associated with each class, when the context of statistically significant words is obtained, enabling a more qualitative analysis of the data. ((Camargo & Justo, 2013a, p. 516).

3 RESULTS AND DISCUSSION

Active methodologies have received considerable attention in recent years. They have attracted strong advocates, among them teachers looking for alternatives to traditional teaching methods. This expression "active learning" is recognized as an approach to the classroom, where the teaching method is planned to teach students during the learning process, making it the main element in the search for knowledge, in contrast to traditional teaching, characterized by eminently exhibition classes. (Prince, 2004)

The learning process is complex and involves internal factors of physiological and psychological interactions and interaction with the external environment. It covers the habits that the subject forms with the assimilation of social and cultural values, to which he has access during the socialization process. It is, therefore, to face external demands of a social nature, mobilizing the subjects to develop answers that satisfactorily meet such demands. (Piovesan, et al 2018)

By relating to people and objects, the human being forms bonds and develops different ways of knowing and learning, based on both individual and collective experience. Such experiences are capable of constructing learning models that are elaborated and modified based on interactions with objects of knowledge, with others and with themselves. (Piovesan, et al 2018)

All of us, in our daily relations of development and action, work considering the three main theories about the learning process: (I) inattista, (II) environmentalist and (III) interactionist. (Peres et al, 2014)

For the inatist theory of knowledge, the focus of learning is the subject himself. The concept is based on the idea that genetic and maturational factors define what constitutes a human being, that is, learning happens from the inside out. Thus, the role of the school and the teacher is to favor the expression of innate characteristics, however educational success depends on the characteristics brought by people (Peres et al, 2014).

In the opposite way to environmental theory, it attributes to the environment the constitution of human characteristics. It values the role of the teacher and considers that learning occurs through the transmission of information. Teachers are at the heart of this process, and should be great connoisseurs of the issues to be addressed and responsible for the transmission of information to students. (Peres et al, 2014).

For interactionist or constructivist theory, the focus is on the processes of knowledge, that is, on the interaction between the subject who learns and the object, both hereditary factors and contents, culture and society interact in learning. People are the subjects who actively seek information. Teachers guide the learning process, acting as a facilitator and mediator of knowledge between subject and object. (José Alencar Gomes da Silva Minister of State for Education Fernando Haddad Secretary of Special Education Claudia Pereira Dutra Rector of the Paulista State University - et al., n.d)

Thus, the teacher acts as a facilitator of knowledge, a mediator between subject and object, guiding the teaching-learning process. The internal motivations, previous knowledge, the active and collaborative posture of the students along with the direction of teachers in the search for new knowledge collaborate with the process of learning construction.

In line with the National Curriculum Guidelines, 2014, which states that the medical course should have its pedagogical project built collectively, centered on the student as a subject of learning and the teacher only a facilitator and mediator of the teaching-learning process. And describes in article 29, as structuring the course, the following: *Use methodologies that privilege the active participation of the student in the construction of knowledge and integration between the contents, ensuring the indissociability of teaching, research and extension (Brasil, 2014, pag 4)*. And again to emphasize in Article 32: *The Undergraduate Course in Medicine should use active methodologies and criteria for monitoring and evaluation of the teaching-learning process. (ibid)*

A qualitative study conducted by Ribeiro et al (2016) evaluated how the active methodology has reflected in the teaching - learning process, analyzing the potentialities and limitations of this new teaching method within the context of academic activities developed during medical graduation. Exploring the students' perspective, it was observed that most of the participating students see the active methodology as an excellent teaching strategy, being superior when compared to the traditional teaching methodology.

Thus, the student must be the protagonist of his learning, in this sense he must be removed from his passivity and encourage him to seek information for the construction of his own knowledge. This fact would not occur so easily if the student was passive in this process, only as a receiver of information passed on by the professors. (Oliveira et al., n.d.)

The students, when searching in the bibliography for the subjects for the construction of their knowledge throughout the undergraduate course, promote them as a researcher, facilitating the construction of skills such as creating, investigating, criticizing and reflecting (Andrade & Vieira, 2012).

Carvalho and Santos, 2022, conducted a qualitative study on the Perception of Academics with traditional and active methodologies in the Teaching of Chemistry for Agrarian Sciences at the State University of Mato Grosso - Campus Sinop. Scientific evidence shows a gain in the construction of learning with the use of active methodologies, and even a preference of 66.7% of students for the active method, in which they presented a greater success in learning with the application of the Active Methodology.

As evidenced by Garcia et al (2019), in a qualitative work, with 50 students from the second and final year of the nursing course, about the perception of students in the construction of knowledge in the context of active methodology, which positively assists in the development and construction of knowledge.

Active methodologies have the potential to arouse curiosity, as students engage with the search for knowledge and bring new elements, not yet considered in classes or in the teacher's own perspective, bringing engagement, perception of competence and belonging, in addition to persistence in studies. (BERBEL, 2011).

In the midst of the diversity of existing active methodologies, it is necessary to choose the most appropriate to the course stage. Demonstrations, classroom discussions, presentations, conceptual and mental schemes are relevant in the initial semesters, while in the other semesters the use of problematization processes, case analysis and project-based learning provide better implications for training (Oliveira et al., n.d.).

There are several discussions about active methodologies that can encompass different practices, with the aim of increasing the student's attention and curiosity to grant essential learning. One of the alternatives used to try to change medical education has been the inclusion of Peer Instruction (PI) or Peer Instruction (Garcia et al., 2019).

Peer Instruction is an active teaching-learning methodology that helps teachers quantify, in real time, students' understanding and understanding of the topics presented in the classroom. Thus, both the student and the teacher will be *able to obtain immediate feedback* about learning about a particular topic taught in class (Crouch et al. 2001).

This methodology, also known as Peer Instruction (IpP), which provides greater interactivity in the classroom, was developed by Professor of Physics Eric Mazur, harvard university (Müller et al., 2017). Since its creation in the 1990s, IpP has been presenting relevance in the international teaching method due to its ability to facilitate development, cognitive skills and means of interaction, with a positive impact on the teaching-learning process (Müller et al., 2017; Crouch et al., 2001).

Peer Instruction has been adopted as an alternative of collaborative learning, which can be defined as instruction or learning by peers, being considered a teaching method that aims at greater interaction between students during classroom discussions, providing a space for arguments and relationships between students (Crouch et al., 2001).

IP has been used in various research themes, in the areas of medical sciences, humanities and exact. Rao and Di Carlo apud Muller (2017) evaluated the impact of interaction between colleagues on student performance in conceptual issues in a Physiology course for medical students. The questions answered by the students were categorized as: comprehension, application and analytical skills; in the three categories there was a statistically significant increase in the score of students after discussion with colleagues: 94% to 99%, 82% to 99% and 73% to 99% respectively. (Müller et al., 2017).

We can verify in Garcia et al. (2019) that, when conducting a research with 30 volunteer students of the Medical course, evaluating their perception in biochemistry classes and observed results that showed correct 67% (before the group discussion) at the initial moment of the activities and, after applying the technique, observed about 100% (after the group discussion) in the performance.

Müller et al. (2017) in a systematic review of the literature, according to the implementation of the active peer instruction (PI) teaching methodology from 1991 to 2015 evaluated the impacts that ip has produced on student learning. The diversity of results found shows that IP is a highly recommended

proposal, especially when seeking to engage the student in the learning process, as well as improve their learning outcomes.

In view, considering that the formulation of hypotheses and problem solving is one of the competencies necessary for the graduate of the medical course, it is of paramount importance to evaluate the perception of the student in relation to the methodology applied in the teaching process - learning.

Pereira and Afonso (2020) conducted a quantitative research, in which 24 students of the Physiotherapy course in the discipline of morphological and physiological sciences about their general perceptions about peer instruction, and obtained positive results, it was found that, in their perceptions the methodology helped them to study individually the contents and practice skills such as teamwork and argumentation, reinforcing the importance of active methodologies in the teaching-learning process and in the training of students with a critical and reflective profile.

Data obtained from the researches carried out by Mazur (2012) indicate that, with the use of the Peer Instruction methodology, the level of information retention by students during classes has a variation in the percentage initially calculated from 20% - only using traditional exhibition classes - to a percentage of 60% from the application of this methodology.

Godoi and Ferreira (2016) in a quantitative and qualitative study conducted by the Salesian University Center of São Paulo - UNISAL, on the application of Peer Instruction in Higher Education, evidence positive points and difficulties encountered in the application of the method.

On the positive aspects, an evolution of students' performance is shown after the impact of the application of the Peer Instruction methodology. In relation to the difficulties encountered, they point to the following aspects: (I) a greater volume of work in the preparation, application and evaluation of activities by teachers; (II) challenges involving the question of how to deal with the low interest of some students, as well as the lack of conceptual "basis"; and (III) issues related to logistical and technological difficulties involving the tools that support the methodology.

Although the active teaching methods are related to a greater effectiveness of the learning process in health courses, students face difficulty adapting to the method due to a culture of exhibition classes implemented in the country since basic education. Where a teacher exposes the content and the student only passively receives and reproduces the information (FERREIRA; MOROSINI, 2019)

Authors such as Berbel (1998), Bordenave and Pereira (1985) argue that the teaching-learning process should not be restricted exclusively to a single methodology. It should be sought to extract the best that each method is able to offer and enjoy the potential of both, prioritizing the effective construction of knowledge.

4 FINAL CONSIDERATIONS

It is known that it is necessary to innovate in the teaching process – learning, so that it becomes interactive, attractive and practical during learning, facilitating the acquisition of knowledge, involving the student in order to develop skills and reasoning. Thus, the diversity of results found shows that IP is a highly recommended proposal, especially when seeking to engage the student in the learning process, since the engagement provided by the IP makes students more responsible for their learning throughout the disciplines, facilitating understanding and interaction, as well as the exchange of ideas among students, improving your learning outcomes.

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CHAPTER 96

Mechanical properties of ecological bricks formulated with civil construction waste

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ABSTRACT

The soil-cement bricks, better known as ecological bricks represent an alternative fully in line with the

guidelines of sustainable development because they require low power consumption in the extraction of raw materials, exempt the firing process and reduce the need for transport once the bricks are produced with the floor of the work site itself. The aim was to evaluate the use of construction waste in the production of ecological bricks. The bricks were manufactured basically by a mixture that consisted of soil, cement, and different percentages of construction waste. The results were compared with current standards. Although the dosages of the bricks produced do not achieve the compression strength values required by NBR 10834 (1994), the addition of construction waste significantly improved characteristics of the same, both the water absorption, since only the witness received no the rate expected by NBR 10834 (1994), and the mass loss, all met the standard that is below 5%.

Keywords: Soil cement. Environmental sustainability. Resistance to compression

1 INTRODUCTION

That civil construction is the branch that provides the most employability, this is undeniable, but what the majority of the population does not know is that in construction, the amount of waste left is about five times greater than the amount of products, making with this branch becoming the center of discussions. For companies that bet on a more sustainable construction, research shows that the immediate cost is 5% higher than the normal cost, but the savings generated in the long term can reach up to 30%, in addition to helping nature (NETO, 2014).).

Soil has been the most used material in civil construction since the earliest times, as it has good thermal and acoustic insulation, is low cost and is very abundant. Studies indicate that the first record of stabilized earth, earth mixed with ash and molded into adobe are from 4,500 BC and were found in the region of Tépé Gawa (PEREIRA et al., 2010).

This context makes new materials, or even high performance materials, and more efficient construction systems the main objectives in the attempt to establish a healthy relationship between low cost and quality of our works without neglecting the culture, the reality of consumption and the limits of manpower.

Soil-cement bricks, currently better known as ecological bricks, according to Grande (2003) represent an alternative in full harmony with the guidelines of sustainable development, as they require low energy consumption in the extraction of raw material, do not require the burning process, thus reducing the emission of carbon dioxide to the environment, in addition to reducing the need for transport, since the bricks can be produced with the soil at the construction site itself.

The soil-cement brick according to NBR 8491/1994 is one that has 85% of its volume consisting of a homogeneous mixture of soil, Portland cement, lime, water and any additive in proportions that meet it. According to the Brazilian Association of Portland Cement, soil-cement was initially used for paving roads (PEREIRA et. al., 2010 apud ABPC, 1986).

To manufacture “normal” bricks, that is, ceramic blocks that use firing for curing, a large part of “fat” clay is used in the manufacture with a small part of “lean” clay to homogenize the mass. The “fat” clay has a high plasticity index, on the other hand, the lean clay has a low plasticity index due to the large amount of quartz, in addition to a greater granulometry than that of the fat clay (MOTTA et al., 2001). In some shipments, when the lean clay does not meet expectations to homogenize the mass, it is necessary to use a kind of additive to make the correction in the mass. This additive is called chamotte, which is nothing more than the ceramic residue burned and rejected from the process; for this case, a range of 5 to 10% is used (Manfredini & Schianchi, 2009).

For the soil-cement brick to be characterized as a quality product, it must meet the requirements of NBR 8491/1984 with regard to dimensions and respective tolerances, compressive strength and water absorption, so it can be made available to the consumer market.

One of the most important characteristics that ecological bricks have to demonstrate is their compressive strength. According to (SOUZA, et. al., 2011 apud FUNTAC, 1999) the greater the increase in the Portland cement content in the soil-cement brick paste, the greater its resistance, being possible to obtain a resistance of up to 2.8 MPa, by adding 10% of it.

Research and development projects dedicated to the manufacture and study of these bricks have gained space and their diffusion in the civil construction market is starting to grow. Ecological bricks are currently sold at prices quite similar to burnt clay bricks, in addition to having the environmental preservation factor associated with their purchase.

According to (OLIVEIRA et al., 2014 apud TAVEIRA, 1987), in addition to the many advantages, ecological bricks benefit from: i) they do not provide conditions for proliferation and housing for insects harmful to health, due to their smooth finish ii) they provide a construction clean, where waste can become future ecological bricks. iii) increases structural strength, and functions as a thermal and acoustic system. iv) if the bricks are manufactured with holes, they do not need conduits for electrical and hydraulic installations. v) reduction of up to 80% in the use of cement, among others.

The objective of this article is to show that with the exorbitant amount of waste from civil construction, something useful can be done with such waste, in addition to providing cleaner buildings,

which are buildings with a seal of sustainability, in addition to evaluating the use of these waste from the civil construction in the production of ecological bricks. Contributing an alternative for recycling these wastes and reducing the environmental impact of buildings promoting sustainable development.

2 MATERIALS AND METHODS

In order for the mechanical properties to be fully evaluated, we selected a company from the central region of the state of Goiás, where it collects stationary buckets with construction waste and transports it to its patio, in the Agroindustrial zone of Aparecida de Goiânia - GO. .

As soon as the raw waste arrives in the yard, it undergoes a “gross separation”; which is nothing more than the removal of the Class B, C and D material and after that it is placed in the crusher, as shown in Figure 01. The materials resulting from this process are classified as: i) crushed stone 02; ii) crushed stone 01; iii) crushed stone 0; iv) coarse sand; and v) medium sand.

As it is soil-cement bricks, type v residue was used, which is the classification for medium sand; so all construction waste was provided free of charge by the company RENOVE.

For the manufacture, the company TIJOLEKO, based in Anápolis-GO, provided its space, press and some instruments necessary for making them.

Figure 01 - Material removed in loco



Source - Authors' collection

According to NBR 10832 - Solid soil-cement brick, it was used in the manufacture of the same, basically a mixture consisting of soil removed from the vicinity of the industry in Anápolis-GO, Portland Cement type CP V - ARI, and as an additive , different percentages of construction waste (0%, 10%, 20%, 30%, 40%, 50%), duly calculated. The amount of portland cement was set at 10% for each of the types set.

As described above, the tests strictly followed the current technical standards, and the samples with the following nomenclatures were used:

- A - Soil + 50% waste + 10% Portland Cement;
- B - Soil + 40% waste + 10% Portland Cement;
- C - Soil + 30% waste + 10% Portland Cement;

- D - Soil + 20% waste + 10% Portland Cement;
- E - Soil + 10% waste + 10% Portland Cement;
- X - Soil + 00% waste + 10% Portland Cement.

Before mixing, the components were passed through a 200 mm sieve, in order to break up small clods present in some materials; after this process, the cement, soil, civil construction residues are gradually added, and a rigorous manual homogenization is carried out until acquiring a uniform color ; at the end of the homogenization stage of the dry materials, the drinking water was gradually introduced and a new homogenization was carried out, until the mixture acquired a crumbly appearance.

The mixture needs to have the appearance of farofa, since for the manual press it is not possible to press the dry material, nor too wet. In the first case, the ceramic block would not be pressed and would fall apart as soon as the form was removed; and in the other case, it would turn to clay and not be pressed.

The mixture, as described above, is contained in NBR 10833 (2012) and was taken to the manual press where the pressing was done in molds. All manufactured elements, as shown in Figure 02, were stored in an area for curing and kept moist for 07 days, so that there was no dehydration.

Figure 02 - Molded and pressed bricks



Source - Authors' collection

After curing, the molded bricks were transported to the soil laboratory at Universidade Paulista – UNIP. The duly cured specimens were submitted to the Compression Resistance test, following the standard of NBR 8492 (2012), which prescribes the methods that must be used in the tests for solid bricks; The tests were carried out after 40 and 80 days of curing in the hydraulic press of the Soil Laboratory of Universidade Paulista.

NBR 8492 (2012) describes the methods to be performed for the tests to be validated:

4.3. Simple compression test

4.3.1. From each sample, seven specimens must be prepared as follows:

a) cut the brick in half, perpendicular to its greatest dimension;

b) superimpose the two halves obtained and the cut surfaces inverted on their larger faces, bonding them with a thin layer of pre-shrunk Portland cement paste (rest for approximately 30 min), 2 mm to 3 mm thick and wait for the paste to harden. The strength of the cement paste cannot be less than that of the brick under test;

...

4.3.3. After hardening of the material used, the specimens must be identified and immersed in water for at least 6 hours.

4.3.4. The specimens must be removed from the water immediately before the test and superficially dried with a slightly damp cloth. This operation must be carried out in a maximum of 3 min.

...

4.3.6. The specimen must be placed directly on the lower plate of the compression testing machine, so that it is centered in relation to it.

4.3.7. Load application must be uniform and at a rate of 500 N/s.

4.3.8. The load must be gradually increased until the rupture of the specimen occurs. ABNT NBR 8492 (2012, p. 6-7).

Therefore, following the NBR above, all the specimens that should be tested by the compression method were cut, and after that, Portland cement paste was inserted between the two halves of the blocks, as shown in Figure 03 .

After curing the Portland cement paste , the glued bricks were immersed in water for 24 hours as can be seen in Figure 04.

Figure 03 - Bricks resurfaced with portland cement paste



Source - Authors' collection

Figure 04 - specimens immersed in water for 24 hours



Source - Authors' collection

Continuing the compressive strength test, the specimens were removed from the water (Figure 05), dried and taken to the hydraulic press until they were broken, as shown in Figure 06.

Figure 05 - specimens removed from the water to go to the hydraulic press



Source - Authors' collection

Figure 06 - Broken specimen in the hydraulic press



Source - Authors' collection

The water absorption test was also carried out in accordance with NBR-8492 (2012), where the bricks were dried in an oven at a temperature of 110 °C for 24 hours as shown in Figure 07 and weighed

after the temperature of the specimen was identical. at room temperature, thus acquiring the mass value M1

After the bricks were at room temperature, they were immersed for 24 hours in water as shown in Figure 08, from where they were removed for further weighing after being superficially dried, thus acquiring the value of mass M2.

To calculate the respective absorption values, we have the following equation:

$$A = \frac{M2 - M1}{M1} \times 100$$

Being:

M1= mass of kiln-dried brick;

M2= mass of saturated brick;

A= water absorption, in percentage.

Figure 07 - specimens positioned in the oven



Source - Authors' collection

Figure 08 - submerged specimens after being removed from the oven



Source - Authors' collection

NBR 8692 (2012) requires only these two tests, but one more test was performed concerning the loss of mass by immersion. This trial was performed in accordance with the guidelines of ME 26 – IPT/BNH.

The specimens used for the aforementioned test were the same used for the absorption test, evidently taking due care, such as: the specimens are placed in the oven (Figure 07), after the specimens are removed from the study, were immersed in still water without any part coming into contact with the surfaces of the container, (except the lower part where the block is supported) care was taken so that the water was at least 10 cm above the specimen.

In the same way as in the previous test, the bricks remained submerged for 24 hours, after which the percentage of the brick was collected through a 0.075 mm sieve, where the loosened and weighed mass was added to the equation:

$$P_i = \frac{M_d \times 100}{M_0} \times 100$$

Being:

M_d = mass released from the specimen;

M_0 = mass of the specimen after oven;

P_i = mass loss by immersion, in percentage

3 RESULTS AND DISCUSSIONS

The results obtained for each of the tests performed are individually presented below, namely: compression analysis; mass loss analysis; and analysis of water absorption.

To make the comparison, values taken from ABNT NBR 8491:2012 Soil-cement bricks - Requirements are used as a reference, which are given as:

5.2. compressive strength

The sample tested in accordance with ABNT NBR 8492 cannot have the average compressive strength values lower than 2.0 MPa (20 Kgf/cm²) nor an individual value lower than 1.70 MPa (170 Kgf/cm²), with a minimum age of seven days.

5.3. water absorption

The sample tested in accordance with ABNT NBR 8492 cannot have the average water absorption values greater than 20% or individual values greater than 22%, with a minimum age of seven days. ABNT NBR 8491 (2012, p. 8).

Therefore, after compiling the data obtained in the tests, it will be possible to verify, in accordance with NBR's 8491 and 8492, if the soil cement bricks with additive of the Civil construction waste type meet these norms, being able to be commercialized and used in more clean and environmentally friendly.

Compression Analysis

Table 01 shows the average strengths referring to the age of the specimens - 40 and 80 days.

Table 01 - Data obtained in the compressive strength test

Dosage	Average Resistance (MPa)	
	40 days	80 days
Soil + 00% residue + 10% cement	0.54	0.67
Soil + 10% residue + 10% cement	0.65	0.67
Soil + 20% residue + 10% cement	0.65	0.66
Soil + 30% residue + 10% cement	0.79	0.82
Soil + 40% residue + 10% cement	1.07	1.01
Soil + 50% residue + 10% cement	1.08	1.20

Source – The authors.

Analyzing Table 01, an increase in resistance is observed when incorporating construction waste into the soil. This increase was higher mainly in soil bricks with 40 and 50% residue, the strength coincidentally doubled.

However, according to NBR 8491 (2012), the sample tested must present at least seven days of age, an average of compressive strength values equal to or greater than 2.0 MPa, and individual values equal to or greater than 1.7MPa. Through the data described in that table, it is possible to observe that none of the dosages studied reached the values established by the standard.

It is noticed that the dosages had their resistances increased at 80 days in relation to 40 days. This behavior indicates that the chemical reactions that occur in cement improve the mechanical properties over time.

Mass Loss Analysis

Table 02 shows the mass losses of bricks with different amounts of additives and different age of the specimens - 40 and 80 days. For checking the loss of mass by the same.

Table 02 - Data obtained in the mass loss test

Dosage	Weight loss (%)	
	40 days	80 days
Soil + 00% residue + 10% cement	0.09	0.10
Soil + 10% residue + 10% cement	0.20	0.20
Soil + 20% residue + 10% cement	0.20	0.20
Soil + 30% residue + 10% cement	0.20	0.20
Soil + 40% residue + 10% cement	0.20	0.20
Soil + 50% residue + 10% cement	0.22	0.21

Source – The authors.

The tested bricks showed mass loss within the specified standards since they did not lose even 1% of the mass at any of the tested ages.

Analysis of Water Absorption

Table 03 presents the values of water absorption in the bricks of different amounts of additives and different age of the specimens - 40 and 80 days. To check the percentage it absorbs.

Table 03 - Data obtained in the water absorption test

Dosage	Water absorption (%)	
	40 days	80 days
Soil + 00% residue + 10% cement	21.32	23.58
Soil + 10% residue + 10% cement	21.93	21.57
Soil + 20% residue + 10% cement	19.15	19.67
Soil + 30% residue + 10% cement	18.55	20.19
Soil + 40% residue + 10% cement	15.30	15.55
Soil + 50% residue + 10% cement	16.95	18.60

Source – The authors.

NBR 8491 (2012) prescribes that the average of water absorption values must be less than or equal to 20%, and the individual values equal to or less than 22%, at 28 days.

Through Table 03, it can be seen that only the type of block that does not have any percentage of residue (type x), is not in accordance with the Standard, showing that the inclusion of the residue can be beneficial, reducing the porosity of the block and automatically absorb water by the bricks.

4 FINAL CONSIDERATIONS

Soil-cement bricks are an alternative for a cleaner construction, since most of them do not need cuts, as they have internal holes that allow the passage of conduits and conduits, or even water pipes, sanitary sewage and even even rainwater.

In addition, we still have the issue of carbon dioxide emission to the environment, which in the case of soil-cement bricks is zero, since the block is not directed to burning.

Regarding the civil construction waste, it was observed that the amounts of this additive incorporated into the soil were not sufficient to achieve the technical feasibility of soil-cement bricks.

As no Standard regulates the amount of additive that can be placed in the mixture, a maximum of 50% was chosen, which is half of the total mass; comparing with the compression results, it is observed that, increasing the residual additive even more, there is the possibility of increasing the strength, as well as increasing the percentage of portland cement ; however, one must not forget that it is a soil-cement brick, and the presence of soil in it is extremely important.

Although none of the dosages of the produced bricks reached the compressive strength values prescribed by NBR 6491 (2012), the addition of civil construction waste significantly improved their characteristics, both in terms of water absorption, since only the witness did not obtain the expected index, as in mass loss, where all obtained the index well below the limit, which is below 5%.

In addition to significantly improving, this type of brick is a means of keeping the construction clean, reducing costs in purchases of inputs, waste in construction, in addition to helping the environment, as it is an ecological brick.

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CHAPTER 98

Study on the practical notions of tolerance

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ABSTRACT

The practice of tolerance is essential in any society, given that diversity is a strong characteristic of the human beings that compose it. Respect for people with their different beliefs, positions, and ways of being in the world is, without a doubt, a value to be cultivated both for the dignity that is proper to each human being and for the maintenance of harmonious coexistence among them, since, man is a social being.

1 INTRODUCTION

The practice of tolerance is essential in any society, given that diversity is a strong characteristic of the human beings that compose it. Respect for people with their different beliefs, positions, and ways of being in the world is, without a doubt, a value to be cultivated both for the dignity that is proper to each human being and for the maintenance of harmonious coexistence among them, since, man is a social being.

The discussion about tolerance is not new. In sixteenth-century France, it was already present among those who argued that the provisional presence of Protestants should be allowed in the country so that it would be able to overcome the crisis it had been facing. (AMARAL, 2008). Authors such as John Locke, Voltaire, and John Stuart Mill, among others, also made their considerations on the subject based on the influence of the modern context in which they lived.

According to SANTOS (2013), in Modernity, there was a strong belief that reason would lead humanity to progress and the construction of a more fair and tolerant society, a belief that was frustrated by the numerous atrocities that occurred in the 20th century, such as the advent of the two World Wars, as well as the emergence of totalitarian regimes.

All this frustration, combined with other events that occurred in the period after the Second World War, such as the phenomenon of globalization, produced radical changes that led to the formation of the contemporary context in which we live, a context marked by phenomena such as pluralism and relativism (PARMEGGIANI, 2004; SCOPINHO, 2007) and by strong opposition to the modern ideal of reaching a universal knowledge capable of leading humanity to progress.

In contemporary society, the call for tolerance has become increasingly strong and frequent. It is not uncommon, nowadays, to see public demonstrations, debates in academic environments, and discussions on social media where the topic of tolerance is the main focus. However, claims or appeals for tolerance are often not accompanied by a clear notion of tolerance.

What, does it mean to tolerate? In addition to this not being a simple question to answer, the answer given to it has many implications for society as a whole, since the notion of tolerance that people or different societies adopt directly or indirectly influences how to occur relationships among those who have different beliefs, ways of life and ways of thinking.

Because of this, it is verified how much the notion of tolerance is dear to contemporary society, which makes the discussion of the theme opportune, in our days, as it has been in the past. Discussing tolerance contributes to the enrichment of its notion within society and makes it possible to reflect on how it may be possible to build a society in which there is respect for human beings in their most diverse ways of being in the world. With that in mind, this work proposes to discuss the notions and practices of tolerance in contemporary times using bibliographic research as a methodological procedure.

2 BRIEF HISTORY ABOUT TOLERANCE

Etymologically, the term tolerance comes from the Latin *tolerantia*, a term derived from the word *tolero* which means to bear. (BENEDETTI, 2011)

According to Gondim (2011), tolerance can take on multiple meanings, such as a moral virtue or a political practice. The first meaning concerns an attitude of putting up with what is judged as liable to be reprimanded, while the second means a political commitment made so that different peoples, religions and cultures can coexist peacefully.

Both the concept and the notion of tolerance have a strong relationship with the characteristics of the time in which they were conceived, which is not difficult to understand, given that each period, in particular, reveals a predominant way or ways of understanding the reality and the relationships that are established in it.

2.1 16TH CENTURY FRANCE AND THE BIRTH OF TOLERANCE

Conflicts between Catholics and Protestants in 16th century France grew to a state of civil war. In this context, several parties were formed in the country, some composed by conservative Catholics, others by moderate Catholics and still others, composed by both Catholics and Protestants, as was the case of the politiques party. These parties published in the form of treaties, pamphlets, and other resources, discussions on various themes that involved religious issues, among them, the temporary coexistence of two religions in the country so that it could overcome the crisis it had been facing. This is how the emergence of tolerance occurred, as stated by Amaral (2008).

The principle of civil tolerance, particularly defended by the politiques group, was of fundamental importance for the modern State, which applied it as a political instrument to restore peace and order in the kingdom. It is on this basis that Amaral (2008) argues that the modern State was responsible for producing tolerance by using it as an instrument to move away from religion and promote the common good. In the same line of thought, John Locke (1632-1704), one of the forerunners of the Enlightenment, also argued that the separation of Church and State was indispensable for tolerance to be possible.

2.2 JOHN LOCKE – LETTER ON TOLERANCE

The Protestant Reformation, which began in the 16th century, questioned some dogmas of the Catholic Church, moving it away from its position of dominant religion before the State. In England, this reform had particular characteristics: it was promoted through the Act of Supremacy in 1534 by King Henry VIII. According to this document, the Head of Anglican Religion became the Head of State and all subjects were to follow the king's religion under penalty of treason. Thus began the religious conflicts in England. (GONDIM, 2011).

In his Letter, Locke stated that the reason for the wars of religion that had been going on in the Christian world was not diversity, but the lack of tolerance towards people who professed different beliefs. For the author, mutual tolerance among Christians was the sign of the true church.

Defending freedom of choice, Locke was opposed to opinions that held that the propagation of religion should be done by force of arms. According to the author, it was the role of the Church to be concerned with the salvation of souls, but coercion was the task of the civil magistrate for the preservation of civil goods such as liberty, life and possessions. In this way, Locke defends the distinction of roles and non-interference between Church and State:

I affirm, however, that no matter the source from which its authority springs, being, however, ecclesiastical, it must be confined to the limits of the Church, being in no way able to encompass civil affairs, because the Church itself is totally separated and diversified from the community. and civil affairs. Boundaries from part to part are fixed and immutable. (LOCKE, 1973, p. 16).

According to Locke, the magistrate could even use arguments to convince people of the truth and lead them to salvation, however, this could also be done by anyone else. He defended the human right to exhort, correct and argue through reason about the truth or falsity of a certain opinion, but he insisted on making it clear that arguing and coercing are two different things. According to him, the civil magistrate should not prescribe articles of faith because, if he did not punish violations of a religious nature, his laws would lose their force and, even if they were applied, they would be of no use, since “enlightenment in no way can come from bodily suffering”. (LOCKE, 1973, p. 12).

Having distinguished between the roles of the Church and the civil magistrate, Locke (1973) proposed the duty of each in relation to tolerance. For him, the Church was not obliged to continue welcoming those people who did not obey its laws, however, no excommunicated person should have their

goods confiscated or suffer any kind of physical damage. According to the author, when the magistrate granted the Church the power of the sword, charity and peace were abandoned, however, when he took that power away, he encouraged mutual tolerance.

With regard to the role of the magistrate, he should not tolerate “[...] any doctrines incompatible with human society and contrary to good customs that are necessary for the preservation of society”. (LOCKE, 1973, p. 23). Nor should it forbid from being carried out, in the church, what was legally permitted in the community. Locke also defended the argument that, if the magistrate had the permission granted by law to intervene in religious matters by means of force, this would have no limits, for he would presume that he had the “[...] power to compel everything to conform to the rule of truth invented by him.” (LOCKE, 1973, p. 23).

As you can see, Locke was a strong advocate of the separation of church and state and individual liberty. For him, everyone had the right to have his own belief, and tolerance towards those who had different beliefs was truly rational behavior and that was in accordance with what was preached in the Gospel. It must be remembered, however, that, despite having been an advocate of individual liberty, Locke (1973, p. 29) shows no tolerance for atheists. In the author's words: "Those who deny the existence of God should by no means be tolerated." At this point, the author demonstrates a certain inconsistency in his propositions.

2.5 THE (IN)TOLERANCE IN THE 20TH CENTURY

The 20th century can be pointed out as the one in which intolerance caused the most destruction, thus characterizing it as a deeply painful mark in the history of humanity.

The First World War (1914-1918) led to countless deaths, in addition to leaving millions of them refugees, as stated by Burigana (2014).

The inter-war period (1918-1939) brought the rise of totalitarian regimes which, in turn, were responsible for real massacres in different countries. According to Carson (2013) it is likely that fifty million people died in China during the government of Mao Tse-Tung and approximately twenty million Ukrainians during the Stalin regime.

During the Second World War, Nazism in Germany led by Adolf Hitler produced the massacre of millions of Jews, not to mention gypsies and homosexuals who were also targets of Nazi hatred. (ARENDR, 1989).

After all these atrocities committed in the period between the first war and the end of the second, the United Nations (UN), created in 1945, proclaimed on December 10, 1948, the Universal Declaration of Human Rights, a document whose based on human dignity and stressed equal rights and freedom of belief and expression, committing to the practice of tolerance. (BRAZIL, 2008).

This document served as the basis for the elaboration of another reference on the subject, the Declaration of Principles on Tolerance, published by UNESCO in 1995. In this document, tolerance was

presented as a virtue that promotes peace and combats war, and which rejects dogmatism and absolutism. According to this Declaration, tolerance is not only the recognition of the freedom rights of individuals, but also “the acceptance and appreciation of the richness and diversity of the cultures of our world”. (UNESCO, 1995, p. 11). Your practice means that:

[...] every person has the free choice of their convictions and accepts that the other enjoys the same freedom. It means accepting the fact that human beings, who are naturally characterized by the diversity of their physical appearance, their situation, their their way of expressing themselves, their behavior and their values, they have the right to live in peace and to be who they are. It also means that no one should impose their convictions on others. (UNESCO, 1995, p. 12).

From these two documents it is possible to say that, in the 20th century, the notion of tolerance, in the first place, intended to oppose all types of atrocities committed from the First World War to the end of the Second, and in addition to highlighting the human dignity and the freedom of individuals to express their most diverse beliefs and ways of being, also emphasized the acceptance and appreciation of differences.

3 TOLERANCE: CONTEMPORARY NOTIONS

To understand how tolerance is defined, thought and discussed today, it is necessary to understand the characteristics of the context and contemporary society which, in turn, have a strong relationship with the profound changes that have taken place since the last century. According to Gatti (2005), there is no consensus on how to name the current phase of history in which a new society is produced. Among those who are concerned with understanding the period in which we are living, there are those who agree in calling it Postmodernity, although, for others, the term is not very representative, since it suggests a rupture with Modernity, which has not yet definitely happened, as is the case with Zigmunt Bauman.

Despite these controversies about how to name the current period of history, it is possible to understand it from the study of its characteristics, as well as the context in which it was produced.

With the countless atrocities committed during the totalitarian regimes and the two great wars of the 20th century, the modern dream that human reason would lead humanity to progress and the construction of a more tolerant society was frustrated. After the end of World War II, the world, divided between two rival systems represented by two great powers, the United States and the Soviet Union, still lived under constant tension and fear that a third war would happen.

Azevedo (1993) apud Gatti (2005, p. 599), in his synthesis about the characteristics of Postmodernity, points out that, in its emergence, it was related to a “historical and cultural invalidation of the great analyzes and their resulting reports of emancipation”. The events that took place in the 20th century disqualified the promise of salvation for humanity, according to the author. In this way, “[...] there is great suspicion regarding the ideals of Modernity, due to the failure of the created utopias – whether as

scientific explanations of the real, or as saving propositions – and not carried out in the daily life of modern culture and societies” . (GATTI, 2005, p. 600).

Another characteristic of the postmodern period, according to Azevedo (1993, p. 31) apud Gatti (2005, p. 600), is that, in it, the great epistemological models, which intended to achieve truth, objectivity and universality, they were deconstructed through “indeterminacy, discontinuity, theoretical and ethical pluralism, the proliferation of models and projects”.

Bauman (2001) uses the term Liquid Modernity to refer to the current period of history, because, in his point of view, the term postmodernity only talks about what current society is not, that is, that it is not it's modern, yet it doesn't say anything about what it actually is. For Bauman, what actually exists are two Modernities, which he calls Solid Modernity and Liquid Modernity.

According to the author, Modernity is characterized by the dissolution of solids or structures present in society. It is this argument that he uses to defend the idea that we are still living in Modernity. The difference between the two Modernities, solid and liquid, would then be the fact that, in Solid Modernity, there was indeed an intention to dissolve old structures, but with the intention of “clearing the area for new and improved solids, to replace the inherited set of deficient and defective solids by another set, improved and preferably perfect, and therefore no longer alterable”. (BAUMAN, 2001, p. 9).

With regard to Liquid Modernity, the author uses the metaphor of liquidity to explain why he calls the current phase that way and, thus, characterize and differentiate it from Solid Modernity. Just as fluidity is characteristic of liquids, the fact that they move and change very easily and quickly, in the same way, institutions and the relationships between them and individuals or between them, in today's society, no longer have a solid and durable structure. “The time has come for the liquefaction of patterns of dependence and interaction. They are now malleable to a point that past generations have not experienced [...] but, like all fluids, they do not hold the same shape for long.” (BAUMAN, 2001, p. 14).

Another change also pointed out by Bauman (2001, p. 38) that characterizes the liquid society is the “deregulation and privatization of modernizing tasks and duties”. This means that the responsibility for social improvement previously attributed to reason, understood as the collective property of humanity, has changed its place, becoming related to the individual's self-affirmation. This is reflected in the change in the ethical/political discourse that turns “the focus of that discourse on the right of individuals to remain different and to freely choose their own models of happiness and an adequate way of life”. (BAUMAN, 2001, p. 38).

5 DISCUSSION

In general, the different conceptions of tolerance agree that it would be the acceptance and recognition that others have the right to adopt beliefs, opinions, worldviews and ways of life different from those we ourselves adopt or believe to be the most correct. However, despite such an understanding, it is

still possible to raise some questions, which require a more in-depth discussion on the subject. Among them, the question about the limits of tolerance and where they should be established stands out.

Forst (2009) suggests that these limits should be placed at the point where intolerance begins, but, given this statement, it is possible to question what, in fact, intolerance would be. This is a very relevant issue for the discussion proposed in this work, since it is possible that major problems are generated by the lack of a clear understanding of intolerant actions and behaviors, and even when, due to this lack of clarity, people start to consider all those who disagree with their opinions as intolerant.

Faced with the argument that we cannot tolerate the intolerable or the intolerant, it is necessary to be very careful not to end up labeling individuals as intolerant based on mistaken assumptions. That is why the notion of tolerance, as well as a more in-depth reflection on the subject, is so fundamental for today's society, which has diversity as one of its main characteristics.

When we define tolerance from a relativistic perspective, such as that presented by Maliska and Wolochn (2013), which presupposes the abandonment of absolute truths, it is believed that the most likely thing is that, instead of contributing to the construction of a more tolerant society, we end up having the undesired opposite result, since there are great chances of people being labeled as intolerant for not being able to make this relativization of life and values.

Although the authors present the argument that in the religious context faith does not need to be relativized, but that it is necessary to understand that the faith of a certain person is as absolute as that of another, this is still a relativistic conception. What happens, in practice, is that most people do not consider the beliefs of others as true as their own, although some manage to make this relativization.

It is believed that people are not necessarily intolerant when they do not consider the beliefs and opinions they differ from as true as their own. Intolerance is more likely to be in the attitude of trying to impose your beliefs and opinions on others. Trying to reach the truth or believe in its existence does not necessarily result in intolerance.

The search for tolerance as a supreme value from the relativization of life and values, in turn, can end up producing intolerance. On this, theologian DA Carson had already pointed out in his book "The Intolerance of Tolerance", published in 2013, where he discusses how the contemporary notion of tolerance, based on a relativist perspective, ends up, paradoxically, producing more intolerance, since it labels all those who cannot give up certain values as intolerant.

This is a characteristic of the contemporary context in which we live, where there is a way of thinking, predominantly linked to a pluralistic and relativistic rationality and a tendency to discredit absolute values, which contributes to the contradictions present in the claims for tolerance. are increasingly stronger.

In this way, Paul Ricoeur's view presented by Xavier (2017) seems to be more coherent in admitting the difficulty in relationships between people with different opinions and characterizing as intolerance the attempt to impose a certain worldview or point of view on others and, as tolerant, that

behavior of respect for the person with whom we disagree, renouncing the desire to impose our beliefs and opinions on him.

From this notion, it is possible to verify that disagreement is present when talking about tolerance, which in a relativistic view seems to be absent, because, when considering the belief and way of life of the other as true as mine, the degree of disagreement is almost nil. For there to be disagreement, it is necessary to perceive a significantly negative aspect in the belief and view of the other. Thus, we agree with Williams (2009), for whom the practice of tolerance is possible in contexts where people consider opinions contrary to their own to be wrong, but admit that those with whom they disagree have the right to think and live as they wish.

It is not necessary to say that all worldviews are equally true to be tolerant, but it is necessary, as Paul Ricoeur says, to renounce the desire to impose on others the worldview taken as true. And that's not the same thing as trying to convince people that your point of view might be wrong and ours might be right. It is possible, yes, to argue with the intention of convincing without going beyond the limits of tolerance. Just as Locke was keen to make clear in his "Letter on Tolerance", it is also emphasized here that arguing is different from coercing and that people have the right to dialogue and try to convince one another about certain ideas, beliefs and ways. to see the world, but that it is everyone's duty to accept that the right to disagree is legitimate and that no one should be forced to adopt an opinion or belief with which they disagree.

Following a similar line of reasoning, Quintás (2018) makes a very interesting comment. According to him:

Anyone who gets excited about defending a conviction is criticized for trying to impose it on others in an intolerant way. Is this enthusiastic and reasoned defense of an idea really an attempt at imposition? Of course not. To be excited by a conviction means that one is enriched by it and wants to keep it as a source of fulfillment and happiness. Defending it does not mean imposing it, but wanting to live it and share it with other people. This desire is not coercive at all. It actually has a participatory character. (QUINTÁS, 2018, p. 24).

For the author, a person is tolerant not when he gives up enthusiastically defending his convictions and disagreeing with the opinion of others, but when he is able to hear divergent opinions even though he continues to think that his convictions are closer to the truth than the one he believes. was presented to him. "Anyone who gets excited and tenaciously defends something valuable is undoubtedly willing to change his mind if someone convinces him, based on reasons, that he is wrong." (QUINTÁS, 2018, p. 24).

Francisco Razzo, in his book "The Totalitarian Imagination", published in 2016, in which he discusses the dangers of politics as hope, brings a very interesting reflection on how human beings deal with their claims to truth. According to the author, the experience of a feeling of unshakable conviction often leads us to go beyond the scope of personal experience to "throw ourselves firmly into an expectation of a totalizing character and of excluding everything that hinders the achievement of our mental project in the world". (RAZZO, 2016, p. 90). Also according to the author, this form of dogmatism is not characteristic

of a specific ideology, but of the human being itself. Our ability to construct images of a perfect world can lead us to force others to adapt to such worldviews. This is what he calls the totalitarian imagination.

The tendency of a totalitarian mind is to try to eliminate everything that stands in the way of its project of a perfect world. In this way, it excludes and demotes even to a non-human category those who are seen as barriers or hindrances to reaching the truth. (RAZZO, 2016). It is from this notion that we understand that it is not the belief in the truth that produces intolerance, but what is done with this claim to truth and how this claim affects relationships between people.

The thesis defended by Razzo (2016, p. 116) is that “[...] the totalitarian imagination [...] takes place through the consecration of the formula: “it is not enough to be true for me, it must be true for everyone”. ”“. This is something that can happen even when someone adopts a relativistic worldview and tries to impose that perspective on others. It is common to defend the argument that a relativistic worldview is the one that most contributes to the construction of a tolerant society, however, when this perspective is imposed on others under threat of being labeled as intolerant to those who disagree with it, the product of this seems to be, in fact, intolerance.

Within this discussion, it is also opportune to emphasize that accepting the existence of differences without seeking to end them does not imply saying that all differences should be tolerated. Like Machado (s/d), it is stated that it is necessary to recognize that, within this great diversity that characterizes human existence, there is a set of values and rights that must be preserved, as well as actions that, in no way, can be accepted, such as rape, pedophilia and murder, for example. However, it is also necessary to recognize together with the author that it is not an easy task to establish this limit between what can or cannot be tolerated.

The political positions in Brazil today are a clear illustration of how the search for tolerance can end up resulting in the intolerance that is so much desired to be eliminated. It doesn't take a very deep investigation on the internet to come to the conclusion that the struggle for tolerance has revealed that people, however well-intentioned they are, have become what they most criticize. It is the paradox of intolerant tolerance pointed out by Carson (2013). In the name of tolerance, people have reduced each other to mere obstacles to the conquest of the long-awaited tolerant society.

In this attempt to make a perfect world project work where intolerance is non-existent, the subject who defends a discordant position is seen as a threat, sometimes seen as the very incarnation of evil that needs to be fought at all costs. In this way, the space for dialogue is almost non-existent and interactions between the parties, most of the time, result in exchanges of offenses. Thus, these interactions by no means represent an authentic discussion, in which, according to Quintás (2018), there is space for the interlocutor to present the arguments that support his opinion. What exists, in fact, are interactions in which no one shows any willingness to listen to what the other side can present as valid, which, according to the author, can quickly turn into fanaticism.

This is a context where the use of the argument that we cannot tolerate the intolerable is quite common. And using the reflection brought by Razzo (2016) that the totalitarian mind seeks to exclude those who hinder the realization of a perfect world, in a context in which tolerance is seen as a supreme value, one of the means of excluding those with whom one disagrees. and which, therefore, are seen as barriers to the project of a tolerant society, is precisely the use of the argument that the intolerable cannot be tolerated. By labeling those who disagree with my opinion as intolerant, I tarnish their image in society so that they don't have the space to express themselves.

Thus, opposing sides seek to exclude each other by accusing each other of being intolerant and rejecting dialogue with each other on the grounds that they cannot tolerate the intolerable. In this attempt to put an end to all threats to the construction of a plural society, which values the rights of citizens while preserving the characteristic diversity of the human being, it is possible to perceive the opposite result, that is, a society in which individuals seek to exclude those of who disagree and where there is only dialogue between those who share the same opinions.

Another example in which this contradiction is present is what happens in the case of the defense of minority rights. It is worth mentioning that the objective here is not to make generalizations and to frame all those who fight for the rights of minorities in this example, nor to try to delegitimize the rights of these people, but only to highlight that this is something that already exists in reality and use the case as an illustration for the proposed discussion. According to Razzo (2016, p. 108), currently, “[...] the radical discourse in defense of “minorities” has become one of the emblematic paradigms of a mentality with a strong totalitarian tendency”. The author states that these groups organize themselves from an agenda of struggles for rights seeking social acceptance, but, in this struggle, they claim the radical transformation of society. In this context, those who are not in favor of this transformation without necessarily being against the guarantee of the rights of those who belong to these groups are, once again, labeled intolerant without having the proper opportunity to present their point of view.

In March 2018, a dissertation entitled “The Basic Human Good of Marriage in the Neoclassical Theory of Natural Law: Practical Reason, Common Good and Law” developed by Dienny Riker, under the guidance of Prof. . Dr. Victor Sales Pinheiro, caused revolts on social media by groups who understood that the work fostered prejudice and violence against the LGBT community.

The dissertation addressed the marriage perspective defended by John Finnis, an Australian philosopher and jurist considered one of the main representatives of natural law in contemporary times. Initially, the work was presented as a research proposal entitled “Marriage: Its Marital Nature and Relevance to the Common Good” for admission to the PPGD. After the student had fulfilled all the criteria established by the PPGD-UFPA regiment, the dissertation was delivered and its defense scheduled for April 4, 2018, which was later postponed due to the repercussion it caused. (ANAJURE, 2018).

Upon becoming aware of the existence of the work and its content, some groups declared to be committed to the struggle for the rights of the LGBT community began a series of demonstrations on social

networks and at UFPA itself, characterizing the research as non-scientific and of a religious nature, as well as contrary to human rights. (ANAJURE, 2018)

According to an article published on the “G1 Pará” news portal, the groups that were protesting against the dissertation did not intend to prevent the work from being defended, but only to exercise their right to take a stand against it.

It is not the purpose of this work to investigate in depth the theory on which the research developed by the student is based, as well as those who spoke out against the work did not do so either. However, according to the Doctor in Philosophy and General Theory of Law from USP, Pablo Antonio Lago (2018), who defends the union between people of the same sex, the work developed by the student cannot be considered non-scientific and based on religious doctrines. In an article published by the newspaper “Gazeta do Povo”, he states that the theory developed by Finnis, an author with whom he himself disagrees, is not based on religious or metaphysical explanations. Therefore, it would be a mistake to disqualify the research developed using these arguments.

Although the protesters against the dissertation stated that they had no intention of preventing the defense, the fact is that they questioned the approval of the research by the PPGD-UFPA and, as Pablo Antonio Lago pointed out, without having read the work and presented criticisms of the arguments. that the author presented in the same, from which it appears that, for them, a public educational institution that values human rights should not offer space for the production of research that defends a position against marriage between people of the same sex.

Thus, it is understood that the case is a clear example of intolerance within the academic environment. From the arguments raised by the protesters, it is possible to conclude that, in their view, only those who agree with same-sex marriage can be considered a defender of human rights and that, therefore, there should be no space for dialogue. in the academy for those who defend a contrary position. Ultimately, this is an attempt to impose a point of view on others, which, as discussed earlier, is what characterizes intolerant behavior.

And, once again, the argument behind all these protests is that the intolerable should not be tolerated, which, in the case presented, would be the defense of a position contrary to the same-sex marriage. So, again, in the name of tolerance, we try to exclude those with whom we disagree, depriving them of expressing their views in an environment where dialogue should be valued.

A similar case to this occurred in November 2017, when the American philosopher Judith Butler was in Brazil. Butler is one of the main references within the discussions on gender identity, but on the occasion, he was here to participate in the event “Os fins da Democracia” held by Sesc Pompeia. On November 7, 2017, the date on which the event took place, protesters for and against the philosopher gathered to protest in front of the building where it would be held. Before that, an online petition had already been signed by about 320,000 people who took a stand against the coming of the philosopher. (BETIM, 2017).

As much as they did not agree with the theory defended by Butler and had the right to manifest themselves publicly against it, the fact is that when they tried to cancel the event in which the philosopher would participate, in addition to claiming that Butler left Brazil and of the clear demonstrations of hatred during the protests, these groups were representatives of intolerance by seeking to exclude and silence instead of dialoguing and even seriously and coherently refuting the points of view with which they disagree.

6 FINAL CONSIDERATIONS

The present study made it possible to discuss the notion and practice of tolerance in contemporary times. At first, a brief historical presentation was made of how tolerance was discussed over time and later, a presentation of the characteristics of the current period of history was made in order to better understand how tolerance is currently understood.

In the modern period, this notion was closely linked to religious issues, which is not difficult to understand considering that this was a period marked by conflicts of this nature. In addition, discussions on the subject were based on the modern ideal that reason and science would lead humanity to progress and the construction of a more tolerant society, in which individual freedom was respected, an ideal that ended up being frustrated after the events of the 20th century, specifically, the atrocities committed between the beginning of the First World War and the end of the Second. This, together with other factors, ended up resulting in the production of a new context in which a pluralist and relativist way of thinking prevails and which is opposed to the modern ideal of reaching universal knowledge.

The study showed that there is a certain understanding that tolerance is the recognition that others, like me, have the right to have their own beliefs, opinions and ways of life, as well as to express them. Despite this understanding, it is verified, from an analysis of reality, that it is necessary to be very careful when establishing limits for tolerance, especially in view of the suggestion that these limits should be placed where intolerance begins and the argument that the intolerable should not be tolerated, since great problems can be generated when people adopt a shallow notion of tolerance and, based on mistaken assumptions, begin to consider intolerant all those who disagree with their opinions, beliefs and ways of life.

From the analysis of the contemporary context, specifically the Brazilian one, it is possible to find, as seen in the examples presented, different cases in which the search for tolerance, supported by a little-depth notion of it, has contributed to the perpetuation of intolerant practices.

In view of this, a notion of tolerance is defended here, in which the difference is recognized without necessarily trying to eliminate it, although it is necessary that between these differences there is a relevant level of disagreement. Thus, tolerating would be the action of those who recognize the other's right to have beliefs, opinions and ways of life different from their own, even though they see them as a relevantly negative aspect.

In view of everything that has been presented in this work, it is possible to perceive that the problem of lack of tolerance is far from being overcome and, from this, the extreme importance of discussions on this topic today is reaffirmed. It deserves special attention due to the numerous contradictions it presents and the problems that can result from them, among them, the very perpetuation of intolerance in society. Thus, when discussing tolerance, it is possible to identify such contradictions and, in this way, contribute to the construction of a society in which there is space for dialogue and for the expression of differences.

Finally, it reinforces the importance of academic research that proposes to study the topic discussed here, expose its problems and contradictions and the social impacts that they can generate, in addition to seeking proposals to overcome them. The study developed here was limited to discussing the subject through bibliographic research, however it is believed that field research can bring even more enriching contributions to discussions on tolerance. In view of this, an incentive for the development of such studies is left here.

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CHAPTER 99

Latin american integration route (RILA) and globalization: importance of implementing a transnational legal intelligence

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ABSTRACT

South America, at the beginning of the 21st century, has become one of the most attractive markets on the world stage, especially when it comes to commodity exports, because, with the significant increase, under the leadership of agribusiness in Brazil, a series of international political and economic movements are reflected in this part of the South American territory, such as the Agreement between Mercosur and the European Union, with a significant share of ¼ (a quarter) of world commercial transactions.

1 INTRODUCTION

South America, at the beginning of the 21st century, has become one of the most attractive markets on the world stage, especially when it comes to *commodity exports*, because, with the significant increase, under the leadership of agribusiness in Brazil, a series of international political and economic movements are reflected in this part of the South American territory, such as the Agreement between Mercosur and the European Union¹, with a significant share of ¼ (a quarter) of world commercial transactions.

However, starting from regional and endogenous movements, the consolidation of a link with the Pacific Ocean, starting from Brazil, is in the process of being consolidated, as claimed by various political and private sector leaders, especially in Chile, and Brazil, Paraguay and Argentina. There has always been a dream of connecting the two oceans that bathe the coasts of the South American continent. However, under the pressure of economic demands and the opening of alternative routes, and new markets, the manifesto of local governments occurs to create the necessary infrastructure for a new entry of investors, diverse imports, tourism, and exports of agricultural products, such as soybeans, corn, poultry, beef, pork, cellulose, ores, etc...

The union of efforts of the four South American countries, Brazil-Paraguay-Argentina-Chile, appears to be a response to the economic crisis that is plaguing several nations at the beginning of this century and millennium, including in South America. However, the transformations and consequences of

¹“IMPORTANCE AND SIGNIFICANCE - MERCOSUR and the EU together represent a GDP of around US\$ 20 trillion, approximately 25% of the world economy, and a market of approximately 780 million people. The agreement will constitute one of the largest free trade areas in the world. The EU is MERCOSUR's second trading partner, which is the EU's 8th largest extra-regional partner. Bi-regional trade flow was over US\$90 billion in 2018. Brazil exported more than US\$42 billion to the EU, approximately 18% of the country's total exports. The EU is the largest foreign investor in MERCOSUR. In 2017, the stock of EU investments in the South American bloc totaled US\$ 433 billion. Brazil is the fourth largest destination for extra-bloc foreign direct investment (FDI) in the EU.” (BRAZIL, 2019)

the establishment of a new trade route, an international business corridor, are inevitable, especially regarding social, cultural, and environmental aspects, in addition to intense economic and technological flows.

The emergence of new scenarios, within the scope of a cross-border territory, from this political and economic intervention, in the South American heartland, composed of a set of bioethnic, multicultural origins, natural riches, and fertile fields, is, therefore, the reason for the present study, in the light of the law of sustainable development, in place, which will be outlined and studied below.

2 THE EMERGENCE OF A NEW COMMERCIAL CORRIDOR FROM A CROSS-BORDER TERRITORY OF WEALTH AND AGRICULTURAL PRODUCTION: LATIN AMERICAN INTEGRATION ROUTE (RILA), OR BIOCEANIC CORRIDOR OR ROUTE.

An undeniable fact, given the recent news published by the international press, is that the trade war between the United States and China, in addition to the arm-twisting between the world powers to ensure the top of world trade hegemony, causes great concerns and movements in all the nations of the globe.

The acceleration towards the signing of the agreement between the European Union and Mercosur, which, after about 20 years of unsuccessful negotiations between the European Union and Mercosur, is now in its final phase, is certainly one of those consequences, mentioned above, in search of consolidation of other alternatives and as a mechanism of marketing strategy and defense, in the face of the dynamic movement that has been ravaging all countries and continents, fiercely, in recent times.

Thus, although treated as a regional and merely endogenous fact, the announcement of the construction of three bridges between the borders of Brazil and Paraguay, by their governments, can also accelerate a series of business around the world, through the ports of the Pacific, especially from the west coast of Chile, towards Asian countries, the western part of northern South and Central America, the Caribbean, the United States and Canada.

Among these constructions of border bridges, between Brazil and Paraguay, there is one that will be on the Paraná River, in the Marco das Tres Fronteiras region, which will link the city of Foz do Iguaçu, in the State of Paraná, Brazil, with the city of Presidente Franco, in the Department of Alto Paraná, Paraguay, a project called the Second Border Bridge over the Paraná River (the first is the Friendship Bridge that connects the cities of Foz do Iguaçu, in Brazil, with Ciudad del Este, Department of Alto Paraná, Paraguay). A third bridge ², also on the border of the two mentioned countries, will be on the Paraguay

²“Acts of the National Congress. I make it known that the National Congress approved, and I, Cássio Cunha Lima, First Vice-President of the Federal Senate, in the exercise of the Presidency, under the terms of the sole paragraph of art. 52 of the Common Rules and item XXVIII of art. 48 of the Internal Regulations of the Federal Senate, I enact the following LEGISLATIVE DECREE No. 110, OF 2018 (*) Approves the text of the Agreement between the Government of the Federative Republic of Brazil and the Government of the Republic of Paraguay for the Construction of an International Highway Bridge over the Paraguay River between the cities of Porto Murtinho and Carmelo Peralta, signed in Brasília, on June 8, 2016. The National Congress decrees: Art. 1 The text of the Agreement between the Government of the Federative Republic of Brazil and the Government of the Republic of Paraguay for the Construction of an International Highway Bridge over the Paraguay River between the Cities of Porto Murtinho and Carmelo Peralta, signed in Brasília, on 8 June 2016. Sole paragraph. Pursuant to item

River, connecting the city of Porto Murtinho, in the State of Mato Grosso do Sul, Brazil, with the city of Carmelo Peralta, in the Department of Alto Paraguay. And finally, a border bridge with the same countries, over the Rio Apa, to connect the Brazilian city of Porto Murtinho to the city of San Lazaro in the Department of Concepción.

But, for the purpose of these studies, it is worth noting the extensive and cross-border territorial scope of this third building, and its possible legal consequences, from this possibility of building this announced bridge over the Paraguay River, between Porto Murtinho, Brazil and Carmelo Peralta, Paraguay. , therefore, it is from this land connection that makes it interesting, above all, to analyze the transformation of new social, cultural, historical, economic, environmental, legal phenomena, migratory flows, with the attraction of investments in road, customs and port infrastructure, for the flow of grains, meats, ores and other raw materials for industries and world consumption.

The transformations in the territory, therefore, are for the construction of an economic model in the region that aims to meet growing demands, especially for agricultural production to feed billions of people, in other countries in South, Central, North America, Asia and Oceania. , leaving the Brazilian territory, from the Cerrado, Mata Atlantica, Pantanal regions, entering the Paraguayan Chaco region, northern Argentina, the Atacama Desert, the Andes Mountains, until arriving at the ports of northern Chile, Antofagasta, Iquique and Mejillones. And, as an effect of this connection, an intense import is being planned, with entry into this vast territory, of products coming mainly from Asia and the United States.

This regional territory in the heart of South America initially involves four countries, Brazil, Paraguay, Argentina and Chile, and is being called the Bioceanic Route (because it connects the South American east coast in the Atlantic Ocean to the west coast in the Pacific Ocean) or Latin American Integration Route (RILA), the latter being the name preferred by business people and universities, as it will integrate peoples and cultures.

3 THE URGENT NEED FOR LEGAL PAVING, ALONG THE TERRITORY OF THE RILA, AS A CONSOLIDATION OF THE DEMOCRATIC STATE OF LAW IN THE FACE OF GLOBALIZATION

At this point, the main reason for this study, is the emergence of a new territory that, due to its *sui generis multidimensionality* , escapes from the traditional models of State ³and the classic concept of

I of the caput of art. 49 of the Federal Constitution, any acts that may result in a review of the aforementioned Agreement are subject to approval by the National Congress, as well as any complementary adjustments that entail burdens or burdensome commitments to the national patrimony. Art. 2 This Legislative Decree enters into force on the date of its publication. Federal Senate, on April 18, 2018 Senator CÁSSIO CUNHA LIMA First Vice-President of the Federal Senate, in the exercise of the Presidency (*) The text of the aforementioned Agreement is published in the Federal Senate Gazette of 03/14/2018.” (Official Union Gazette No. 75, of 04.19.2018, Section 1, p. 03).

³In this sense, it is also highlighted: “The world society, which has taken a new form in the course of globalization – and this not only in its economic dimension -, relativizes and interferes in the performance of the national State, since an immense variety of connected places among themselves cross their territorial borders, establishing new social circles, communication networks, market relations and forms of coexistence.” (BECK, 1999).

sovereignty, because, in the face of the new era of globalization, the peoples are subject to new models of social standards, by globalizing impositions, in a network and fully connected, in the face of "... a world of global flows of wealth, power and images, the search for identity, collective or individual, attributed or constructed, becomes the basic source of social meaning" (CASTELLS, 1999).

This is all that is happening in a large part of the planet, as a result of globalization, at the same time that it means progress for the region, but, on the other hand, it shows legal uncertainty⁴, for those who have never seen such a huge movement as it is currently happening, as it is one of the last strongholds not yet impacted by the advance of world economic growth, which can mean a world very different from the current scenario, from the current *modus vivendi* of most of those who were born and still live in this region. In summary, therefore, it is about the last corners not yet interconnected, without the strong global connection, with low population density, intact natural resources, without any access to the great centers, without a doubt, it is a territory that, soon and in a very fast, it will change scenarios, concepts and social and economic behaviors.

However, in some corners of the globe, the connection can occur, it should be noted, with greater or lesser intensity, depending on various political, social, technological or economic factors that cause direct and indirect reflexes.

But, as a means of guaranteeing the necessary legal certainty, in the preservation of goods and rights to the peoples of the territory, in the most diverse themes that involve, for example, human dignity, territorial peace, happiness and economic and social prosperity in a sustainable way, whether in the intense traffic or territorial occupations, therefore, it becomes necessary and urgent, as a matter of priority, broad reflections, debates and construction of legal models that can guide individual, collective, institutional, exploratory relationships in the territory, in a systemic way, which matter for contemporary societies that strive for the Democratic State of Law.

It is observed, for example, that the classic concepts of the Theory of the State start to be relativized in this process of globalization and decentralization of the decision-making process. This process dynamically crosses borders, challenges the rules and principles of the State, threatens sovereignty (RANIERI, 2013), summarized as follows:

"The modern State of the beginning of the 21st century is faced, in its territory and in the international order, with a plurality of decision-making centers and the production of law, non-state or supra-state, which implies the relativization of the centrality, unity and territoriality of power. state-owned. Its sovereignty is shared or shared with other subjects of the international and regional order, causing the decline of state authority as well as the loss of the monopoly of political power. On the other hand, the prevalence of economics over politics, largely due to processes of transnationalization of input, production, capital, finance and consumption markets, and the loss of state control over the currency, associated with information technology and to the organization of the network society relativized the sovereignty of States." (RANIERI, 2013).

⁴"The legal order, which is justified as a mechanism of objective and prescriptive regulation of a society, describes an unreal world to the daily problems and priorities of social groups, whose degree of complexity increases exponentially in a multifaceted society. The consequence is that these groups are alienated from the state legal order and the creation of autochthonous mechanisms for regulation and conflict resolution." (BARRAL, 2006).

New legal concepts emerge or must be rethought, thus, with globalization and its effects for the relativization, deconstruction or conceptual adaptation of the State and its political power and performance, to the demands of the new times, as seen above. However, as there is no other model, it is still important to defend the existence of the State, as a presupposition of order and organization in contemporary society. law, as the case may be.

It is therefore urgent to adopt urgent actions of support and caution, in the legal sphere, when this new territorial, multinational, cross-border, multicultural space, with transcontinental reflexes, is born, which involves this part of South America that accounts for 25% of the current transactions with the European Union, not to mention business with other global continents, admitting and immediately inserting the discussions to safeguard the peoples, the territory and the relationships that affect them (locally) and them (of the location).

3.1 INTEGRATION AND STANDARDIZATION OF NORMS AS AN EFFECT OF TRANSNATIONAL LAW: URGENCY TO BUILD LEGAL CERTAINTY IN LOCAL AND TERRITORIAL DEVELOPMENT

Legal integration is based on the assumption that all the rules of the countries involved in the territory, where the Latin American Integration Route is located, will have a broad dialogue to be applied to commercial, social, private and public relations, without requires a substantial change in the original essence of its rules, while standardization predisposes a rectilinear application, but with changes that are necessary to adapt to the greater interests of the agreements, conventions or treaties.

Both legal modalities, integration or standardization of norms, can guarantee the necessary reliability of relations in the territorial scope, which can affect the principles of Public and Private International Law. In the private sphere, a new legal phenomenon called “Transnational Law” (RAMOS, 2016) has emerged, which is of ⁵non-state-centric origin, “neither national nor international, but the result of the concatenated action of private entities, with the direct or indirect support of the States”, in an interaction that makes possible the admission of a “global legal pluralism”, whose main characteristics are:

“(i) because it is composed of norms of non-state origin, (ii) aimed at cross-border events, and (iii) because it counts on the consent of the States, either through the recognition of autonomy of will or even the execution of arbitration awards. .”

In this sense, the joining of various spaces and national norms and not their mere internationalization, but something that transcends the old concepts, emerging something totally different from what had been,

⁵“The bodies producing these transnational standards can be private, such as the International Chamber of Commerce, or international, such as UNIDROIT (Unification of Private Law, which is an international organization). Decisive is the nature of the transnational norm produced, which is not domestic (for example, a law) or international (a treaty), aiming at the regulation of cross-border facts . The proliferation of Transnational Law thus consecrates the existence of a true global legal pluralism, with rules coming from the States and also from private agents.” (RAMOS, 2016).

thus, generates the so-called transnationalization of rights (BECK, 2001). , in the face of an “anarchy, in which globalization and the porosity of political borders form a window of opportunity for certain economic agents to seek full autonomy.” (RAMOS, 2016).

The new territory, in the South American Midwest, already beckons with cooperative relations between governments, companies, universities, but conflicts will also arise within society over the course of its existence, where the interests erected by Private International Law , Consequently, they should overflow into the vast ocean of Transnational Law, since the autonomy of private will will be subject, in this tuning fork of integration and legal harmonization necessary for legal certainty, fundamental rights, “equality, access to justice, privacy , among other rights that may clash with the freedom of private economic agents” (RAMOS, 2016).

Customs and customs issues, for example, represent today a very big bottleneck for the fluency that globalized development requires. Outdated methodologies and exaggerated bureaucracy prove the slowness, which contradicts the dynamics required, nowadays, by contemporary societies.

It is necessary to review concepts, especially the internal and national ones, in view of the need for a vision, no longer as a society of norms, generally, with an endogenous and protectionist vision, but, focused on an exogenous, broad, systemic plan, attentive to the latent relationships and the effects of globalization, since the “Law became _ on one well interchangeable. transposes the borders as if were a product in export. Raisin in one ball national to another, per times infiltrating without visa in Prohibited.” (ALLARD and GARAPON , 2006).

Finally, legal certainty has a central focus, which must be seen from all angles and actors that will participate in this territorial construction, whether private or public, individual or collective, since it projects integrated development “ to which the dictates of globalization can only can reinforce the need for a cross-border planning region, which requires a greater effort from its rulers” (PAIXÃO, 2005) .

Therefore, for the full consolidation of the development of the RILA, governmental, institutional, academic, business awareness and actions are urgently required, above all, in the construction of agendas from the perspective of Transnational Law and the Democratic State of Law, interconnecting not only physical structures, but the necessary legal environment to ensure peace, stability, dignity and sustainable and prosperous development in the territory.

3.2 RIGHT TO DEVELOPMENT IN THE CONSTITUTIONS OF BRAZIL, PARAGUAY, ARGENTINA AND CHILE: SIMILITUDE AND POSSIBILITY OF TRANSNATIONAL LEGAL INTEGRATION

The Constitution of the Federative Republic of Brazil foreshadows that one of the four fundamental objectives of the Republic is the guarantee of national development, expressed in item II of article 3. The concern with development in Brazil is quite recent (FOLLONI, 2014), even in the legal sphere.

The constitutional concern started, timidly, with the 1967 letter, growing a little with the 1969 amendment. But it is with the current Constitution, of 1988, that there is an intense legal concern with development. The Constitution provides a detailed treatment, conforming the notion of development in a broad sense (technological, economic, social, scientific, cultural, human, urban, educational, personal, national, country development). An interesting fact that the author points out is that until the 1990s, GDP was used to measure development, which shows that until that time, economic growth was synonymous with development. (FOLLONI, 2014, p. 70).

The author also points out that in the Constitution of the Republic, there is a mention of the themes of economic development and social development. However, the themes are linked, and at times the Constitution itself unifies the two terms, such as the expression “economic and social development”. That said, it was argued that one development cannot cancel out the other (FOLLONI, 2014).

This is what is proved when analyzing the themes addressed in the Constitution of the Republic: there is the major premise that is the scope of development as a whole, but that, throughout the titles and chapters that the Major Law addresses, it is perceived that the idea of development is also found when legislating on topics such as the environment, education, research, work, for example (GABARDO, 2009). The 1988 Constitution is the symbol of a socializing project of a people that seeks justice, solidarity and happiness.

Having satisfied, at least for this work, the analysis of the development of the country's Constitution, it is necessary to start with the constitutions of other Latin American countries: Paraguay, Argentina and Chile. To make such a comparison, it is necessary to consider (LEGRAND, 2018), who defends:

“If the Brazilian comparatist wants to understand a question of English law, he cannot be content with analyzing it from a positivist point of view. He must also measure it from the cultural plane. Ultimately, a positive description (such a law, such jurisprudential decisions) explains little or nothing.”

Starting, therefore, for the analysis of the Constitution of the Republic of Paraguay, it is noted that its article 6 foreshadows the quality of life as an objective to be achieved by the State. Therefore, for the objective to be achieved, the article sets out the command that the study of economic and social development with the preservation of the environment and the preservation of the quality of life of the inhabitants is urgent.⁶

It is interesting to note that, similar to the Brazilian Constitution, its Paraguayan counterpart also prescribes the defense of a right to a healthy environment, as follows:

“The preservation, conservation, recomposition and enhancement of the environment, as well as its reconciliation with comprehensive human development, constitute priority objectives of social

⁶ Article 6 - DE LA CALIDAD DE VIDA [...]. The State will also encourage research into the factors of population and their links with social economic development, environmental preservation and the quality of life of the inhabitants.”

interest. These purposes will guide relevant government legislation and policy ”. (PARAGUESE, 2019).

It can be seen that the Constitution also has provisions with limited effectiveness that seek to promote development in sectors such as child development (art. 54), the right of youth and youth (art. 56), the right to social development through from education (art. 73) to the promotion of technical education (art.78) and universities and higher institutes (art.79).

Regarding education in general, the Paraguayan Constitution, as well as the Brazilian Constitution, considers that education must be taken as a public policy necessary for the achievement of development. In a very similar way to the Brazilian one, the constitution of Paraguay allowed the State to establish policies for education at all levels (either regulating or promoting), guaranteeing, in addition, the protection of autonomy for higher education. (art. 79).

In relation to indigenous protection, a topic that is quite relevant for the countries of the American continent, the Paraguayan Constitution established the right of community property for indigenous peoples to a sufficient extent so that such peoples can promote the development of their way of life, thus guaranteeing the continuity of indigenous culture and history. Furthermore, it can be seen that such lands are indivisible, non-alienable, imprescriptible and cannot be encumbered or taxed. The defense of the autonomy of such peoples over community lands is strongly defended in the Paraguayan constitution. (art. 64).

The Paraguayan Constitution also considered agrarian reform as a means of rural development to be essential for one of the facets of development (articles 114 and 115), combating unproductive lands (article 116). Also noteworthy is the relevant role of cooperatives as a means of achieving “national economic development” (national economic development) (art. 113).

Considering the multiple faces of development, the Paraguayan Constitution gave importance to national economic development. Thus, the higher law provided for the State to establish programs and policies that guide global economic activity, which will be indicative for the private sector and mandatory compliance for the public sector. (arts. 116 and 117).

Still from the perspective of economic development, the financial organization of the Paraguayan state establishes that state resources, created through taxation, must be applied only and solely for the fulfillment of national interests (art.178). Furthermore, the creation of taxes must have policies favorable to national development (art.179).

When analyzing the Constitution of Argentina, it is immediately possible to observe that the Major Norm of that country also seeks to preserve the environment, considering it relevant for human development and future generations. (art. 41). It is also noted the great concern expressed by this Constitution regarding the ethnic and cultural preservation of the Argentine indigenous peoples (art. 75).

A fact that draws a lot of attention in relation to the protection of indigenous peoples is that the Argentine Constitution seeks to recognize the legal personality of their communities (art. 75), something that was not observed in the Constitutions previously analyzed.

Compared to the Constitutions of Brazil and Paraguay, the Constitution of Argentina establishes some national maximum values, similarly, namely:

“provide it conducive to human development, to economic progress with social justice, to the productivity of the national economy, to the generation of employment, to the professional training of workers, to the defense of the value of the money, to the investigation and scientific and technological development, its diffusion and benefit”. (art. 75).

As seen, norms of limited effectiveness were again established, giving powers to the Public Administration to establish the pertinent policies.

Finally, the Chilean Constitution defines that education, in its article 10, has human development as its ultimate goal. Therefore, it will be up to the State to promote the development of education at all levels, as well as to promote scientific and technological research, artistic development and cultural protection.

Finally, in a first analysis, there is the opening that the Constitutions of Brazil, Paraguay, Argentina and Chile, provide for the same direction of common interests, such as the right to development required in the territory of RILA, however, necessary and urgent is the encouragement of more in-depth and punctual analyzes that can be carried out through governmental, business and academic groups or commissions, aiming at their harmonization or normative integration, consequently, the legal certainty and trust of the relationships established in the transnational territory, under comment.

4 FINAL CONSIDERATIONS

The new structure in the heart of South America, which involves the infrastructure that crosses the territories of Brazil, Paraguay, Argentina and Chile, called the Latin American Integration Route (RILA), constitutes a new focus of development, due to the expressive production of *commodities*, services, tourism and new investments that will transit through it, with all the effects of contemporary globalization.

Several countries, mainly from South America, Central America, North America, Asia and Oceania, will be intensifying their commercial, industrial, technological and academic business exchanges, while the Mercosur and European Union countries are beckoning to major agreements and tariff breaks, placing RILA in a territory of outstanding economic, social and legal evidence.

Among the various obstacles to territorial success and prosperity, it is necessary and urgent to form research, study and action groups, with academic, business and governmental proactivity, on the new rights that should be in force, within the scope of the RILA and the countries affected by its implementation, due to cultural and legal differences, although with a good load of similarity among themselves, however, cry out for a closer look at the obstacles that deserve priority solutions.

Therefore, in the face of this urgent legal paving that is necessary, the issues of legal harmonization and integration and, consequently, following a contemporary tendency to reduce the overwhelming effects of globalization, when the balance between the impulses of economic domination and the law is unbalanced. to free development, with the protection of life, human dignity, the environment, preservation of the multicultural cultures of peoples, with full access to justice and modern technological means, must be stimulated and encouraged by all the actors involved in the consolidation of development sustainable, prosperous and peaceful within the RILA territory: government, business, academia and society.

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CHAPTER 100

Homoafetivity in portuguese literature : the case of the novel o barão de lavos

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ABSTRACT

In this study, we are going to deal with homosexual relationships between men, especially how they are represented in literature and, in a more specific way, in the Portuguese naturalist novel *O Barão de Lavos*. What is the opposite-sex or same-sex preference? A

genetic predisposition or upbringing? A combination of both? The fact is that many, all over the world, continue to have same-sex relationships, and nothing can stop the feelings and practices of such a relationship, mainly because in some there is not even sex. But is there a genetic predisposition to homosexual attraction? Now, sexual behavior in the attraction of the opposite sex has been 'normalized' throughout history, however, the predisposition of homosexual desire was, historically, considered abnormal or, let's say, unnatural.

1 INTRODUCTION

In this study, we are going to deal with homosexual relationships between men, especially how they are represented in literature and, in a more specific way, in the Portuguese naturalist novel *O Barão de Lavos*. What is the opposite-sex or same-sex preference? A genetic predisposition or upbringing? A combination of both? The fact is that many, all over the world, continue to have same-sex relationships, and nothing can stop the feelings and practices of such a relationship, mainly because in some there is not even sex. But is there a genetic predisposition to homosexual attraction? Now, sexual behavior in the attraction of the opposite sex has been 'normalized' throughout history, however, the predisposition of homosexual desire was, historically, considered abnormal or, let's say, unnatural.

Curious that, according to Naphy (2006), male prostitutes had sex with male devotees in shrines and temples in West Africa, Cyprus, Corinth, Carthage, Mesopotamia, Phoenicia, Sicily, Egypt, Libya, as well as in ancient times. and modern India, until the beginning of the second half of the 20th century.

The desire to blame someone for homosexuality is deep and typical of many societies, past and present. Another issue discussed would be the “difference” between active and passive homosexuals. In antiquity, the importance fell on the positions exercised by each of the individuals involved in the sexual relationship, as stated by the historian Nussbaum quoted by Naphy (2006, p. 22):

Sex was not (was) in itself morally problematic. Boys and women (were) often treated interchangeably as objects of (masculine) desire. What (was) important socially (was) to penetrate rather than be penetrated. Sexual intercourse (was) understood essentially not as an interaction, but as doing something to someone.

From the millennia before Christ until the Christian era, homosexual practices were an accepted activity in the cultures of the Near East, perceptible in several literary and legal texts where homoffective

activity is mentioned. We have the interpretation made by historians about two laws of the Middle Assyrian period, concluding that the homoaffective relationship was not seen as something degenerate and/or pathological, anyone could practice it freely, as long as they did not use violence to carry out the act, namely rape. In the meantime, there was a kind of culture on the sidelines where all kinds of ambiguities, mixtures and transformations were possible.

“Literature is not just a heritage, a closed and static set of texts inscribed in the past, but rather presents itself as an uninterrupted historical process of production of new texts” (AGUIAR E SILVA, 1991, p.14), the arts in general have offered extensive discussion of homosexuality. In the 20th century, more than tens of thousands of male homosexuals were killed in concentration camps by the Nazis. The representation of this, in a valuable text, we find in the play *Bent*, by Martin Sherman, awarded in the countries in which it was staged, exposing the Nazi persecution of homosexuals and their subhuman daily life in the concentration camp, through Max's trajectory. Let's see the plot: in the 1930s, in Nazi Germany, in the midst of a hunt for homosexuals, young Max tries to flee Berlin, but is captured and sent to a concentration camp, not as a homosexual, but because he is a Jew; there he met Horst, who had been arrested for signing a pro-gay rights manifesto. They live an unexpected and forbidden love story.

When we think that about half a century earlier, we had novels that dealt with homoaffectivity, such as *O Barão de Lavos*, in Portugal, and *Bom-Crioulo*, in Brazil, we see the importance of Art, even when it exaggerates the false Naturalist moralism of Abel Botelho, or in the dubious speech of Adolfo Caminha. We see here a very important milestone, at least as an incentive for further reading on the subject. “In Brazil, depositories of the ideals of patriotic tradition and patriarchal values, Brazilian elites have always been very defensive and, therefore, vulnerable to the specter of deviant desire” (TREVISAN, 2018, p.155)

In the novel *The Third Travesseiro*, by Nelson Luiz de Carvalho (São Paulo, 1998), we meet Marcus, a young man from the middle class, he is dating Renato and thinks about starting a family, but society prevents them. A third character appears. Using an ancient resource, the novel claims that its writing was based on a true story. Renato and Marcus have to deal with Beatriz, the former's ex-girlfriend. A friend of mine, from the public school in Pernambuco, in the late 1990s, was warned by his Department of Education and was almost exonerated for having recommended this book as reading for 3rd year high school students.

But let's go back to the Weimar Republic and the play *Bent*: there, homosexuals had obtained a kind of protection, because they registered with an organ, by which they were supposed to be protected (from murderous discrimination). What the Nazis wanted was everyone's record to hunt them down, and this persecution continued in the other German regimes that followed Hitler's, until 1969. Noting here that the German government, after World War II, dictated that some homosexuals to serve their sentences to the end. Meanwhile, on the other side of the Atlantic, in 2004, the United States Supreme Court invalidated

the rest of the state laws that prohibited homosexuality , except in the Army. In other countries there have been big changes. In Europe, same-sex unions and LGBTQIA + rights are being legalized to this day.

In ancient Greece, homosexual relationships were established normally, but not exclusively, but between people of different generations – a younger man was the passive partner of an active, older man. In China (and most of the Far EAST), the most common homosexual relationship was between a lower-class man in the passive role and an upper-class man in the active role. It is interesting, in order to understand our study, to know a little about the long history of these practices on our planet so that we do not continue with the crime of wanting to punish someone for their homosexual practices and ignorance of their entire social path.

The gods of India, as in Greece and Rome, took on various appearances and showed a great willingness to love and have sex with various individuals, regardless of their sex. [...] The Hindu gods not only have homosexual relationships but also change sex and, what is more interesting, in some cases they can appear in both male and female forms – or even in both forms at the same time. [...] The result is that sex, sexuality and gender are interchangeable throughout the reincarnation cycle, generally speaking, or even within a given incarnation. [...] In fact, it was only with the dominance of Victorian Britain that Indian cultures began to change (NAPHY, 2006, p. 30 - 31).

Literature, as a whole, deals more with heteronormative relationships . The Western world is guided by Judeo-Christian-Islamic values. In one respect, however, Islam distinguished itself from these religions. For, as stated by Naphy (2006), in the 18th century, poetry and music began to be dominated by men. The same author also cites, in particular, a play with a homoaffective character , where the suffering of the lover who longs to see his beloved again is shown. Let's look at another book.

The name of the author of the novel *O Barão de Lavos* is Abel Botelho, and he dedicates the book to his brother (Luís Botelho). The narrative begins with the period “On that open and humid March night, great animation was merrily bubbling up at the end of Rua do Salitre. It was 1867”, that is, 11 years before the time in which the author is writing. Good, we have in our hands, a 19th century European novel about homosexuality , written in Portuguese. Good way to start a romance. Growing excitement, anticipation, spectacular attractions on offer. But the animation continues:

Facing each other, the varieties and the CIRCUS price [...] everyone wanted a ticket [...] the profuse lighting of the two theaters gilded, revamped, lifted the varieties' octogenarian shoes [...] a man wandered [...] he was in no hurry to get into [...] this tortuous anxiety of someone who is fervently looking for someone [...] The crowd passed by, automatically [...] In their eyes [...] the obstinacy of a desire [...] strong animal concern, on the lips and jaws. The eyes [...] rested preferably on the beardless, slightly downy faces of the teenagers. He looked at them with a greedy and somber fixity (BOTELHO, 1982, p. 7-8).

We see that the 3rd person narrator works with a Freudian game of *fort da* (show/hide). It seems to observe everything from a distance, but imposes subjectivities, too. From the boys who passed quickly to those who stopped, in these the man “stroked them lightly with his arm; he touched his thighs with his cane, as if distracted; he was placed beside them [...] cautious [...] lest someone he knew appear and surprise him” (BOTELHO, 1982, p. 9).

We see that the narrator quickly set up an arbor of orgies, salable and forbidden. Man is called a “night owl hunter”, “tyrannized by a secret vice”, perhaps “fierce melancholy” (BOTELHO, 1982, p. 9). He finds a colonel who greets him: - “Bravo, baron!”, the Colonel left and the nobleman took a “boy , 15 years old, dark skin, reddish eye, insinuating type of marauder [...] ” selling “goodies” with her basket. When he saw himself being stared at, he approached: “ — Do you want pastries , customer?”. A “warm cinnamon and butter” smell rose (BOTELHO, 1982, p. 10). The baron insinuates himself, the boy walks away with a “contemptuous tone”. Friend Henrique Paradela appears . Such an appearance during the “ twirling mystery of hallucination of his addiction, shamed him, clarified his reason, gave him the measure of his own debasement” (BOTELHO, 1982, p. 11). We see here that the narrator criticizes this type of relationship from the beginning.

The Baron shows himself to be an individualist. “There are several ways to deconstruct, expand the individualist subject, in particular, through identities generated from gender, ethnicity and race, or even social class, nation and culture.” (LOPES, 2002, p. 175). All this adds to the narrative that moves like a whirlwind with a man at the center in an unconventional artistic, sexual and social frenzy.

The text makes it clear that heteronormativity is an inviolable axis. But the man says: " — I'm waiting for some boys... We agreed to come to the circus today... But they take a long time [...] — And Elvira?" asks Henrique's wife to the Baron. So we assume that he is married (BOTELHO, 1982, p. 11). Leonor says she's going to buy things for “the little ones” and a gift for a maid who's getting married “the day after tomorrow” and called her godmother. Here we have a sociological picture in summary. The woman said goodbye, sent the Baron to warn Elvira. “The day after tomorrow, don't miss it” (BOTELHO, p. 12). From inside the circus came the crack of a whip. Inside, the “function” continued “with the usual monotony”: Clowns, trapeze artists, dogs, horses, but “a monolithic Hercules and an acrobat boy, “ rekindled his pederast instincts” (BOTELHO, 1982, p. 13). It seems that the narrator criticizes and feels the same attraction as the character, paradoxically, [...] the hot dementias of pagan sensualism. Both virile and sweet [...] it hypnotized him [...] black velvet eyes” (BOTELHO, 1982, p. 14). The narrator insists when comparing the eyes and looks with the velvet. “Desire bit his nerves [...] crazy fascination [...] painful [...] Socrates was no longer entirely subjugated, in his first meeting with Alcibiades” (BOTELHO, 1982, p. 14)

By invoking Greece, the narration borders on the obvious, in the midst of what already brings to mind, the famous relationship of the ugliest old man with the most beautiful young man in Athens. The Baron attracts a young man with “big, strong and silky eyelashes” who lets himself be seduced by a few pennies, takes him to a corner, proposes things to him (which the narrator sees from afar and does not hear for the first time), seems to approach From the nerve center of this first chapter: “ — You're crazy!... I don't, sir!” It was raining. The two of them stayed in a corner under the same umbrella. The narrator says that the conversation was “ignoble” (BOTELHO, 1982, p.14). “Infamous project of seduction [...] the boy listened meekly, resigned”. Then the performance ends, the circus audience passes by. The narrator says that among the boys there are some with “well-built bodies” (we see confirmed the dubious attitudes of the narrative

focus). The Baron gives the boy a gold coin and says “don't miss it! [...] they separate: the pederast, light, proud, with hope radiating in his features; the ephebe, crestfallen, bending over a problem, touching the paving stones, grave, meditating” (BOTELHO, 1982, p. 15). The picture looks clear: prostitution for social reasons. But it is also essential to remember how homophobia began (1300-100 BC)

It is fair here to deal with the biases of this type of relationship, for money or by nature, and how a punishment was ardently sought for this:

Monotheism also had a code (the Mosaic law) that put behavior and “being” in the foreground, enhancing the impact of the acts themselves. In addition, the law also classified as abominable wearing clothes of two types of fabric or sowing two kinds of seeds in a single field – as well as sexual acts between people of the same sex. Finally, the number of situations or acts that could lead to someone being excluded (temporarily or permanently) from the people of Israel was equally eclectic: having defective testicles; being an illegitimate child; suffer from eczema; have nocturnal emission; live in a house with dampness or woodworm. Male prostitutes were often castrated and participated in ceremonies displaying their androgyny and effeminacy. It is quite possible that aversion to homosexuality (or at least its “sacred” version) explains in part why the Bible forbids eunuchs from participating in public assemblies (Deuteronomy 23:2) or transvestism (Deuteronomy, 22). :5). Like the Levitical regulations, the story of Sodom must be understood in this context. It is the main biblical account outside the scope of the law that presents opinions about homosexuality. To demonstrate that the main reason for the destruction of Sodom was homosexuality we would have to interpret Ezekiel's "abominable things" as alluding only to homosexuality and thus ignore everything Ezekiel enumerated first. Also, knowing the Hebrew literary method of making a statement and then repeating it for emphasis. The first sentence as the main clause and the second as a reformulation of the first. The Flood was also justified in part by sexual acts (NAPHY, 2006, 39-40).

It is in the light of so much horror and phobias that spread like social cancer that we delve into the reading of Abel Botelho's novel. Knowledge of diegesis can be practical or theoretical. The behavior of a scholar in front of the Portuguese naturalist book *O Barão de Lavos* reminds us, as always in literary fiction, that there is an animal life, a political one, an artistic one, and that we must, at times, observe the cultural environment interrelated with the work and that, given the literary fact, we can adopt 5 types of behavior: 1) that of a reader interested in understanding the work; 2) that of an analyst, interested in breaking down the work into its elements, with a view to a deep and rigorous understanding of its form and content; 3) the historian, interested in determining the situation of the work in its historical system; 4) that of critic, interested in judging the work, even a very old work, according to scales of value, such as artistic, moral, intellectual, as we are doing here and complementing this with a theoretical look interested in extracting from the work and of everything related to it, general ideas, and to elaborate these ideas with a view to formulating a quasi-theory about what is essential in literary phenomena, remembering that the Theory of Literature has as its object of study, all literary facts. We have to define ourselves: analysis, historiography, criticism or literary theory, we are left with the latter, because it deals with all literary facts.

Let's go back in time once more to follow historical footsteps that lead us to further clarify the researcher interested in the topic.

The last great “Roman” (Byzantine) emperor, Justinian (AD 482-565), introduced the first laws designed specifically to prohibit all types of homosexual relationships. In 533, he placed all

homosexual acts under the law that punished adultery (with death). In 538 and 544, other laws urged all homosexuals to repent of their sins and do penance. Those who continued to be “practicing homosexuals” (to use a current expression) were to be handed over to the mayor (magistrate) of the city.[...] Shortly afterwards, the emperor ordered that all those found guilty of homosexual relations be castrated. [...] From then on, those who felt desire for other men lived in terror (NAPHY, 2006, p. 92-93).

After weaving such observations that lead us to compare times and values, between nobles and commoners, we will start with the genetic structures of the novel *O Barão de Lavos*, its aesthetic-literary categories that condition the work and allow our understanding. Let's establish our method. The theory at this point is not propaedeutic, we can only resort to it, knowing that what concerns us now would not be to use it in the analysis of the structure of the work itself. We do not seek dogmatic, judgmental rules.

2 THE TWO SIDES OF THE COIN

Our study develops in two levels of work. One of a scientific nature (research, analysis of literary facts), another of a philosophical nature (formulation of working hypotheses and theories about the results of this work).

The theoretical knowledge of literary facts is based on the following principles: 1) the creative act, reactions of the reader, this not without literary analysis, nor historiography, nor critical treatment; 2) the theoretical study itself, the form, the work and its influence on the public; 3) speculations about abstract realities of literary life (based on scientific knowledge); 4) objective analysis of the psychological act that created this work, a “trend”, “literary fashion”, as they used to say, and literary analysis; 5) as the theory of literature is a discipline *in progress*, we want to understand its evolution, its current study, its perspectives. Always remembering that our primary object is the work, the secondary ones are: the cultural environment of the work, the writer, the reader, the public and the literary history of which it is a part.

The public is not only the sum of readers, but also a collective entity, a social group with its own peculiar behavior. However, we can take as an object of study of literary theory its relations with other literary studies (criticism, analysis and literary historiography) and with psychology, linguistics, stylistics, sociology, philosophy, history, aesthetics and ethics dialogue with the theory of literature, a science of the spirit whose object is the literary world created by man over the centuries; sciences such as it cover all domains of multimodal human activity. The theory of literature cannot aspire to the complete objectivity, rigor and exactitude that characterize the exact sciences and the sciences of nature.

In the psychoanalyst sense, in the second half of the 19th century, homosexuality was seen as a perversion, which appears in this novel, *O Barão de Lavos*, a conception that was not unanimous. “The homosexual perversion of psychoanalysis made the sad and pitiful guardian figure of the belle époque [...] an indefensible notion” (COSTA, 1992, p.85).

The question is expressed in this Portuguese naturalist novel. What would be the purpose? Depending on the theoretical point of view adopted, we can see Literature as a means to something or as

an end, as a sign of change or record of an epoch, as a symptom of the evolution – or not – of the human psyche or a trace of which it maintains itself. same over the millennia. This is not to say which theories are right or wrong, just to demonstrate that each part from a different theoretical point of view, and increasingly the starting point is not Literature itself, but Psychoanalysis, Sociology and Linguistics – to give names to the main theories of literary studies.

How to look at the year 1867 (of the narrative or 1888, of the author compared to the work)? We never want to say “that was the way it was in those days”, this is ridiculous in the face of iconic works of the lyrical, narrative or dramatic genres. We want to remember here that a literary study must be democratic, never elitist. The very concept of literature, reading and criticism should not stand between the reader and the work. We must eliminate this repression.

We think that Literature *could* be defined as writing, in the sense of fiction. Literature uses language in a peculiar way. The formal literary elements would provoke the effect of estrangement, or *defamiliarization* . Under the pressure of such artifices, common language is intensified, condensed, twisted, reduced, enlarged, inverted, renewing habitual reactions, making objects more perceptible. Result: intensification of our life. In this work by Abel Botelho, sex between men is pointed out as an aberration that fatally leads its practitioners to the most terrible decadence.

How to evaluate, on the other hand, the literary value of this work? Literature is not a stable and well-defined entity. Value judgments in this area are notoriously variable. The act of classifying something as literature is extremely unstable. Interests are constitutive of our knowledge. Naturalism sought to make the pathological study of society in an intense social critique. *Value* means everything that is considered valuable by certain people in specific situations, according to specific criteria and in the light of certain objectives. What values do we find in the novel *O Barão de Lavos* ?

Literary value judgments can be subjective and self-serving. There is a close relationship between them and social ideologies. But do we interpret Literature, to some extent, in the light of our own interests? Is our reading of *O Barão de Lavos* today similar to that of the late 19th century, when it was released? Or are literary works rewritten, even if unconsciously, by the societies that read them? What about a person who believes that sex roles have roots only in human biology, as the narrator of the aforementioned novel does?

The beautiful, in Greek tragedy: it was not convenient to show “good” people passing from happiness to misfortune, nor bad men passing from crime to prosperity. Analyzing the character of *Baron de LAVOS* , trying to define him in terms of our ideas, knowing how abstract the essence of the creative act of this work is, is what interests us. The creative process that produced this work was inside Abel Botelho, it became a portrait.

Another literary fact that we are looking for is the reader (after the author and the work) in his effort to understand (here we will launch our hypotheses, nowadays). There are no recipes for a perfect novel, but creative freedom in this area has its inventive power under the technical aim of an industry that now has a

technology never before achieved and we do not want to despise everything that we are witnessing in the world when analyzing this book that focuses on points that interest us: heteronormativity , homoaffectivity , the issue of pleasure. If we look at how matters were treated in antiquity, we will see remarkable facts such as:

Christianity (along with Judaism and Islam) has traditionally valued procreation over (if not to the exclusion of) pleasure. Indian culture does not have it – understanding rather that pleasure (kama) finds “its purpose in itself”. Pleasure is an end in and of itself. [...] The culture of India, in its many social and religious forms, seems more interested in emotion and love than in the mechanics of procreation. [...] Thus, masculine and feminine are not distinctions of essence, but categories “created by society” to which certain roles are assigned (NAPHY, 2006, p. 45).

In this conception, it is possible to perceive that the sexual act was commonly directed and explained more for the purpose of the reproduction of the species, something that reverberates until today in some communities, excluding the human capacity to feel pleasure, through the *climax moment* , provoked by the junction of two self-conscious beings entwined in the movement of sensations called eroticism, a concept defended by Bataille in his work *Eroticism* , discussed later in the body of this book.

3 HOME OF THE PEDERAST

“Good evening, Vivi”, the baroness read *Madame Bovary with interest* . The second chapter couldn't start more interestingly. He kisses his wife “mechanically”. The narrator chooses modern words. The wife, with “ruffles on her tiny forehead”, smiled at her husband with “kind indifference” (BOTELHO, 1982, p. 18).

Neither Eça nor Machado struck such a precise and comprehensive blow. *Madame Bovary* , reads the pederast's wife. We already know what's coming, but the linguistic game is tasty, in the sense of Roland Barthes, in *The pleasure of the text* .

What a book, this one!... – exclaimed the baroness in a deep admiring accent, resuming with delight the interrupted reading [...] I have never read anything that touched me so much!
— Do you know who I saw?... [...] Os Paradelas .
But the baroness, cutting right away:
— Yes, yes ... but let me read” (BOTELHO, 1982, p. 20).

The family is displaced from the usual axis that moves the entire system. The wife reads Bovary and the husband made an appointment with an underage boy, he was going to buy him sex favors. The narrator will examine her, introduce her to the reader: “a delicate woman”, small , fragile, spicy [...] (BOTELHO, 1982, p. 20). We note that the fetish surrounds this narrative. A certain appetizing thing “light and frivolous. Big eyes between gray and green” (BOTELHO, 1982, p. 20), the narrator pulls us to look closely at that woman on the chaise-longue. The eyes

[...] an all-nothing metallic [...] translucency dry and healthy [...] imperceptible, thin nose, raised at the base in a rivet [...] like a provocative, between malicious and haughty [. ...] the forehead, clear, smooth [...] there was no news of the passage of a serious thought [...] of a just notion of duty [...]

by the curve of the face, of a crass milky whiteness, the sinuosity of a very tenuous vein rose on either side of the chin to the springs (BOTELHO, 1982, p. 20).

The final superlative seems to us to be an important conclusion to the linguistic game in progress. But the Baron is the protagonist, and not this lady, exposed there, in “a fascinating combination of youth and grace, of petulance and pampering” (BOTELHO, 1982, p. 20). If we were to compare her to Miranda's wife, in *O Cortiço*, we would see with what difference the adultery will be consummated. For now, the Baron (we don't know his name, yet) “brains and hands on fire”, savors the relief of arriving at that “little house” (a small palace, it would be better to say) (BOTELHO, 1982, p. 20). “If the senses were normalized, the soul continued to struggle in a painful exaltation. That silence was exasperating. He wanted to talk, but “Vivi” said this: “Haven't you been there without me so far?... because it lets me read” (BOTELHO, 1982, p. 20). The linguistic marks are repeated from the first lines: the use of exclamations and interrogations leave the reader in a kind of vacuum that creates an affected rhythm, in a way, in the narrative.

The narrator, still about Vivi (Elvira, who married for her mother's interest and had no children), reveals to us:

[...] his mouth was creased at the corners, very acrid, and the little veins of his face were slightly thickened purple [...] there is a screen, with five panels, of black satin, soberly embroideries of wading birds, hair grasses and fine flowers [...] delicate fantasy [...] old porcelain [...] a grand piano on a platform [...] paintings [...] in the purest style (BOTELHO, 1982, p. 20).

Again a superlative in the narrator's speech. The description of some rooms in the house, described in detail, seems to be made to characterize the couple, the social class and prepare the reader to follow the drama of the wives, a kind of duel is announced.

The bored Baron hears Vivi say “there are the newspapers to read” (Ibidem, p. 23). He chooses *Gazeta de Portugal*, in which he collaborated. “Very far from each other”, he “in addiction”, she “poisoning the senses in *Madame Bovary's dissolving tragedy*” (BOTELHO, 1982, p. 23).

In the semantic field, expressions such as “poisoning the senses” (she), “ derailing her addiction” (he) abound. But it is still the Baron who is in a worse frenzy than that of Ema Bovary. From the wife we do not have access to what he aspires to, yet. The narrator makes a comment: “It was logical, it derived naturally from nature; from the education of the conditions of connection between the two this mortifying situation” (BOTELHO, 1982, p.23). We know then that the Baron comes, by “double bastard grafting” from two of the oldest and most illustrious families in Portugal and signed “D. Sebastião Pires de Castro e Noronha”, a nobleman with a *pedigree*, but of a lineage impregnated with vices.

Here we could establish one of the pillars of our theory about the texture of the novel, with regard to the narrators, an essential characteristic of this genre, a fundamental element. We can talk about form,

content, style, not yet about the author, but we can already say that Eça paved the way for Abel's Naturalism, later to Realism. The reader, the public, the cultural environment were already folded, but now the lens turns to the physical attraction between men. And there is a wife at work.

One of the characteristics of the literary work is the type of reality that it conveys: intuitive and individual knowledge, the knowledge that each one of us has of facts and things. We know what goes on inside us (feelings, ideas, imagination) and around us (people's behavior, natural and social phenomena, etc.). The same occurs with the writer, and so we say that his work (like any work of art) expresses his individual and intuitive knowledge of reality.

We cannot forget that when reading a novel, such as this one by Abel Botelho, what characterizes a literary work is, in principle, its content, similar to the common content of people, but which is distinguished by being the result of a deeper and original of reality.

In the literary work, the rules of expression are those created by the artist himself. Content and form distinguish the novel *O Barão de Lavos* as one of the most provocative works of Portuguese literature in the last frontier of the 19th century. Because? Let's investigate.

When elaborating on the figure of D. Sebastião, what an irony to call the Baron he created that way. Botelho does not seem to use subtlety when dealing with his subject. What begins to throb from the beginning of the work seems to border on obviousness without camouflage, although there are prolonged digressions such as the one used to narrate the Baron's origins 300 years earlier. When a Castro kidnapped a virgin, he laughed at a mass and publicly distrusted the Jesuits (1541), in the days of King João III.

Literary theory has been studying the issue of narrative focus diligently. The resurgence of certain aspects has proven effective, at times, as in the narrator's digressions. Machado de Assis gave examples of this in his *Memórias Póstumas de Brás Cuba* and in other works. When delving into the Castro's "romanesque mancebia", defying King João III, at the time of the "outbreak of the sinister autos de fé", the narrator was perhaps using cunning, planting something to harvest later. This is how the 6th grandfather of our Baron de Lavos was generated. Here comes a key: atavism generating the "constitutional vices". Let us remember that scientism was at its height in 1888, the year in which the work was written. The "crazy instincts of pederasty" would have been "inoculated and progressively aggravated in Portuguese society by the ethnological modalism of its formation. The sexual inversion of love, the cult of ephebes, the preference given over women to beautiful adolescents, came to us with the Greek and Roman colonization" (BOTELHO, p. 26).

According to the narrator, pederasty was "an obscene invention of Ganymede, a Trojan prince of wonderful beauty [...] a trivial vice throughout the East" (BOTELHO, 1982, p. 27). Note the contradictory game exposed with the word "wonderful", in the excerpt highlighted above. There are no limits to the exposition and the narrator draws support from Vaschkala, one of the Rigueed Upanishads of Indian mythology, when Indra himself abducts the young Medhatithi. Returning to the Romans, he says that the "veil of friendship covered the most infamous blunders" (BOTELHO, p. 27). It seems a text more to attract

than to repudiate such instincts. Reciprocity in sensual enjoyment was the best bond for the hearts of two friends” (BOTELHO, p. 27). This Roman heritage, through a “cruel transfusion” (the narrator always uses superlatives) took place in the Iberian Peninsula under the influence of the colonizers, in the “druidic twilight of its forests” (BOTELHO, p. 28). It looks like a baroque game, language used in the creation of the text. Something permeated by an evident ambiguity; this homoaffective practice is also mentioned as an Arab heritage, the “strong approximations”, the unavoidable demands” among men, far from women in the “sensory perk of the flesh”. This is to talk about how the Baron's 6th grandfather was born, in a heterosexual *affair*. Since the “first cardinal” pederast “lowering his contrite eyes before the images of the avenging God” (BOTELHO, 1982, p. 28-29). It seems the Baron represents only evil. When reading *The Literature and Evil*, by Georges Bataille (1989) we can notice that evil is a recurring theme in literary works and in this way my interest in this study perspective was consolidated.

Freud, in *Civilization and Its Discontents*, comments on the purpose of human life, a question raised several times without a satisfactory answer:

[...] if it were shown that life "has no" purpose, it would lose its value [...] we have the right to discard the question [...] only religion is capable of solving the question of life [...] men want to be happy and remain so [...] this is the principle of pleasure. This principle dominates the functioning of the psychic apparatus from the beginning (FREUD, 1996b, p. 83-84).

When analyzing the character of the Baron, the narrator rubs him with the social phenomena of that space and time. The tour ends to talk about the Baron's childhood, at the age of ten, in high school, when his father, already old, leaves Lisbon to live in Lavos, Sebastião will be educated by Jesuits. The boy was studious and liked to “pick up the beautiful side of things” (BOTELHO, 1982, p. 30). He exchanged “ridiculous” primers, “hasty copulation rehearsals in the bathrooms”.

The descriptions of the agonies of the young Sebastião's homosexuality are made by a narrator who seems to understand a lot about the subject, even when he treats masturbation as “seminal evacuation caused by himself”. At 16, the boy leaves high school for an outside life. Black eyes, narrow shoulders, “wide basin” (BOTELHO, 1982, p. 30-31). He continued in Lisbon, studying at the Polytechnic, away from his father. No mention of his mother. At 20, Sebastião preferred girls to boys. The narrator uses exclamations to talk about the taste for the ineffable, in the incursions into art, the focus of the young man. The narrator praises the painting showing the nudity of Antinous, the emperor's lover (BOTELHO, 1992, p. 33). This reminds us of some aspects of the struggle for such “passions” between equals:

Sexual acts (from masturbation, through fornication, adultery and homosexuality, to bestiality) are simply condemned as sterile, unnatural and sodomic. There is no evidence of a hierarchy of sins with homosexuality at the top. On the contrary, or as far as we can tell, adultery and incest were considered the worst sexual sins imaginable. Thus we see the Council of London (1102), explicitly demanding that sodomy be confessed as a sin. Interestingly, St Anselm (1033-1109; Archbishop of Canterbury) simply refused to publish the decree, saying in a letter to one of his archdeacons and close friends: “This sin has hitherto been so public that hardly anyone is ashamed of it, and could therefore have incurred it because he was ignorant of its gravity”. The sin could be serious but St. Anselm seems to have shown little interest in taking effective action against it. Furthermore, the

decree of the council must be seen in context. Before the Fourth Lateran Council (1215) stipulated annual confession, most Christians confessed their sins only once – in the safety of their deathbed (NAPHY, 2006, p. 98).

In *The Baron of Lavos*, the main character traveled through Europe and enjoyed works depicting handsome young men, in the Louvre and other museums. “In 1860, his father died” (BOTELHO, 1982, p. 34). Only child, inherited everything. The “debauchery began, the “physiological deviation [...] was afraid” (Ibidem, p. 35). He married the daughter of a cloth dealer, Elvira, a “lightheaded and ignorant bourgeoisie, futile, not having the strictest understanding of morals [...] narrow intelligence” (Ibidem, p. 35). She was not looking for a “male”, she wanted to marry the noble D. Sebastião and she did so, going to live in the mansion, satisfying her bourgeois aspiration. When we meet them in the first chapter, they had been married for three years.

Literature is a form of knowledge, understanding applied to man and his relations with the universe, to his struggle for assimilating this universe, a way of knowing. In the novel *The Baron of Lavos* this is portrayed, we see the imitative fiction, the laborious, almost impossible reproduction of the interior landscape that makes up the kaleidoscope of the characters. Abel Botelho sketches a devastating interior panorama of a repressed homosexual subject, seen from the perspective of a society that denied him. It is not a photographic copy, but a tendentious deformation, a fusion of planes, enlargements, exchange of vibrations and effluvia. There we see that artistic knowledge seems unchanged since the most remote times: Botelho uses the weapons of intuition, these have been complicated over time through artistic expression. The senses have not gained new sharpness, the techniques are what sharpened in creation, we are talking about literature here, it is the creation of a supra-reality with deep, singular and personal data of the author's intuition. The aesthetic emotion comes from the harmony between the originality of the background or the set of new intuitive data and the expressive relief of form. The social and individual framework exposed in this novel is something that demands attention from us today.

The third chapter announces that an “acidic embarrassment”, “annoying”, a “rebarbative turmoil of displeasure”, a uneasiness of dispute “overshadowed that conjugal atmosphere in the appearance so calm [...] the storm was rapidly building up [...] a spark of hatred would spark” (BOTELHO, 1982, p. 38). The use of alliteration in the rest of the text makes us think of the search for a sound effect to join the other resources that the author makes use of, such as the rhythm, somewhat dissolute. But “domestic decorum” is maintained, with reservations, such as the one we saw in chapter one, when Elvira prefers contact with *Madame Bovary* to talking to her husband who has arrived from a fiery evening.

The next morning the baroness, with her “plump and fresh little body”, looked at the women and gave orders to the waiter, avoiding the gaze of her husband, who also did not want to meet her gaze. The narrator describes the environment, clothes, props and bodies of the characters in detail. Although we have a moralistic narrator, the observations remind us of someone who knows the *metiér very well*. We don't have descriptions as specific as the one below, but subtly we could find something similar:

Some practice the perverse act of sodomy by rubbing their penis with their hand (masturbation, mutual or solitary); others rubbing it between the thighs (intercruel sex) of young people (teenagers), which is what they do most nowadays; and rubbing around the anus and introducing the penis into it in the same way as it is introduced into the sexual parts of a woman. People knew what men do to one another. That some important figures of the time had relationships with other men (and women) was also well known. Thus, the amorous adventures of Richard I, Heart of the Lion, King of England (1157-1199), for example, were the subject of much comment. His first known affair (as Duke of Aquitaine) was with Philip II, King of France (1165-1223): They ate every day at the same table and from the same plate, and at night their beds did not separate them. And the King of France loved him as his soul; and they loved each other so much that the King of England (Richard's father, Henry II) was absolutely astonished at the great passion between them, and marveled at it. The Third Lateran Council (1179) specifically prohibited "that (fornication) which is against nature." Any priest caught in the act of sodomy would be stripped and confined to a monastery for life, while lay people would face excommunication and social exclusion. A royal edict of Castile said that "whoever commits this sin, once proven, both (must) be castrated in front of the entire population... then hung by the legs until death" (NAPHY, 2006, p. 99).

Leaving the historical-scientific side of the text above, and its technical-academic details, we see in Botelho's novel a *belle-époque lyricism*, when, for example, he describes the *first roses of the season*, picked in the garden, serve as a narrative counterpart to frivolity. of the woman, malice, in front of her husband who is in a tailcoat, she in a "cashmere robe the color of grain, decorated with cream lace" (Ibidem, p. 38). Her "sour eyes" do not help the reader to take her side in general events. The narrator is calculatingly manipulating the issue from the point of view and the various possibilities of the 3rd person in the narrative pole. "— O daughter [...] — Well! Nothing else was missing. Now call me a child!". The Baron "gave the woman a stern look of reprimand" and she looked at the ceiling "with a provocative stamp of foot. An elastic and feline trepidation ate his lap" (BOTELHO, 1982, p. 40).

He wants to go out alone, refuses her proposal to go together. She says she would rather not have married someone who doesn't love her. She says she thinks she's a stupid and docile housekeeper to "sew on the buttons of his underwear". Interesting detail: she talks about her husband's underwear at this moment. "The canaries of the beautiful golden nursery had burst into a chirping mockery" (BOTELHO, 1982, p. 41). How many signs in rotation at the same time! A cornucopia narrator fills the reader's mind with plenty. He slams the door on his way out and she goes to "bury herself in the chaise-longue", "crying", "shivering" in her impotent rage, the "poor creature" suffered that "affront" like "the slamming of a tombstone" closing the tomb" (BOTELHO, 1982, p. 42). Abel Botelho: a master of letters with almost 400 pages more to outline his opinion on homosexuality and adultery in a conservative society, but he does not dispense with cynical synthesis, as in this construction: "He had undone it, thrown it to the sidelines like a point cigar", she ignored the reason (BOTELHO, 1982, p. 42).

The narrator does not describe their situation in bed. Did not focus on this point. "The tears were crying drop by drop" (BOTELHO, 1982, p. 42). Simplistically tears don't cry, of course. "Despised, humiliated!", indirect speech – free reigns. The wife begins to draw analogies between her situation and that of Ema Bovary. "His mouth opened in a panic" (BOTELHO, 1982, p. 43); soon recovered her great confidence in her husband, then a character enters the plot: Doroteia, a maid, from

“[...] rogue curiosity”, “mouth torn from ear to ear [...] squashed nose – asking:
 - Did you call?
 - Not me, woman [...]
 - I wanted to apologize, it seemed to me - he ventured [...] do you want something? [...] I am your friend [...] I have served in Lisbon, before that, 6 houses [...] the husbands left [...] the wives went to the window to face others.
 - Don't say that, woman! (BOTELHO, 1982, p. 43).

We also notice popular expressions from Portugal at that time and class such as “Tó rola”, used by Doroteia to criticize the baroness for not reacting at that time. The maid, when asked about the time, says something like this: “Lisbon clocks have two hands, I don't know why... In my land, the clock in the church tower has only one hand [...] and we govern- if with him, and regulates very well... now this two is a mess” (p. 46). We are in 1867 and the representation of Portuguese society is implacable. When dismissed by the baroness, “she shot the bitch in the eyes [...] you are like the most!” (BOTELHO, 1982, p. 46).

For Bataille (1989) man differs from other animals: he is guided in society by interdicts, what is prohibited, illicit or immoral. About interdicts Bataille states that they have a dual nature, since each society has its idea of what are considered immoral acts. The author affirms the need to circumvent the interdicts, but never disregard them in their entirety. Evil is not only a means for the self-satisfaction of the damned, but of the moral being as well, as we see below “In this way, Evil, authentically considered, is not only the dream of the wicked, it is in some way the dream of the good. .” (BATAILLE, 1989, p.18). Regarding the transgression of interdicts, the author points out that man needs courage to transgress moral laws, but that when acting against them he will feel a sense of accomplishment and ends by comparing the act of transgression of man in his society with the transgressions represented in literary works. , since it is inorganic and thus can say everything (BATAILLE, 1989, p. 22). Prohibitions and transgression would be inseparable, because for there to be transgression it is necessary to have laws, however, prohibitions should not be ignored but violated. The literary text would thus be a kind of violation of interdicts. Botelho brings us something of this violation, at least by exposing the fundamental laws of the Lisbon society of his time. What we read in his work is that evil is not present in choices and attitudes that have their origin in taking material or personal advantages, such acts are selfish, but evil is not exactly the desire to take advantage of something.

Chapter III has about 25 pages that include a romantic description of environments, such as the garden (plants from the tropics, etc.). The interdiscourse with the novel *Madame Bovary continues* , as we observe Lisbon through the eyes of Elvira, who wants a Rodolfo, similar to that of Ema Bovary (black velvet jacket and white knit shorts and knee-high boots, mounted on a superb black horse).

The Baron was in the Grêmio, not even the risqué scoundrels of French literature, that of the boulevard , which he tried to read, distracted him. A tour of Lisbon follows. He went to the apartment he rented for furtive meetings, in whose “mercenary interior there was not the slightest emotion of family life” (BOTELHO, 1982, p. 49). Here we have a peculiar observation, the bread and fire that characterize a home were lacking. This at a time when homosexuality still held something that could lead someone to a terrible

punishment. The Baron discusses part of the study he had been working on for a long time, and here we present part of our research on the subject:

During the Black Death, Europeans tried to explain why God had punished them so horribly. Many groups began to be singled out as scapegoats. [...] with the help of preachers and moralists it was easy to see that the wrath of God was provoked by sexual immorality. Two groups came to be in the line of fire (literally, at the risk of going to the fire): the sodomites and the prostitutes [...] these groups became the biggest threat to society, the cause of all ills and problems. The solution was eradication. Europe wanted to erase the last vestiges of classical polysexuality or the licentiousness of the high Middle Ages [...] until very late in the 15th century (and in many cases, until the 16th century) brothels were an accepted – and legal – element of the public panorama. The brothels were built with public money and run by a “madam” (often called an “abbess” or “queen of prostitutes”) appointed and sanctioned by the state. Thus, in 1447, Dijon erected a grandiose building to function as the city's brothel. It had quarters for the manager, a spacious living room, and nearly two dozen large bedrooms, all with stone fireplaces. This city of 10,000 souls was very well provided for, with more than 100 legal prostitutes (NAPHY, 2006, p. 105).

The Baron was thirty-two years old. The narrator gives you typical description of naturalism, which even includes acne, to compare how time has done its relentless work on your face. The boy arrives, barefoot, for the appointment at the exit of the circus (chapter 1). The detailed descriptions will continue throughout the narrative. Often excessive. The Baron stripped the 16-year-old boy's torso: “white lap, fleshy [...] plump pectorals [...] like ripe fruit [...] the Baron got inflamed [...] greedy kiss [...] fatal turbulences of sodomite”. Entirely naked the boy was ordered to stand on a dais; “the chest in milky white” (BOTELHO, 1982, p. 54 - 56). The Baron draws a picture of him, who had “the anatomical particularity he was looking for”.

Dozens of boys, women and girls had been there before, on Rua da Rosa, where the Baron would examine their nudity in the realization of his fantasy. There is the boy he saw and harassed, when he suddenly left the circus; to whom he had given a gold coin in advance.

“It is said that only words have a use, not sentences, but at the bottom of each figure lies a sentence, almost always unknown (unconscious?) that is used in the significant economy of the subject in love” (BARTHES, 1991, p.3).). the character of the Baron is cunningly constructed by the author through accumulations of small details such as particles that come together. Let's see your next steps.

He put down his pencil, his jaws “oscillated like a carnivore, he went to take the boy in his arms and took refuge with him in the dim light of the alcove...” (BOTELHO, 1982, p. 58). As we see there is no description of the sexual act, yet.

Pause, space, longer between paragraphs, an hour later, comes the dialogue between them. The boy says he has been arrested once, for “robbery”, he was innocent, he complains, “my freedom is worth more than bread!” (BOTELHO, 1982, p. 59). Again the word bread is mentioned in this passage as a sign. The Baron proposes to live there: maintained by him. “I am for whatever you want”, was his reply (BOTELHO, 1982, p. 60). The Baron orders a Miss Ana, who works in the ground floor shop, about the new tenant. It should be noted that sometimes the word Barão is sometimes written with a lowercase and sometimes with a capital letter (mainly in direct speech), as if the reader were allowed the lowercase “b” due to the intimacy

with the character. "She's your maid," says the Baron to the boy, giving him two more gold coins, ordering them to wash themselves well. "The pederast quickly descended the stairs, the light hurting his eyes led him to a certain regret, and he was engulfed in a thousand disastrous concerns" (BOTELHO, 1982, p. 61).

Form and content, fundamental elements of the literary work, in concomitance and unity, translate well the unspeakable of this somewhat vexing situation, to say the least, what is offered in the reader seems like a concrete reality, but it is not, it is just art, concrete. we have only the form of the work, its expression. Content is abstract reality that existed in the author's mind and comes to exist in the reader's mind, through the form and content exposed there (this separation is merely theoretical).

Yes, on average the chapters in this novel are about 25 pages long. In Chapter IV, secondary characters are described with almost pointless whimsy. Elvira and Sebastião are in public, with friends. The futility of the rich, mocking "Lisbon worldliness"; Falstaff was talked about and how "the world was dying between the brothel and the barracks" (BOTELHO, 1982, p. 80). On the way back, in the *coupé* (carriage), the couple fight, he didn't like to see Elvira getting intimate with Xavier da Câmara, a kind of high society stallion. He humiliates her, calling her a "fan" head. At home he tries to console her for crying, in bed, he was in the next room and came to her: "I love you so much, Vivi!" (BOTELHO, 1982, p. 89).

The reader reads, for the first time, about the couple in bed, where Sebastião exposes the "hyperthermia of his virility to the contact of that young and beautiful woman" (BOTELHO, 1982, p. 90). "Leave me," she said, to the "sensual contagion of her husband [...] — I beg you, go away. And the BARON lay down, but beside her [...] the two drowned in an intimate embrace – long, sighing, electric – the last harshness of the quarrel" (BOTELHO, 1982, p. 90). Yes, bisexual.

As we have seen: the form, expression or language is a concrete element, structured in the sense of constructed with words and phrases that we can read, analyze objectively. The terms that Elvira, the baron and the narrator use, weave the element that fixes the content and transmits it from the author's spirit to our readers. The content loaded and fixed by the form, on the other hand, is immaterial reality. Actions and characters created by the author's imagination come to exist for us, only in imagination. The meanings, there, are also immaterial.

In his "sinister andromania", D. Sebastião (sometimes he is called that, sometimes "Barão, by the narrator), in his encounters, with the boy in his apartment on Rua da Rosa, "lubriciously", many times, after a long "scene" with the boy (as the narrator says), the Baron would leave "broken, exhausted, stumbling, with weakened nerves, his eyes sore, his soul humiliated and gloomy" (BOTELHO, 1982, p. 91). The narrator attributes this to the physiological abnormality of that act. As we see the vocabulary selection, along with the combination of signs placed in volatile rotation, lead the reader to a certain frenzy of perverse curiosity. It is cited to

[...] the Baron's genital arrogance, his organic evolution to the maximum [...] appetites for penetration and possession that the man ordinarily feels towards the woman [...] however [...] an effeminate movement: his spirit sparked [...] the passivity [...] surrendering, being possessed, enjoyed, being female in short (BOTELHO, 1982, p. 92).

Here we are entering a psychological probe, which soon assumes the positivist character, pointing out that this was the end of the Baron's lineage. An “edema of moral nature, purulent, soft, growing treacherously without pain and without itching”. The subtitle of the work itself suggests this deduction (“Social Pathology”). The pathological ruin of the Baron, who inside saw his own horror... “in the obscene depth of his debasement, he came to despise himself” (BOTELHO, 1982, p. 93).

The “healthy movements” with his wife were disturbed by young men who blackmailed him. The months pass with the new boy, in the same “effervescence”, contrary to what happened with the others: “a strange love, “a sick obsession, passion cold as a mirror in the shadows” (BOTELHO, 1982, p. 95).). It is here to see how this can be analyzed in terms of instruments of the Theory of Literature: literature is a *non-pragmatic discourse* . This doesn't mean they can't be read pragmatically, does it? The idea of clearly distinguishing between the “practical” and “non-practical” ways of relating to language is far from being clear. Literature would be a focus on the way of speaking and not on the reality of what is said. It is a kind of self-*referential language* . Literature cannot be defined “objectively”. (EAGLETON, 1997, p. 1). There are ordinary people who regard “literature” as writing that looks “beautiful”. (EAGLETON, 1997, p. 14). Literature is not a stable and well-defined entity. Value judgments in this area are notoriously variable. Interests are constitutive of our knowledge. The act of classifying something as literature is extremely unstable. *VALUE* means everything that is considered valuable by certain people in specific situations, according to specific criteria and in the light of certain objectives.

In his famous study *The Practice of Literary Criticism* (1929), the critic Ivor Armstrong (IA) Richards (University of Cambridge) sought to demonstrate how subjective and capricious literary judgments can be. (EAGLETON, 1997, p. 21). There is a close relationship between them and social ideologies.

Do we interpret Literature, to some extent, in the light of our own interests? “Our” Homer is not the same as the Homer of the Middle Ages, nor “our” Shakespeare the same as that of this author's contemporaries. Literary works are “rewritten, even if unconsciously, by the societies that read them” (EAGLETON, 1997, p. 17). The claim that knowledge should be value-free is itself a value judgment. (EAGLETON, 1997, p. 17). What about a person who believes that sex roles are rooted only in human biology?

Here we see something that borders on tragic lyricism. The boy was a foundling, the result of sexual relations between a military man and a nun. At ten he left the house of mercy to work as a servant, maritime work, rowing, handling cables that had hardened his hands. He stole from his boss and fled to Lisbon (he came from Aveiros , where he was born). “Today in one neighborhood, tomorrow in another” (BOTELHO, 1982, p. 96), sleeping in the span of bridges or in places like that. He became a street vendor, earning tips. We don't know if the Baron was the first man she slept with. His name is revealed: Eugênio Dias Lebre, nicknamed: *the one marked*, by a scar near the armpit. He made a lot of money to “put up with” the Baron.

Eugenio had all the best, to his lover's credit. Even his speech was corrected, even though the Baron liked to hear the “plebeisms” coming from the lover's “cherry mouth”, with “a clumsy flavor” (BOTELHO,

1982, p. 99). The Baron wanted to turn him into a dandy and one day introduce him to his acquaintances, as a mockery of a PYGMALION .

Eugênio, who had an “ astonishing assimilative faculty”, drew up a plan to get by in life, through the “cynical” baron who taught him everything. The boy learned to use cutlery and other things from the world of the rich. For dozens of pages, the digressions continue: art, history, etc. Time passes and Eugênio takes on a life of its own. Sebastian suffers, but resists. People looked at him imploringly. But in chapter VI this situation breaks out: “Son, do not leave me! [...] do what you want!” (BOTELHO, 1982, p. 131). Eugênio says he has an affair with a Jewish woman named Ester, who has been “in her life” for six months. The young man wants to go to Sintra with her, the Baron goes with her.

Let's see, the form and content of a work, being different realities, can be theoretically separable, arise from the author's creative act, impose themselves on the readers, form unity, made aware by us together. The images of the Barão's mansion and his apartment with Eugênio jump from the artist's creation to the reader's recreative act, who composes them in his heart, where form and content are concomitant, interactive, interrelated realities. Literary theory has them as a unit, and when it separates them it is to methodize its reflections.

Elvira's mother, D. Jacinta, says that if what the Baron wanted was a slave and not a wife, "let him go to the blacks and get her!" (BOTELHO, 1982, p. 135). Complains about the son-in-law. The narrator takes the opportunity to turn the reader against her: “the armpit smoked a lot of sebaceous and forehead [...] in the large mass of the breast [...] soft [...] the chin, nose and broad face disappeared. face , of her congested [...] bearded matron's head” (BOTELHO, 1982, p. 137).

In one game, the narrator leaves us unaware of the Baron's trip to Sintra, with his boyfriend and a Jewish prostitute. Elvira freaked out, went out into the night in despair, came back depressed. The next day, the Baron invited her boyfriend to the house, to be received by Elvira, who is about to begin her revenge.

The narrative continues with digressions into art, as Oscar Wilde will do in *The Picture of Dorian Gray* , for pages and pages . Eugênio becomes assiduous and Elvira becomes intimate with him. Eugenio can barely read. Word is that the Baron is a sodomite. Until a close friend, Henrique questions him about Eugênio:

— Do you have with him...?
— No [...]
— [...] You know what they say [...] you're married.
And the Baron, getting irritated :
' What moralistic bores!' [...]
— Sorry ... (BOTELHO , p. 177).

There was the matter of Xavier da Câmara, who showed himself to be thrown at Elvira at a party, and even wanted to take Eugênio as a lover. The Baron was furious. High society gathers for Elvira's birthday. Too much luxury displayed in the far-fetched narrative, there. Suddenly, someone spoke out loud (Colonel): “I feel disgusted with these people who can like boys...” (BOTELHO, 1982, p. 190). The Baron

surprises everyone and draws attention, saying the opposite, on his wife's birthday. Everyone looked intrigued. The Baron goes on to say that males are more beautiful in nature than females, Xavier da Câmara did not agree with any point and the Baron replied: "Let anyone else disagree with my ideas... but you!..." (BOTELHO, 1982, p. 195). A fight starts, but it breaks up.

Elvira thought Eugenio was a soapy imbecile. The latter, with the money that the Baron gave him, rented a house for his lover Ester, the reader knows little about their relationship. The narrator describes the entire homosexual act with contempt and prejudice: the lover Ester knew that "the sodomitic origin came to her abundance" that Eugênio offered her "but he didn't care" (BOTELHO, 1982, p. 203).

For several pages the narrative yields to the Lisbon chronicle. The city is portrayed in a picturesque way, for example from pages 207 to 218, a June night in the City Center. The baroness begins to feel attracted to her husband's lover, he gets into a duel and is injured, which leaves the boy with more free time. Elvira thus begins to give in to Eugênio's tempting beauty. She thinks of adultery for "this handsome young man, primitive and blunt" (BOTELHO, 1982, p. 240). The baron asks that they call themselves cousins. The boy wanted to "possess, enjoy the baroness!" (BOTELHO, 1982, p. 242). The Baron did not notice, convalescing from the wound he suffered in the duel. Care in bed for lover and wife.

We have here the literary work as a (more or less arbitrary?) gathering of artifices in the use of images, rhythm, syntax, narrative techniques, in short, formal literary elements that would provoke the effect of "strangeness", or *defamiliarization*. Under the pressure of such artifices, ordinary language was intensified, condensed, twisted, reduced, enlarged, inverted, renewing habitual reactions, making objects more perceptible. Result: intensification of our material life, in the words of Eagleton (1997, p.42). The narrator from the middle of the book onwards delves more into the characters Eugênio and Elvira, but there are also excessive landscape/environment discretions. This one was with the baron for a season on Figueira beach. He wrote letters to Eugene, who mocked them with his lover Esther. I burned such correspondence, most of the time, without reading it. The narrator does not fail to opine on the side of convenience. We imagine that it must not have been easy for Botelho to publish his work so full of information about the Lisbon of his time compared to so many other cities and times.

For Naphy (2016), throughout history and around the world homosexuality is less common than heterosexuality (the attraction and sexual acts between people of the opposite sex). However, this is clearly a very real feature of the human species as a whole. The existence of same- sex people is, in other words, a natural component of humanity – it is a normal feature of the human condition. "We emphasize that Christianity has always had a very negative attitude towards sex in general" (NAPHY, 2006, p. 284): (Christian dichotomy between the spirit and the flesh), an explicit desire to "mortify" the carnal side, repulsion non-procreative sexual activities; Is this an extreme example of the imperialist propagation of Western culture and values in general, when the vast majority of cultures have recognized that homosexual attraction is only one facet of the human condition? Is homosexuality abnormal, unnatural?

Upon returning to Lisbon, the baroness gave in to adultery: “Eugênio touched the back of the baroness' neck with his lips on fire” and confessed “I love her very much [...] it's time, Elvira, let's go!” (BOTELHO, 1982, p. 271); the baroness gave in to “Eugênio's masculine audacity” (BOTELHO, 1982, p. 274). In “dialectical sum, the barones hesitated and became fixed again [...] it was dialectical fascination” (BOTELHO, 1982, p. 277). The baron arrived later, Elvira had had sex with Eugenio.

Society perceives the triangle. Elvira did not suspect her husband. This seems like a plot flaw until more than halfway through the book, but this ruse won't last long. Eugenio asks her for money, too, who had to sell many of her things to give him more and more money. He was filled with debts.

Elvira confesses to her mother that the young man has led her to ruin and blackmails her. The baron suspects she has a lover, something hinted at by the eavesdropping maid, Doroteia. “Marry, marry. What nonsense! Out of the capital mistake of his life! [...] life was for everyone to enjoy [...] lavishly!” (BOTELHO, 1982, p. 300-301). He thinks about sending his wife away and staying with Eugênio. But when he was sure that his wife's lover was Eugenio, that the two were having an affair, his life became hell. Here the narrator almost transforms everything into melodrama, but wins the naturalist aesthetic. He hatches a plan: he wanted to catch the two of them; his wife and Eugênio, in the compromising situation. He pretended he was going away and came back later, surreptitiously. And he saw it all: the two of them in the nakedness of the act. Elvira curled up at his feet, and he showed her a revolver and locked the door as she entered. Eugene ran away. The baron followed him. He ended up at his friend Henrique's house, to whom, in a state of shock, he told everything about his “secret” life.

Meanwhile, a friend goes to the baron's house and tells him that the whole town knew about her husband's affair with Eugenio. “Such astonishment struck Elvira to death. Crushed with astonishment and pain.” (BOTELHO, 1982, p. 347).

“A whole little mythology tends to make us believe that pleasure (and singularly the pleasure of the text) is an idea of the right [...] .30). We are here before the representation of hedonism, yes. The Baron only thinks of running away and, like someone who leaves a dirty garment, puts on a clean one. Refusing to go down to “judicial separation”, he notified his wife that he would no longer live with her. (BOTELHO, 1982, p. 349). The narrative leaps from one paragraph to the next of this climax and will become more and more bitter and scorching: after six months, we understand that the Baron has gone to live far away. “On his return, the baron was as good as new. Entire amnesia of the past. It was transfigured. He was now another character, a man from afar, a stranger, an ignorant” (Ibidem, p. 350). He decided to own a photographic studio and work on the artistic nude, but he did not find models.

In chapter XIV (p. 369) we know that Eugênio is going to make his debut as an actor in an operetta. He had spent time abroad with a woman from whom he had “sucked contos de réis”. And the night of that premiere comes. He came in with a tight jersey, sang and was applauded. He had become famous for his scandalous affair with the Baron and the Baroness. The Baron gave a standing ovation and went to all the performances.

Carnival comes, the “Entrudo”. The baron took another boy to a cheap hotel to have sex. After the act, he asks: “ —Has no one ever done this to you? To which the boy, who replied, buttoning himself up: — Just yesterday... a priest. It was black” (BOTELHO, 1982, p. 350).

Typical of Naturalism, the description of the act is made in a shocking way and the narrative loses vigor, slowing down: “the baron’s life drags on, torporous and dreary [...] madness and childhood” (BOTELHO, 1982, p. 382). The main character let his passions dominate him: “he had the corruption of the century in his soul” (p. 582). The anti-hero is identified as lonely, selfish, unoccupied, without a family: “hungry to enjoy” (BOTELHO, 1982, p. 383). The only thing he kept was his precious *O stamp. abduction of Ganymede* , the only thing left from the collection of the old mansion.

His food came from his friends. His friend the Marquis gave him an allowance. Even so, the baron asked one and the other. He sneaked through the streets only at night. The narrator speaks of an “erectism crisis” or even “the last contortions of his sinister tarantular ” (BOTELHO, p. 388). Serious problems with the kidneys, chest, intestines, tendons, tingling, gastric crisis, bilious vomiting, sciatica, diabetes. He fainted, couldn't control his body, didn't feel his feet, in short: total decay. The clinical picture indicated paralysis and death. An ordeal. At the same time , he was tormented by priapism , bulimia, “seminal spills [...] like an ape, he masturbated, he began to prostitute himself, he thought about begging. He was in epileptic fits of pain and despair. It was man's sputum.” (BOTELHO, 1982, p. 94)

If the character Eugênio only reappeared in a small passage, after almost a hundred pages, the same happens with the Baroness Elvira, who only reappears in the last chapter, the number XVII: remembering the “all animal passion” for Eugenio, already overcome. She rekindled her friendship with an old boyfriend, and continues in this “discreet and sweet” affection. He was forty years old (BOTELHO, 1982, p. 408).

Later, in the last pages of the novel, the baron appears “an old man”, thinking of suicide. He died mocked by some boys, the old baron on the street, “an old man, withered [...] it was a policeman to help [...] he imagined a drunk, he faced a corpse”. (BOTELHO, 1982, p. 415), are the final words. And then comes the time the author spent writing the book: “March 1888 to May 1889”.

4 THE BARON'S DRAMA

The *Baron de Lavos* catches us in the midst of a whirlwind, a tangle of threads giving knots that are almost impossible to untie, overlapping images of a humanity that both in the West and in the East, both in ancient and newer civilizations of a subject considered taboo. Let's think about the following examples, some of them with data provided by Naphy :

Around 1900, another Zulu chief followed Chaka 's example , ordering his soldiers to abstain from sex with women. “ Nngoloza ” Mathebula (1867-1948), also known as “King Nineveh”, led a resistance movement against whites in South Africa. Older soldiers (*Ikhela*) were to choose teenage boys (*abafana*) as “boy-wives” (*izinkotshone*). When he was arrested and tried, he said that homosexual acts were common among his warriors. [...] Two features of the colonial mentality further complicate attempts to identify the presence of homosexuality in Zimbabwe. First, although

they wanted to control the sexual behavior of whites to avoid scandal, the British also had a tendency to avoid public debates about the sodomy trials (NAPHY, 2006, p. 237 – 240).

Let's go back to Botelho and his work. We know that form and content are together in the author, not in a profound way, as he strives to express the (emotional?) state that dominates him in intuition and creative technique. But there is something unspeakable there. Thus, the work triggers in the viewer a complex system of reflexive reactions, different to each one of them.

5 CONCLUSION

In a language with extremely far-fetched passages and others simple and direct, we have the portrait of a character that borders on caricature, due to his affectation, forged by the partial narrative when dealing with certain problems of homosexuality . It gets to the point where the wife, described as “ bourgeoisite ”, will present her weapons. If Eugênio, the “ephebe”, has already foreshadowed his outbursts, now it will be the voice of the character Elvira to express what she came for. What are the author's intentions in taking the narrative to this level?

Let us reason: the content of a literary work (and its form), what is in the lines, between the lines and what is silenced, all this also deals with the undefinable and the unspeakable. The fiction writer strives to express what he says and not what he wants to say to the reader. He says so, but the literary phenomenon is more than that.

The characters' attitudes produce a reaction in us: “how do you say that? What's that? Because? These are questions that we are asking ourselves, as readers. To what extent is what we read not what we have in us? We can find in the work moments similar to certain memories of our own, about ourselves or others we know. The drama of the Baron and his wife is closed in a perverse triangle, under the eyes of a society that deals very badly with this very complex problem called homoaffectivity , which, as far as is known, is timeless and universal.

The written novel is a material reality, a concrete fact that, when read, will transform itself in us into an abstract reality. The basis of the narrative is the linguistic structure (written or spoken). The writer varies the expressive structure of the works, this structure can be very varied, as for the levels of expression (popular, erudite, etc.) it sometimes depends on the type of content the writer wants to convey. Ariano Suassuna in his comedies sought the structure of popular speech, he did this with an effective technical effort to make the reader feel and understand his work. Abel represents the spirit of his time, the language of his time, the concern with the stigmatic “Social Pathology”.

Our literary analysis focused on the structure of the work, verifying how the author worked with the linguistic materials. It is not just grammar that matters, but the manipulation of these linguistic materials, as in any literary work, which will also give value to works such as this one, *O Barão de Lavos* , where writing blazes with devastating and acidic excitement, the to enjoy and suffer, in the tail of instincts, in the


“fever of burning lust”, to quote an expression of the author who thus inscribed his name in the list of classics of Portuguese Literature.

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CHAPTER 101

The theory and practice movement in teaching learning: Lesson Study in the graduation and professionalization of Mathematics teachers

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ABSTRACT

This essay presents an analysis of the qualitative methodology used in research in Education, and particularly in Mathematics Education, from perspectives focused on research in Teacher Training and Teacher Professional Development. The theoretical contribution that underlies this chapter is

guided by the investigations of Marli André, Bernadete Gatti, Dalila Andrade, Lee Shulman and Carlos Marcelo Garcia in order to understand the intentionality of the educational matrices that permeate the theme in the intricate subject/object interaction. In the analysis developed, based on a bibliographic review of a qualitative nature, the articulation between the highlighted lines of investigation: teacher training and teacher professional development, is configured by processes that intertwine in the trajectory of teacher professionalization, which is conceived as a means of constructing the identity of teachers and professors. Professional development considers not only the intellectual aspect, but also the different ways and languages through which subjects learn and build their identities, their ways of being in the world, in contact with other people, with the environment and with society. . In this sense, our proposal is to emphasize the relevance of the qualitative approach in research due to the frequent uses, having the knowledge that the spectrum of qualitative research techniques is wide due to its high capacity to add knowledge and meanings to the phenomena studied. The established debate encourages researchers, particularly those in the area of Mathematics Education, to face the challenges established by the new educational conditions experienced in contemporary society.

Keywords: Qualitative approach in research; Teacher training; Teacher Professional Development; Lesson Studies Study) ; Mathematics Education.

1 INTRODUCTION

The theoretical contribution that guides this chapter is constituted by the cast of authors whose productions are focused on qualitative research in an intricate subject/object interaction. In this way, we propose to emphasize the relevance of the qualitative approach in research due to its frequent uses, knowing that the spectrum of qualitative research techniques is wide due to its high capacity to add knowledge and meanings to the studied phenomena that allow dimensioning a *corpus* to the investigation questions.

Our understanding is that studies on teacher education can contribute to the unveiling of certain phenomena or objects of investigation that, based on a qualitative perspective, allow us to apprehend and understand the desires and expectations of teachers.

The current experiences of teachers, training spaces, learning communities and varied field experiences mobilize general questions that permeate our thoughts and lead our writings supported by an extensive knowledge base that aims to promote the understanding of the formation (initial and continuous) of teachers.

It is worth mentioning that qualitative research has become important in Mathematics Education in several lines of research such as: Teacher Training; History of Mathematics; History of Science and Mathematics Teaching; Psychology of Mathematics Education; Didactics of Mathematics, among others.

Thus, in this chapter, we present, as a product of our investigation, a bibliographic and documentary review of qualitative research in the Human Sciences with the objective of listing some reflections of scholars on the panorama of the development of academic investigations that use the qualitative perspective in the field of Mathematics Education.

Therefore, we emphasize that our investigation is based on the following assumptions: research, as an educational and scientific principle, must permeate the training and pedagogical practice of teachers who work in basic and higher education; the exploratory and subjective character crosses qualitative research and teacher training takes place throughout life. Therefore, theoretical studies must reach teachers' knowledge in order to support their practices in the classroom.

This chapter is structured as follows: at first, we seek to present our motivation for the present study and the historical and philosophical foundations of the qualitative approach to research in Education that underpin the modalities of qualitative research developed, especially in the region of inquiry of Mathematics Education.

In the following sections, we list some research related to the training (initial and continuing) of teachers that unfolds for an understanding of Teacher Professional Development that can support the current debate around the pedagogical practice in Mathematics. Finally, we bring a reflection on *Lesson Study* (class studies) which, centered on the pillars of professional development and student protagonism, promotes the learning of mathematics among students with the perspective of learning mathematics teaching among teachers.

2 QUALITATIVE RESEARCH APPROACH IN SCHOOL CONTEXTS

The qualitative approach to research in education has been and has been the subject of multiple interpretations arising from different conceptions and possibilities of studying the phenomena that involve human beings and the intricate social relationships that are established in different environments.

The historical origin of this approach based on the question whether the method of investigation of the physical and natural sciences should continue to be the model for studying human and social phenomena, together with the foundations of a positivist approach to knowledge, began to drive researchers in favor of a hermeneutic approach concerned with the interpretation of meanings contained in everyday life and their interrelationships.

From this perspective, the focus of investigation centered on understanding the meanings attributed by subjects to their actions within a context and on principles that the qualitative approach to research in education advocates, we assume as a presupposition of this study that human experience is mediated by interpretation .

Very close to symbolic interactionism, which constitutes a theoretical perspective for understanding the way in which social actors interpret the objects and other people with whom they interact and how such a process of interpretation leads individual behavior in specific situations, was developed, in Anthropology, a trend known as ethnography whose central concern is focused on the meanings that actions and events have for the people or groups studied.

Ethnographic research places emphasis on the process, on what is taking place rather than on the product or end results. The ethnographer tries to capture and portray the personal vision of the participants and has the task of gradually seeking to approach the ways of understanding the reality of the studied group, sharing with them the meanings elaborated.

Although these conceptions permeated the debates at the end of the 19th century , studies based on this qualitative methodology were sparse until the mid -20th century , and in the area of education it was only in the 1960s that they began to appear. According to Bogdan & Biklen (1994), the delay in research with this approach is due to the strong experimentalist tendency dominated by Psychology. In the following decade (in the 1970s), studies and research with a qualitative approach flourished mainly in the United States and England.

In the 1980s , this approach became popular in Brazilian research in the field of education in the search for translating and expressing the meanings of social phenomena. Nowadays, qualitative research has been used in association with various interpretive techniques that study phenomena related to human beings and their intricate social relationships with the intention of describing and decoding the components of a complex system of meanings that promote the reduction of the distance between theory. and practice.

According to Bogdan & Biklen (1994, p. 67), in qualitative research, “the main objective of the researcher is to build knowledge and not give an opinion about a given context”. As the authors argue , the expression “qualitative research” is a generic term used to refer to a set of research strategies that have common characteristics such as the ability to “generate theory, description or understanding” (BOGDAN & BIKLEN, 1994, p. 67) that is, it seeks to understand the process through which the interviewed participants construct meanings on the topic to be investigated.

Gatti and André (2011) highlight four important points of qualitative research that characterize a “new connotation”:

- i) A deeper understanding of the processes that produce school failure, one of the major problems in Brazilian Education, which is now being studied from different angles and with multiple approaches;
- ii) Understanding of educational issues linked to social and socio-cognitive prejudices of different natures;
- iii) Discussion on diversity and equity; and
- iv) Emphasis on the importance of school and community environments. (GATTI & ANDRÉ, 2011, p. 34).

It should be noted that the option for a qualitative methodological approach in the field of research in Mathematics Education is justified by the fact that this tendency

[...] answers to very particular questions. [...] works with a universe of meanings, motives, aspirations, beliefs, values and attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reduced to the operationalization of variables (MINAYO, 1996, pp. 21-22).

In light of the foregoing, it can be said that the movement of reviewing historical moments of qualitative research in the context of Brazilian education helps to reveal the construction of knowledge in the dynamics of understanding humanization processes in school institutions.

In this perspective, Bogdan & Biklen (1994, p. 47-50) present five characteristics of qualitative research, presented here in a schematic way: 1) the direct source of data collection is the natural environment where the phenomena occur, constituting the researcher the main instrument. “Qualitative researchers attend study sites because they care about context.” (BOGDAN & BIKLEN, 1994, p. 48). The authors argue that actions are better understood when they are observed in the very environment in which they occur. 2) Qualitative research is descriptive because “the data collected are in the form of words or images and not numbers” (BOGDAN & BIKLEN, 1994, p. 48). This data includes interview transcripts, field notes, photographs, videos, personal documents, memos or other records. (BOGDAN & BIKLEN, 1994, p. 48). 3) Qualitative researchers are more interested in the process than simply the results or products. (BOGDAN & BIKLEN, 1994, p. 49). The researcher's interest is to verify how a problem manifests itself in some situations. 4) Qualitative researchers tend to analyze data (rather than assumptions) inductively. “They do not collect data or evidence with the aim of confirming and informing previously constructed hypotheses, instead, abstractions are constructed as the particular data that were collected come together” (BOGDAN & BIKLEN, 1994, p. 50). 5) Meaning is vitally important in the qualitative approach. “Researchers using this approach are interested in how different people make sense of their lives.” (BOGDAN & BIKLEN, 1994, p. 50).

In this chapter, we consider relevant the potential of the mentioned approach both in investigations on initial and continuing education of teachers in which the problematization of the practice itself is configured as one of the constitutive elements of a conscious teaching action.

the qualitative approach, Bogdan & Biklen (1994) argue, based on Psathas (1973, p. 51) that the role of the researcher in this approach is to question the research subjects in order to perceive “what they experience, the ways in which they interpret their experiences and the way in which they themselves structure the social world in which they live”. (PSATHAS, 1973 *apud* BOGDAN & BIKLEN, 1994, p. 51, emphasis added).

The investigations and actions based on a qualitative perspective can bring contributions both to the training and to the teaching practice, especially when the teacher problematizes and investigates his/her practical proposal. In the field of didactics, this process was discussed by Martins (2002; 2003).

In this scenario, studies on the daily life of the school seem to play an important role. Such studies can be related both to the possibility of reflection on the teacher's own practice, and to research with a qualitative approach aimed at understanding aspects of the school's daily life.

André (2002), when discussing ethnographic studies in the educational field, argues that the dimension of the institutional climate acts in the mediation between social praxis and what happens at school. It should be noted that one of the burning issues in teacher education is the articulation between theory and practice. According to the aforementioned author:

School praxis is determined by broader social praxis through pressures and forces arising from educational policy, from top-down curricular guidelines, from parents' demands, which interfere with school dynamics and confront the entire social movement of the inside the institution. The school results, therefore, from this clash of various social forces. (ANDRÉ, 2002, p. 40).

The author also mentions two other dimensions: the interaction in the classroom, which involves the teacher and students relationship, but is influenced by the school dynamics and the social dimension, and also the history of each subject that manifests itself daily at school through the forms of social representation through which it guides its actions. In this process, the author highlights the dimension of the individual's subjectivity. These three dimensions, according to André (2002), make it possible to understand the social relationships expressed in everyday school life, in a dialectical man-society approach in the different moments of this relationship.

As has been discussed, qualitative research is focused on phenomena - what is shown, what is manifested - and not on facts characterized by events, occurrences and objective realities.

The advances that have taken place in the scientific production of qualitative research are configured in different ways both in terms of theoretical foundations and in methodological references about the applicability of technical procedures to investigate the object in the various academic areas in Education, revealing qualitative methods and links established with subjects and investigated problems.

In qualitative research, methodological rigor is not synonymous with neutrality, even if it preserves a thorough congruence with the theoretical contributions and technical procedures of scientific investigation. The concept of methodological rigor alerts us to André (2013, p. 96): "it is not measured by the naming of the type of research, but by the clear and detailed description of the path followed by the researcher to achieve the objectives and by the justification of the options made in this path".

In the scenario of the qualitative approach, the methodological rigor of the research is established by the explanation of the steps followed in carrying it out, that is, the clear and detailed description of the path taken to achieve the objectives, with the justification of each option made in this path. This explanation, in addition to revealing the concern with the scientific rigor of the work (whether or not the necessary

precautions were taken in the choice of subjects, in the procedures of data collection and analysis, in the elaboration and validation of the instruments and in the treatment of the data), it also reveals the ethics of the researcher, who, when exposing their points of view, gives the reader the opportunity to judge their attitudes and values.

Lüdke and André (2013) guide that the choice of methodology is determined by the nature of the problem. Thus, for the complex reality that characterizes the school to be studied with scientific rigor, subsidies must be sought in the qualitative approach of research, since this type of investigation and its ability to understand school-related phenomena offers essential tools for interpretation. of educational issues.

According to Minayo (1996, p. 239):

Neither [approaches], however, is good in the sense of being enough to fully understand this reality. A good method will always be the one that allows a correct construction of the data, help to reflect on the dynamics of the theory. Therefore, in addition to appropriate to the object of investigation and to offer theoretical elements for analysis, the method has to be operationally feasible.

It is up to the researcher, therefore, the continuous effort to overcome this controversy and rescue a dialectical vision between these two traditions of social research.

The following section is intended to explain qualitative investigations aimed at teacher training and the professional development of teachers, relevant topics among those considered essential in issues related to the school context.

3 LINKS ESTABLISHED BETWEEN TEACHER TRAINING AND TEACHER PROFESSIONAL DEVELOPMENT

The educational action necessarily becomes a social praxis and, in this sense, it is necessary to understand the constitutive nexuses of this reality and, for these reasons, the qualitative approach research stands out with its subjective character in relation to the object of analysis.

Teacher training has become a strategic element. However, it is necessary to problematize the different conceptions of training, especially that of continuing education, because, as Souza (2006) recalls, the argument of teacher incompetence ends up supporting reductionist conceptions and practices of continuing education.

The aforementioned author brings some reflections about the ethnographic approach in education based on the studies of Patto (2015) who carried out a comprehensive literature review to problematize the issue of teacher training.

Souza (2006), based on an analysis of the literature and the reality of São Paulo, identifies the improvement of the quality of education as the founding argument of the propositions about continuing education. The author problematizes the unfolding of the work of Guiomar Namó de Mello published in the 1980s based on two categories: technical competence and political commitment. According to Souza

(2006), Mello, even if unintentionally, contributed to the construction of a negative view of teachers, resulting in a simplistic view based on teacher incompetence, being part of a "hegemonic academic discourse and educational policies " (SOUZA, 2006, p. 484).

According to the author:

[...] our analyzes indicate that recent proposals for continuing education for educators, developed by SE, have taken teachers individually and isolated from their work context, considering poorly qualified professionals who need to be better trained. Schools, their social and institutional contexts, as well as the concrete teaching conditions that each specific school offers, have not been considered as important elements that provide the fabric for the process of change that teachers are expected to go through. (SOUZA, 2006, p. 488)

It is true that ethnographic studies that seek to apprehend and understand the daily life of the school are important, mainly to subsidize the construction of public policies based on real demands, whether focused on training or teaching work. Since, based on the inseparability of training and teaching work, continuous training strategies added to the improvement of working conditions can contribute to a teaching practice towards a critical and reflective performance, enabling an improvement in the social qualification of work and teacher training , valuing the work of the teacher and also improving the social quality of the education of the student.

In this way, investigating the professional development of teachers goes far beyond the analysis of the knowledge they acquire throughout their professional teaching life. It implies considering them autonomous subjects and protagonists with desires, intentions, utopias, etc., who suffer the conditioning of the historical, cultural, political and social contexts in which they are inserted (GONZÁLEZ PÉREZ, 2015). Therefore, it is a topic that, in order to be researched, brings human relations and the questioning of the world, which involves school practices and institutional knowledge, requires questioning public policies and relating them to the time in force, with the people involved and with the researcher. That is, a matter of relationship with the world, with school practices, with institutional knowledge, with public policies, with our time, with others and with oneself.

It is also necessary to take into account the practical experiences, built over the years of work in teaching, as it is also an important factor to consider because it means recognizing teachers as producers of knowledge, as they are often excluded from this process of reflection on the practice itself.

The professional development of teachers, according to Imbernón (2011), refers to several areas in which their actions are manifested, the projects they wish to undertake and the way they plan to execute. Still, as the scholar defends, this development seeks to promote changes in the work actions of teachers, leading to professional and personal growth.

The sociocultural context strongly influences the professional development of the teacher as it is an individual and collective process that takes place in the educational institution, although it is not solely due to pedagogical development, but also involves knowledge and understanding of oneself, cognitive

development, theoretical development and everything that encompasses a work situation that allows or prevents the teacher from progressing in his professional life (IMBERNÓN, 2011, p. 3).

For Marcelo Garcia (2009), investing in a teaching career contributes to the growth of teachers as professionals and in their individuality, by providing an improvement in the teaching and learning process that reverberates in the improvement of educational quality.

Finally, it is important to point out that continuing education, from a perspective of professional teacher development, requires time, experimentation and maturation, aspects that are not consistent with school proposals that are decontextualized from the current reality.

Having presented some discussions about the qualitative approach in research in Human and Social Sciences, in the next section, we will make some reflections about this approach in the field of Mathematics Education.

4 TEACHING LEARNING: THE CONTRIBUTIONS OF THE THEORY AND PRACTICE BINOMIAL

In this topic we present our reflections on teaching learning, that is, how the subjects learned to be teachers and understanding that teaching is surrounded by different feelings at different moments of professionalization, from the beginning of fears and groping to a period of stabilization. marked by the desire to learn and the desire to get it right in relation to the path to be followed in the exercise of consolidating the teaching career. Mizukami (2004, 2006) and Shulman (2014) highlight the importance of teaching pedagogical knowledge that must be mobilized in the way of teaching learning.

Teacher training must be related to the practice of the teaching professional, a systematic and scientific activity, which, in a movement of constant dialogue, aims, therefore, to qualify and improve the professional development of the teacher.

We understand that teaching learning should promote moments of reflection for an awareness of pedagogical praxis *vis a vis* a reflective educational planning in which teacher training is considered the basis of research in the educational field. The pedagogical praxis that we defend involves the “understanding of the inseparability of theory and practice”. (PIMENTA, 2011, p. 86) Thus, according to the author, “praxis is the practical human theoretical attitude of transforming nature and society”. (PIMENTA, 2011, p. 86), that is, a continuous and simultaneous process between thinking and acting. Therefore, practice and theory are dependent and correspond to a unity of knowledge, as the teacher is committed to mediating reflective and constructive learning in educational formative moments.

Lee Shulman proposed in the mid-1980s a base composed of categories of teaching knowledge of different natures, but all of which are indispensable and necessary for competent professional performance. According to SHULMAN (1986, 1987), the knowledge base refers to a professional repertoire that contains categories of knowledge that underlie teachers' understanding that promote student learning. In his

investigations dating from 1996, he proposed to study teaching cases as promising tools in teacher training processes in the face of their teaching learning, using them “as lenses to think about their own work in the future”. (SHULMAN, 1996, p. 199)

Case knowledge is knowledge of specific, well-documented, and richly described events. Regardless of whether cases are reports of events or sequences of events, the knowledge they represent is what makes them cases. Cases can be examples of specific instances of practice – detailed descriptions of how an instructional event took place – complete with particular contexts, thoughts and feelings. On the other hand, they can be examples of principles, exemplifying in their details a more abstract proposition or a theoretical requirement. (SHULMAN, 1986, p. 11)

Finally, teaching cases play an important role when they are used to exchange, organize and generalize experiences, whether through discourse or professional memory.

4 TEACHER PROFESSIONAL DEVELOPMENT AS A TREND IN MATHEMATICS EDUCATION

According to Ponte (1998), the concept of Teacher Professional Development emerged in the educational literature to demarcate a differentiation with the traditional, and not continuous, process of teacher training. The idea of training is related to courses and training in which the trainer carries out an action that is assumed to be necessary and expected by the institutions for the performance of professionals.

Professional development refers to the transformation movement of teachers within a specific professional field, in this case, that of Mathematics. From this perspective, a process of becoming over time or from a formative action. André (2011), when considering studies on teacher training, cites Nóvoa (2009), Imbernón (2011) and Marcelo Garcia (2009) as authors who prefer the term development to characterize evolution and continuity, breaking with the dichotomous view of initial training. and continued.

One of the aspects that stimulate the professional development of teachers is the search for a professional identity that allows teachers to define themselves and others (MARCELO GARCIA, 2009). Identity is the feeling of belonging that portrays the image of the teacher. Professional identity is characterized by the importance that teachers give to their image in the face of the profession. In this sense, the interpretation that teachers have of themselves in the context in which they live in the search for a sense of identity and belonging throughout their teaching career is relevant.

Professional development is built from entering school, as a student, and lasts a lifetime, with groping and advances. In addition to being a continuous process that extends throughout the working life, from initial training to postgraduate studies, it undergoes permanent updates and improvements in service.

The analysis of professional development is one of the methodological assumptions of a qualitative investigation that, in the conception of Lüdke and André (2013, p. 13) “implies the collection of descriptive data, obtained by the researcher's direct contact with the situation studied, emphasizes more the process rather than the product and is concerned with portraying the perspective of the participants”.

The professional training of educators, particularly mathematicians, and the way they act is intrinsically related to professional development, which is composed of knowledge, considered fundamental, but not sufficient, as it is necessary to know how to do it and to know how to manifest it in the form of knowledge or skills. professionals.

The problematized and shared practice of the mathematics teacher acquires connotations of professional development when it is configured by the partnership between university and school. Therefore, professional development needs new work systems and new learning in favor of better qualification and teaching autonomy that is only acquired through a personal, social and political construction that takes place through the interaction of different actors in the school system in a democratic process. It also depends on an educational management that is the result of a collective process of planning, organization and development of a political-pedagogical project that expresses a new paradigm for education.

In the last topic of this chapter, we bring the studies by Ponte et al (2016) that pointed out a relevant contribution to the training of Mathematics teachers by unraveling the challenges that are posed to the practice of research to understand the potential of the methodology of studies of mathematics. lesson (Lesson Study) as a professional development process for teachers, which focuses on their teaching practice, assuming an eminently reflexive and collaborative.

5 LESSON STUDY AND MATHEMATICS TEACHING

“Classroom studies take place within the school environment and in them teachers play a central role” (PONTE et al., 2016, p. 869).

Preparing teachers to teach Mathematics is not an easy task and the experiences of countries that use the *Lesson concept Study* (class studies) in everyday school life is important so that we can even understand this proposal.

The *Lesson Study* is a process in which teachers come together to plan, observe and reflect together on the technique used in the classroom and the lesson plans they have developed in order to improve student performance. The *Lesson Study* is centered on two pillars: professional development and student protagonism. Therefore, it is an interesting perspective because not only students, teachers also learn.

It is a strategy that engages students so that they are active in their learning and are aware that the process of acquiring knowledge is collaborative, as it is also an opportunity for teachers to learn when they study the teaching process.

Another relevant aspect of *Lesson Study* is the opportunity to discuss ways of professional development, from how to work as a team to learn to teach Mathematics. The *Lesson Study* originated in Japan and is understood as a training process in which teachers learn in practice and have the opportunity to reflect, analyze, discuss and plan their classes, focusing on student learning. The main characteristics are

reflection and collaboration, processes that lead teachers to analyze their practices, through work among peers.

In this topic, we bring a discussion about *Lesson Study* in Mathematics Teaching with the assumption that it is a methodological proposal that can be adapted to the Brazilian reality, based on experiences carried out in other countries.

The training of teachers who teach Mathematics using the *Lesson methodology study* it is enhanced by elements that we consider essential, such as: i) the constitution and consolidation of collaborative groups; ii) research into the practice itself; iii) individual and collective reflection of didactic actions; and iv) the appropriation and use of curricular guidelines.

A fundamental aspect of classroom studies is that they focus on student learning and not on the work of teachers, which makes a direct distinction with other training processes. involving observation of classes, but which are primarily focused on the performance of teachers. In this way, the participation of teachers in class studies conducive to collaborative environments promotes learning “of important issues in relation to the content they teach, the curricular guidelines, the reasoning processes and the difficulties of the students and the classroom dynamics” (PONTE et al, 2016, p. 870).

Therefore, class studies consolidate training processes strongly linked to teaching practice, enabling theoretical deepening in several domains - mathematics, didactics, curricular, educational and organizational.

5 BY WAY OF CONCLUSION

From this bibliographic study based on different sources that address reflections on methodological issues of qualitative research, it is shown that Brazilian educational thought was historically permeated by epistemological and methodological thematic convergences and divergences.

Academic research with a qualitative approach is carried out when the study objective is to understand the reason for certain events, phenomena, behaviors or trends.

The use of the qualitative method generated several contributions to the dynamics and structure of the educational process by reconfiguring the understanding of learning and of internal and external relationships in educational instances, with a flexible qualitative approach without departing from methodological rigor. This demonstrates the existing complexity when researching the social, given that it is necessary to know how to adapt to the context and then extract relevant analyses. For this reason, its foundation is supported by interpretation (hermeneutics) that seeks to understand the meanings of what human beings live, feel, etc.

The reflection carried out throughout this text allowed us to carry out a historical reconstruction of academic research with a qualitative approach to glimpse perspectives of a praxis of conscious investigation through the articulation of teaching knowledge with teaching, research and extension activities.

The debate instituted encourages researchers to face the challenges established by the new educational conditions experienced in contemporary society due to the pandemic of the new Coronavirus. The repercussions in the coming years, post-pandemic, will demand deep questions and responsible actions, with anthropological, philosophical and sanitary references different from the status of the educational tradition.

Presenting the historical characteristics of the qualitative methodology of research in education, its theoretical concepts and main researchers that contribute with reflections in this area can support the establishment of an analytical scientific process of social relations, especially with regard to the role of the math educator.

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