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Abstracts

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Teleconsultations and their implications for health care: A qualitative study on patients' and physicians' perceptions

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Keywords: Digital health; Integrated care research; Primary health care; Referral; Telehealth

Objective: Digitization in everyday medical practice has gained importance along with the drive to expand teleconsultations arising from the COVID-19 pandemic. This study aimed to explore physicians' and patients' perspectives on the adoption of teleconsultations between primary care and the referral cardiology department.

Methods: Participants were recruited for semi-structured interviews between September 2019 and January 2020. The interviews were audio-recorded and pseudonymized. The transcribed interviews were stored, coded, and content analysis was performed in MAXQDA.

Results: A total of 29 participants were interviewed. Patients and physicians merged in their views on 'process' issues, i.e., those concerning a better prioritization of patients and an improved collaborative practice, albeit with possible technological constraints. Physicians recognized that teleconsultations presented an educational opportunity for managing patients' health problems. Our findings suggested that not all patients would require equally intensive collaborative activities across the health system. The barriers described included difficulties using the system (technical issues) and concerns about workload as a consequence of the disruption of traditional clinical routines. Patients revealed strong support for teleconsultation on the grounds of interprofessional collaboration and avoidance of unnecessary hospital visits.

Conclusions: Patients, caregivers and physicians contribute with different perceptions about teleconsultations that may lead to organizational changes in the provision of services. The implementation of teleconsultations between levels of care may be facilitated when the participants see the added value of this service, that adequate resources are put in place and that there is flexible implementation. This work added an in-depth understanding of participants' perceptions of this intervention in a case study.

Effects of physical activity in people with hip and knee osteoarthritis: 10-year follow-up of a population-based cohort

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Keywords: Osteoarthritis, quality of life, physical fitness, exercise, longitudinal study

Objective: Hip and knee osteoarthritis (HKOA) is a chronic disease characterized by joint pain that leads to reduced physical function and health-related quality of life (HRQoL). At present, no cure is available. Clinical trials indicate that people with HKOA benefit from physical activity in several health-related outcomes. However, few studies have evaluated the long-term positive effect of regular physical activity. This study analyzed participants with HKOA from a nationwide population-based cohort (EpiDoC Cohort) to assess the impact of physical activity on patients' physical function and HRQoL over 10 years.

Methods: The regular weekly frequency of intentional physical activity was self-reported as non-frequent (0 times/week), frequent (1–2 times/week) or very frequent (≥3 times/week). This study followed 1086 participants over a mean period of 4.7 ± 3.4 years, during which 6.3% and 14.9% of participants reported frequent and very frequent physical activity, respectively.

Results: Using linear mixed models, we found that frequent ($\beta = -0.101$ [-0.187, -0.016]; $\beta = 0.039$ [-0.002, 0.080]) and very frequent physical activity ($\beta = -0.061$ [-0.118, -0.004]; $\beta = 0.057$ [0.029, 0.084]) were associated with improved physical function and HRQoL over time, respectively, when compared with non-frequent exercise, adjusting for years to baseline, sex, age, years of education, body mass index, multimorbidity, hospitalizations, clinical severity and unmanageable pain levels.

Conclusions: These findings raise awareness of the importance of maintaining exercise/physical activity long term to optimize HRQoL and physical function. Further studies must address barriers and facilitators to improve the adoption of regular physical activity among citizens with HKOA.

Actual and perceived motor competence and cardiorespiratory fitness: differences between normal-weight and overweight/obese children

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Keywords: Body composition; child development; motor skills; perception; physical fitness

Objective: The aims of this study were to analyze whether school-age children with normal-weight and overweight/obesity (OW/OB) differ in terms of cardiorespiratory fitness, actual and perceived motor competence.

Methods: Cross-sectional data were obtained from a total of 280 Portuguese children (48.2% girls; mean age 8.62 yrs; SD 1.15). Children were assessed on the accuracy of four motor tasks for perceived motor competence (PMC), motor competence (MC) (with the Motor Competence Assessment (MCA) instrument), cardiorespiratory fitness (CRF) (with the 20-m shuttle-run test), height and weight. World Health Organization growth standards were used to calculate Body Mass Index (Kg/m^2) percentiles and classify children as having OW/OB or normal weight.

Results: Almost 30% of children had either overweight (11.8%) or obesity (16.1%). Children with OW/OB presented significantly worse results than their normal-weight peers, regarding MC (t=2.77, p=.006), PMC ($F(1)$=3.98, p=.047) and CRF ($F(1)$=36.96, p<.001).

Conclusions: This study indicates that OW/OB in children is associated with poorer cardiorespiratory condition, less PMC accuracy and lower level of motor competence. Given that actual and perceived MC are motivational factors that influence children's involvement in motor and physical activities, it is encouraged that both school and health settings provide opportunities to further develop MC, PMC accuracy, increase CRF and healthy body weight status, implementing holistic interventions that target the promotion of these aspects.

Minimal intervention of patient education is not that minimal for low back pain management: a systematic review with meta-analysis

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Keywords: Disability; Narrative synthesis; Pain; Quantitative synthesis; Single session

Objective: To explore if the effects of minimal intervention consisting of a single session of patient education (MIPE) for low back pain (LBP) are superior and non-inferior, respectively, when compared with no or other interventions for reducing disability and pain in patients with LBP.

Methods: An electronic search for randomized controlled trials were conducted in MEDLINE, EMBASE, CENTRAL, CINAHL, and PsychINFO from inception to June 2020. Two reviewers independently screened the references and extracted outcome data which were standardized to a 0-100 scale, using random effects meta-analysis to calculate summary effect estimates. A non-inferiority margin of 5 points was considered for the non-inferiority hypothesis. Revised Cochrane risk-of-bias tool and GRADE guided the risk of bias and certainty of evidence assessment, respectively.

Results: A total of 18 trials were included. Narrative synthesis found no differences between MIPE and no intervention for both disability and pain. Compared with more extensive interventions, evidence of low certainty found that MIPE was inferior for both short-term disability (mean difference= 4.10 [95%CI 1.16, 7.04], 13 studies, n= 2 931, I^2= 77%) and pain (mean difference= 11.93 [95%CI 2.75, 21.11], 8 studies, n= 1 259, I^2= 92%). No differences were found for subsequent timepoints. The non-inferiority hypothesis was confirmed only for long-term disability (mean difference= 1.06 [95%CI -1.61, 3.74], 7 studies, n= 2 140, I^2= 66%, low certainty).

Conclusions: MIPE may provide slightly inferior benefits on short-term disability and pain compared with other interventions. Beyond this timepoint, no important differences were found which suggests that MIPE has a role to play in LBP management.

Violence, directly and indirectly, compromise older adults` independence: A hidden reality

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Keywords: Elder abuse, Elderly, Cognitive performance, Physical fitness

Objective: To determine the relationship between older adults` exposure to violence and their independence on activities of daily living (ADL) performance, considering their physical and cognitive fitness.

Methods: Participants were 456 community-dwelling older adults (73.5±6.4 years). Exposure to violence was assessed by the Risk Assessment of Violence against the Non- Institutionalized Elderly Scale (ARVINI) and Independence by the Composite Physical Function. Cognitive and physical fitness was assessed by the Mini-Mental State Examination and Senior Fitness Test, respectively. Physical (in)activity was assessed by the International Physical Activity Questionnaire.

Results: Multivariate linear regression analysis selected ARVINI score (β: -0.129; 95%CI: -0.235 – -0.022), sex ($β_{male}$: 1.570, 95%CI: 0.818 – 2.321), cognitive state (β: 0.133; 95%CI: 0,049 – 0.216), agility and balance (β:-0.681; 95%CI: -0.857 – -0.505), aerobic endurance (β: 0.008; 95%CI: 0.004 – 0.013), lower flexibility (β: 0.015; 95%CI: 0.008 – 0.066), and physical activity metabolic expenditure (β: 0.000109; 95%CI: 0.000006 – 0.000211) to include in the model explaining independence (R^2: 0.482); in which a higher ARVINI score was associated with a lower independence, (p<0.05). In its turn, an increased ARVINI score explained a lower cognitive state (R^2:0.015), agility and balance (R^2: 0.023), and aerobic endurance (R^2: 0.013), (p<0.05).

Conclusions: Exposure to violence showed to compromise community-dwelling older adults` independence, regardless of sex, cognitive state, and physical fitness and activity. Besides its direct effect on independence, exposure to violence showed to explain a lower cognitive and physical fitness, which in turn are associated with lower independence. These results help to illustrate the hidden consequences of violence against older adults.

Towards developing a Core Outcome Set for malnutrition intervention studies in older adults: scoping review and next steps

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Keywords: Core Outcome Set; Delphi; Malnutrition; Randomized Controlled Trials; Review

Objectives: We aimed to develop a Core Outcome Set (COS) for future nutritional intervention studies in older adults with and at risk of malnutrition.

Methods: The project consists of five phases: Phase 1: Scoping review where four electronic databases (Medline, EMBASE, CINAHL and Cochrane Central Register of Controlled Trials (CENTRAL) were systematically searched to identify frequently used outcomes in published RCTs. This was followed by patient interviews to add additional patient-reported outcomes; Phase 2: The resulting outcomes were incorporated in a modified Delphi survey and sent to experts to rate; Phase 3: A consensus meeting to discuss and agree what critical outcomes need to be included in the COS; Phase 4: Instead of which outcomes, in this phase it will be determined how each COS outcome should be measured based on a systematic review, the Delphi survey and a second consensus meeting; and Phase 5: Results will be disseminated and implemented.

Results: Sixty-three articles reporting 60 RCTs were identified in the scoping review. Most frequently used outcomes included body weight/body mass index (75% of RCTs), dietary intake (62%), functional limitations (48%), handgrip strength (47%), and body circumference (40%). Frequencies differed by setting (community, hospital and long-term care).

Conclusions: This project will result in a COS to be included in future RCTs evaluating nutritional interventions in older adults with and at risk of malnutrition. Facilitating comparison of RCT results, optimising research resources, and reducing information and publication bias will, ultimately, support clinical decision-making for treating and preventing malnutrition in older adults.

Exploring Barriers and Facilitators to the Implementation of the MyBack Programme in Primary Care: A Qualitative Study

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Keywords: Behaviour change, exercise, implementation science, low back pain, qualitative research

Objective: MyBack is a tailored exercise and behaviour change programme to prevent low back pain recurrences. The aim of this study was to explore barriers and facilitators to the implementation of the MyBack programme and to the adoption of regular exercise practice, from the physiotherapists' and patients' perspectives, respectively.

Methods: For data collection, 4 focus groups (2 with physiotherapists; 2 with patients) were conducted. The focus groups were based on a semi-structured interview schedule informed by the Capability, Opportunity, Motivation-Behaviour (COM-B) model and the Theoretical Domains Framework (TDF). All focus groups were held through videoconference, were audio and video recorded and transcribed verbatim. A deductive content analysis, using a coding matrix based on the TDF and COM-B, was independently performed by two researchers. A third researcher was approached to settle disagreements.

Results: In total, 14 physiotherapists and 11 patients participated in the focus groups. Following the content analysis in the physiotherapists' focus groups, thirteen barriers (7/14 TDF domains; 4 COM-B components) and twenty-three facilitators (13/14 TDF domains; 5 COM-B components) for the MyBack implementation were identified. Regarding the patients' focus groups, thirteen barriers (8/14 TDF domains; 4 COM-B components) and sixteen facilitators (12/14 TDF domains; 5 COM-B components) to the target behaviour of regular exercise practice were found.

Conclusions: This study has provided detailed information about the potential barriers and facilitators to the implementation of the MyBack programme and the adoption of regular exercise practice. The acquired knowledge will be used to inform and optimize its implementation strategy.

An indicator to measure access to medicines – the Portuguese Index of Access to Hospital Medicines 2021

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Keywords: Access; hospital; indicator, medicines, Portugal

Objective: The main objective of this project was to build an indicator to measure access to medicines and to study the level of access to hospital medicines.

Methods: A cross-sectional study was performed in Portuguese NHS Hospitals. An expert panel of 7 members was previously consulted using a consensus methodology to define the dimensions that should integrate the index of access and the weighting that every dimension should assume. Six dimensions were identified to integrate the formula of the indicator: Access to innovative medicines; Proximity distribution; Shortages; Access to medicines prior to decision of financing; Value-based health care and Access to medication depending on cost/financing. Data collection was performed through an electronic questionnaire sent to all NHS hospitals in mainland Portugal (September 2021).

Results: Response rate was 61.2%. Regarding the dimensions that integrated the index, the results were the following:

Most Hospitals used innovative prior to official funding decision, thus ensuring overall access to therapeutic innovation; the majority of the respondent had a proximity distribution program (87%), most of them initiated during the pandemic period.

The majority of the Hospitals report a relevant impact of shortages of medicines. Monitoring and generating evidence for results of new therapies is insufficient: only 53% of the institutions perform this type of analysis. The price/financing model was only identified by 10% as a barrier to access to medicines.

The 2021 Portuguese *Index For Access to Hospital Medicines* was 66%. Shortages and value-based use of medicines were the dimensions that had more influence in lowering the index value.

Conclusions: The Portuguese Index of Access seems to be a useful indicator, sensitive and objective, based in several and diverse dimensions. The new indicator will be used to monitor access to hospital medicines in Portugal at regular intervals of time (annual or biannual).

3rd CHRC Annual Summit

Variation in cesarean section and hip surgery within 48 hours after admission in Portuguese public hospitals

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Keywords: Health policy; Healthcare variations; Practice variation; Regional health planning; Unwarranted variation

Objective: Healthcare practice variation should be as low as possible for the healthcare system to be more efficient. This study investigates the magnitude of Portugal's geographic variation in the percentage of Cesarean Section (CS) and hip surgery within 48 hours after admission. These procedures were selected as Portugal reports approximately double the rate of CS than what is recommended by the World Health Organization, and hip surgery studies report better health outcomes when they are made within 48 hours after admission.

Methods: We retrieved the percentage of CS and hip surgeries within 48 hours after admission from the Portuguese National Health Service (NHS) Transparency Portal database from 2013 to 2020. Using the collected data, we conducted an ecological design study. Rates were compared across districts and reported as percentages. The analysis considered the site of care. Finally, folder differences were calculated by dividing the higher rate by the lower one.

Results: In Portugal, the average CS rate was 29.21% between 2013 and 2020. Norte region registered the highest rate (31.13%) and the Algarve the lowest one (26.66%). Focusing on the hip surgery 48 hours after admission, Centro reported a higher percentage of hip surgeries within 48 hours (56.06%), and the Algarve registered the lowest (18.93%).

Conclusions: Variation was observed for CS and hip surgeries within 48 hours after admission. Analysis of variation will help identify geographic areas to investigate further the issues and challenges to reducing variation.

Trajectories of physical function and quality of life in people with osteoarthritis: Results from a 10-year population-based cohort

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Keywords: Osteoarthritis, Trajectories, Health-Related Quality of Life, Physical Function, Prognosis

Objective: To identify long-term trajectories of physical function and health-related quality of life (HRQoL) among people with hip and/or knee osteoarthritis (HKOA) and analyse the sociodemographic, lifestyle, and clinical factors associated with different trajectories.

Methods: Participants with HKOA from the EpiDoC study, a 10-year follow-up (2011–2021) population-based cohort, were considered. Sociodemographic, lifestyle, and clinical variables were collected at baseline, in a structured interview and clinical appointment. Physical function and HRQoL were evaluated with the Health Assessment Questionnaire (HAQ) and EuroQoL, respectively, at baseline and the three follow-ups. Group-based trajectory modeling identified physical function and HRQoL trajectories. Associations between baseline variables and trajectory assignment was analysed with multinomial logistic regression models (95%CI, p<0.05).

Results: We included 983 participants with HKOA. We identified three trajectories for each outcome: "consistently low disability" (32.0%), "slightly worsening moderate disability" (47.0%), and "consistently high disability" (21.0%) for physical function; "consistently high HRQoL" (18.3%), "consistently moderate HRQoL" (48.4%) and "consistently low HRQoL" (33.4%) for HRQoL. Age ≥75 years, female sex, multimorbidity, and high baseline clinical severity were associated with higher risk of assignment to low physical function and HRQoL stable trajectories. High education level and regular exercise was protective of assignment to low physical function and HRQoL stable trajectories. Unmanageable pain levels increased the risk of assignment to the "consistently moderate HRQoL" trajectory.

Conclusion: The levels of physical function and HRQoL remained stable over 10-years and highlight the importance of tailored interventions that target individuals' modifiable risk factors associated with low physical function and HRQoL trajectories.

Prevalence and factors associated with unmanageable pain levels in people with Osteoarthritis: a cross-sectional population-based study

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Keywords: Osteoarthritis; prevalence; pain management; pharmacological therapies; non-pharmacological therapies

Objectives: To estimate the prevalence of unmanageable pain levels (UPL) among people with hip and/or knee Osteoarthritis (HKOA), characterize the population and identify factors associated with UPL, and compare therapeutic strategies used by people with UPL versus manageable pain levels (MPL).

Methods: Data were analyzed from the cross-sectional population-based EpiReumaPt study involving a representative sample of Portuguese adults with a validated diagnosis of HKOA (n=1,035). Sociodemographic, lifestyle, and health-related data were collected through a structured interview. Pain intensity was collected during a clinical appointment. UPL was defined as a mean pain intensity in the previous week of ≥5 points on 11-point numeric pain rating scale. Information on use of regular analgesic medication, physiotherapy, and surgery was also collected. Data were analyzed using weighted logistic and linear regression models (p<0.05, 95%CI).

Results: The weighted prevalence of UPL was 68.8%. UPL was associated with female sex (odds ratio (OR)=2.36, p<0.001), overweight (OR=1.84, p=0.035), obesity (OR=2.26, p=0.006), and multimorbidity (OR=2.08, p=0.002). UPL was associated with worse performance in ADL and lower QoL (β=-21.28, p<0.001 and β=−21.19, p<0.001, respectively). People with UPL consumed more NSAIDs (22.0%, p=0.003), opioids (4.8%, p=0.008), paracetamol (2.7%, p=0.033), overall analgesics (7.3%, p=0.013) and have a higher use of physiotherapy (17.5%, p=0.002) than people with MPL.

Conclusion: Two-thirds of people with HKOA in Portugal have poor management of their pain levels and clinical and lifestyle factors are associated with unmanageable pain. Future research and implementation of effective interventions to optimize pain levels is needed.

Physiological responses during two types of training after Acute Myocardial Infarction Patients

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Keywords: Cardiovascular Diseases; Central Nervous System Fatigue; Heart Rate Variability; Prognosis; Thermography

Objective: Cardiovascular diseases (CVD) are the leading cause of death globally. Cardiac rehabilitation (CR) programs benefits are overall consensual; however, during exercise, progressive physiological effects have not yet been studied in cardiac patients. Our study aimed to analyze physiological parameters of thermography, heart rate variability (HRV), blood pressure, central nervous system (CNS) fatigue and cortical arousal in acute myocardial infarction (AMI) patients who belong to the CR program of High-Intensity Interval Training (HIIT) compared to Moderate-Intensity Continuous Training (MICT).

Methods: In this case control study, 2 AMI patients (both male, age 48±1.4) were randomly assigned in a 1:1 allocation ratio to one of two groups: cardiac HIIT and cardiac MICT. The MICT at ≈ 70-75% of peak heart rate (HR) and HIIT at ≈ 85–95% of peak HR, followed by a one-minute recovery interval at 40% peak HR. Outcome measurements included thermography, HRV, blood pressure, CNS fatigue, and cortical arousal.

Results: The autonomic response, AMI patients presented higher sympathetic modulation in both programs, showing the HIIT higher sympathetic modulation than MICT, but in the post evaluation the HRV was equal between HIIT and MICT. The MICT training produced higher subjective fatigue and a decrease in cortical arousal than HIIT. In addition, both groups presented higher temperature in the chest.

Conclusions: The HIIT protocol showed better physiological responses during exercise compared to MICT. The AMI patients presented more than twice CNS fatigue in MICT than in HIIT.

Pharmacogenomic Biomarkers Applied to the Effectiveness and Safety of Pharmacological Therapy in Colorectal Cancer

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Keywords: Anticancer drugs, biomarkers, colorectal cancer, pharmacogenomic, pharmacotherapy

Objective: To optimize the therapeutic approach, exploring the possibility of using pharmacogenomic biomarkers that allow the prediction of the benefit-risk balance of each drug in everyone both in terms of effectiveness and safety.

Methods: A systematic literature review (SLR) was carried out, considering the drugs used in the therapeutic protocols for this disease with marketing authorization in Portugal, as well as the pharmacogenomic biomarkers already identified in the corresponding summaries. The objective was to identify studies available in the international literature that describe and characterize both the biomarkers found in the summary of product characteristics (SmPCs) and the possible candidates.

Results: Of the 13 selected drugs, only 10 contained pharmacogenomic information in their summary of product characteristics. Regarding SLR, the biomarker most often identified was UGT1A1 followed by DPYD. SLR revealed that there are also other relevant biomarkers to be explored, especially in the case of oxaliplatin and irinotecan.

Conclusions: Most of the pharmacogenomic variants studied are not validated or recognized by genetic tests, lacking scientific research that effectively proves their usefulness in clinical practice. Currently, a small number of biomarkers are validated and their use when prescribing drugs for colorectal cancer is scarce. It is necessary to create conditions to implement pharmacogenomics in daily practice, investing not only in research, but also in the training of health professionals for this topic.

A persistent course of low back pain is predicted by disability, depressive symptoms, manual job and female gender

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Keywords: Clinical course; chronic low back pain; long-term; population-based study; prognosis

Objective: To assess the clinical course of chronic low back pain (CLBP) over 5 years in a large population-based study, its cumulative impact on disability and health-related quality of life (HRQoL) and the indicators for persistent CLBP course.

Methods: Active CLBP participants were identified from a representative sample of 10 661 adults randomly recruited from the dwelling population of EpiDoC study. Pain, disability and HRQoL were assessed at three time-points. According to their pain symptoms over time, participants were classified as having a persistent or relapsing pain course. A General Linear Model was used to compare mean differences between and within groups. The relation between baseline variables and persistent CLBP was modulated through logistic regression.

Results: Among the 1 201 adults with active CLBP at baseline, 634 (52.8%) completed the three time-points of data collection and 400 (63.1%) were classified as having a persistent course. Statistically significant interactions were found between the group and time on disability ($F_{[2.126]} = 23.78$, $p < .001$) and HRQoL ($F_{[2.125]} = 82.78$, $p < .001$). In the adjusted model, the persistent course was associated with the disability level (OR [CI95%]= 1.84 [1.4 to 2.4]), presence of depressive symptoms (OR [CI95%]= 1.96 [1.2 to 3.2]), female gender (OR [CI95%]= 1.90 [1.26-2.87]) and having a manual job (OR [CI95%]= 1.46 [1.02 to 2.1]).

Conclusions: In the long-term, CLBP patients have distinct clinical courses. Being female, presenting depressive symptoms, having a manual job and a higher disability at baseline predict a CLBP persistent outcome.

Telemonitoring as an alternative to in-person follow-up for patients under anticoagulation after cardiac surgery

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Keywords: Anticoagulation; cardiac surgery; coagulometer; INR; telemonitoring

Objective: Growing medical indications for chronic anticoagulation has led to an increase of patients under vitamin k antagonists. These patients present a higher risk of complications, namely bleeding or thrombosis, due to poor control. Periodical monitoring is required to reevaluate patients' prescription. The goal is to assess whether a remote patient monitoring service, based on the use of a coagulometer, provides a better control of INR (International Normalized Ratio) values in patients undergoing anticoagulant therapy after cardiac surgery, as compared to in-person monitoring.

Methods: Prospective analysis of 30 patients, selected to be followed-up both through a telemonitoring service and in-person, for a period of six months for each monitoring method.

Results: Preliminary results for 20 patients show a high level of compliance and patient satisfaction during the telemonitoring period, with patients submitting their INR values in the online platform in 21 minutes average. The median of absolute differences between the INR measurements and the INR clinical goal decreased progressively during the telemonitoring period. Concurrently, the TTR (Timing in Therapeutic Range) increased progressively during the same period, from 40% in the first month to 70% by the sixth month. The number of reported events was low but allowed for the rapid assistance of patients when necessary. To date, only 5 patients have completed both monitoring periods, with their TTR being higher during the telemonitoring period.

Conclusions: Increased TTR shows good results from the telemonitoring method, with a high level of satisfaction from patients. Telemonitoring is a feasible method to control INR values in patients under anticoagulation after cardiac surgery, saving time and costs.

Exposure to metals in the e-waste management industry

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Keywords: Occupational Health; Environmental Health; Exposure assessment; e-waste management; chemicals; biomonitoring

Objective: The burden of disease associated with occupational exposure is ~6%. The recent EU circular economy policy, where the recycling of e-waste is included, is expected to increase the waste management/recycling sector. The e-waste stream contains a broad range of chemicals namely metals. Human biomonitoring by measurement of specific biomarkers in body fluids is considered as an effective method of exposure surveillance. The present study, framed in the HBM4EU project, aimed to assess the exposure to metals of the e-waste management workers in Portugal.

Methods: A cross-sectional study was developed in two e-waste management companies in Portugal. Thirty workers, aged 31-62 years, collected spot urine samples in the beginning and in the end of the workweek, pre-shift and end-shift, respectively. A control group of 12 participants, aged 38-56 years, with administrative tasks outside the companies was included. Urine samples were analyzed for the determination of cadmium (Cd), chromium (Cr), lead (Pb) and mercury (Hg). Results are expressed as μg metal/g creatinine.

Results: Results revealed that, with the exception for Cr, all analyzed samples presented levels of Cd, Pb and Hg above the limit of quantification. Median levels in the end-shift samples were 0.21, 0.43 and 12.70 μg/g crea for Cd, Hg and Pb, respectively. Significant differences between exposed group and control group were found only for urinary Pb levels ($p < 0.05$).

Conclusions: This study increased the knowledge and understanding of how work practices translate into exposure. These data contribute for the implementation of risk management measures intending to decrease the burden associated with the exposure to chemicals in this occupational setting.

SARS-CoV-2 seroprevalence high-risk healthcare workers of a Portuguese hospital: A cross-sectional study

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Keywords: SARS-CoV-2; COVID-19; Seroepidemiologic Studies; Health Personnel; Occupational Medicine

Objective: Although healthcare workers (HCW) are highly exposed to SARS-CoV-2, occupational risk differs from one another. Before the vaccine's appearance, SARS-CoV-2 antibodies (SARS-CoV-2-ab) surveillance was an important indicator of COVID-19 spread and the effectiveness of the implemented prevention measures. This study's goals were: 1) characterize SARS-CoV-2-ab prevalence among a hospital HCW sample with increased risk of occupational exposure, in the first semester of COVID-19 pandemic in Portugal; 2) explore if some sociodemographic, occupational, and clinical characteristics might be associated with the presence of SARS-CoV-2-ab.

Methods: We conducted a cross-sectional study in the largest Portuguese hospital, during the first semester of COVID-19 pandemic, before the advent of the vaccine. Elecsys® Anti-SARS-CoV-2 assay qualitative detection was performed, and a questionnaire was filled by HCW who worked, for more than one month, in a SARS-CoV-2 high-risk infection environment or had a previous high-risk unprotected contact with a confirmed COVID-19 patient without developing COVID-19 diagnosed by nasopharyngeal swab RT-PCR for SARS-CoV-2 detection.

Results: We found a 1.94% (n=12) SARS-CoV-2 seroprevalence among 617 HCW. Ten of the positive HCW worked in COVID-19 dedicated wards but binary logistic regression could not find this variable as a significant predictor for seropositivity. 72% of all participants never had symptoms, including 9 HCW that tested positive for SARS-CoV-2-ab and 72% who tested negative.

Conclusions: Divergent to most other studies, we found a lower SARS-CoV-2 seroprevalence among HCW compared to the one found in the national and regional community. Although more potentially exposed, more severe protective measures almost certainly may contributed for this result.

Delay in diagnosing pulmonary tuberculosis: an ecological and individual approach

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Keywords: Healthcare delay; Patient delay; Public Health; Pulmonary tuberculosis; Tuberculosis control

Objective: To identify areas with higher delays in diagnosing pulmonary tuberculosis (PTB) cases, and to characterize delay according to its components (patient and healthcare delay) and associated factors, at ecological and individual level.

Methods: PTB patients notified in the National Tuberculosis Surveillance System (2008–2017) and Statistics Portugal indicators. For the ecological analysis, spatial analysis was used to identify areas of high delay, and logistic generalized additive models were used to identify ecological factors associated with these areas. For the individual level analysis, Cox model was used to characterize patient and healthcare delays and estimate the effect of clinical and sociodemographic variables on these delays.

Results: In the ecological analysis, was possible to identify an area in the South region of the country significantly associated with a greater delay in the diagnosis of PTB. Overall, municipalities with smaller population density, smaller proportion of unemployed, fewer health centers and higher old-age dependency ratio, proportion of men, TB incidence, proportion of immigrants and high school dropout had a higher probability of belonging in a high delay area. In the individual level analysis, median patient delay presented a constant increase, while healthcare delay remained constant, between 2008 and 2017. Alcohol abuse, unemployment and being from a high TB incidence country were factors significantly associated with longer patient delay, while being female, ≥45 years, oncologic and respiratory diseases were associated with longer healthcare delay.

Conclusions: Understanding the geographical variation of delays in TB diagnosis and identifying factors associated with longer delays at a geographical and individual level will contribute to better health policies and resource allocation.

A tale of two cities – differences in risk factors associated with delayed diagnosis of pulmonary tuberculosis in Lisboa and Porto areas

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Keywords: Healthcare delay; Patient delay; Public Health; Pulmonary tuberculosis; Tuberculosis control

Objective: To characterize patient and healthcare delays in diagnosing pulmonary tuberculosis (PTB) in clusters of higher PTB incidence in Portugal and assess their determinants considering clinical and sociodemographic factors.

Methods: PTB patients notified in the National Tuberculosis Surveillance System, between 2008 and 2017. Spatial analysis was used to identify clusters of higher PTB incidence. Descriptive statistics and Cox proportional hazards model were used to characterize patient and healthcare delays and estimate the effect of clinical and sociodemographic variables on these delays.

Results: Through spatial analysis, two clusters of higher incidence of PTB were identified: one including Porto and neighboring municipalities (n=23) and the other including Lisboa and neighboring municipalities (n=12). Between 2008 and 2017, in both areas, median patient delay (32 to 45 days - Porto; 40 to 56 days - Lisboa) increased, and healthcare delay remained relatively constant with a slight downward trend (7 to 6 days - Porto; 10 to 8 days - Lisboa). Alcohol abuse was associated with longer patient delay in both areas. Being from a high TB incidence country was only associated with longer patient delay in Lisbon and having an inflammatory disease in Porto. Being female and older age were associated with longer healthcare delay in both areas. In Lisbon, oncologic or respiratory diseases were also associated with longer healthcare delay.

Conclusions: Lisbon and Porto areas presented differences in terms of risk factors associated with longer delays in PTB diagnosis. Public health interventions should reflect these differences in order to have a greater impact in reducing the gap between the onset of symptoms and a PTB diagnosis.

"Geriatric Proximity" Intervention in the context of COVID-19: contribution to reducing loneliness and improving affectivity

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Keywords: Healthy Aging; Nursing models; Self-Care; Long-term care; Social Support

Objective: The aim of this research study was to assess the impact of the implementation of a Geriatric Proximity intervention on functionality, satisfaction with social support, affective experience, and feelings of loneliness in institutionalised older people.

Methods: This is a pilot study. An experimental group (subject to the intervention "Geriatric Proximity") and a control group were set up. Four assessment instruments were applied to both groups: the Satisfaction with Social Support Scale; the Elderly Nursing Core Set; the Positive and Negative Affects Scale and the UCLA Loneliness Scale.

Results: The control group shows no differences between the 3 measurement instants, while the experimental group does between the first and third measurement (all p<0.05), observing a reduction in the scale scores for loneliness, negative affect, and cognition functioning and an increase in satisfaction with social support and positive affect.

Conclusions: The intervention "Geriatric Proximity" showed a positive contribution, decreasing loneliness, increasing affectivity, satisfaction with social support and cognitive function in the pandemic period.

Depression prevention: midwife intervention to improve the quality of sleep in pregnant women

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Keywords: Perinatal Care; Mental Health; Sleep Hygiene; Health Promotion; Nurse Midwives

Objective: To analyze sleep quality and perinatal depression. To identify the nurse's intervention in improving sleep quality in pregnant women.

Methods: Data collection was carried out between December 2021 and March 2022 through an online questionnaire consisting of the following instruments: Edinburgh Postpartum Depression

Scale (EPDS), Pittsburgh Sleep Quality Index (PSQI), and three closed-ended questions about the nurse's intervention. The non-probability sample consisted of 53 pregnant women between the 28th week of pregnancy and the 7th day after delivery in a Lisbon and Tagus Valley Hospital. Non-parametric tests were carried out, p-value < 0.05 was considered statistically significant.

Results: The median PSQI score was 10 (±3.63), and 9.2% of the sample had good-quality sleep. The median EPDS score was 12 (±4.43), and 50.9% of the sample presented depressive symptoms. Most participants reported that the nurse showed no interest in their sleep quality during pregnancy. Statistically significant differences were identified between Portuguese women and women of another nationality concerning the presence of symptoms of depression, with women of another nationality having a higher risk of depression (p=0.013).

Conclusions: In obstetrics, the clinical decision is centered on women's health. This study provides insight into the need to promote sleep quality in the pregnant woman's care plan since poor sleep quality during pregnancy increases the risk of perinatal depression.

The effects of a sensorimotor exercise program for elderly on postural control

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Keywords: Sensory-motor system; postural control; Center of Pressure; Non-Linear analysis

Objective: The central nervous system regulates sensory information to produce adequate motor output while maintaining a controlled upright posture. The purpose of this study was to investigate the effects of a sensorimotor exercise program for elderly on postural control.

Methods: Two evaluations were carried out, through the biped test with eyes open (EO) and eyes closed (EC), for two minutes. Traditional parameters of the centre of pressure (CoP) data were analyzed, and nonlinear measurements were used to capture the temporal component of the CoP sway variation. Approximate entropy (ApEn) was used to characterize the system complexity and the correlation dimension (CoDim) used to quantify the control strategies to maintain a quiet posture. Eighty-eight participants (age 73.20±6.48 years; BMI 27.5±5.13). Were excluded participants with musculoskeletal diseases; problems in locomotion; psychiatric diseases and neurological disorders; and people with a clinical cardiovascular or cardiopathies. The Plux©(Portugal) portable wireless measure sway variation. Statistical tests were conducted with the Jamovi (Version 2.2.5) software. The analysis of variance (ANCOVA) was used to compare the effects pre- to post-intervention on postural control.

Results: The values of the nonlinear methods were significant from the first to the second evaluation, in ApEn in the anteroposterior position with EO and EC $F_{(1,85)}=15,5 <0,001$; $F_{(1,85)}=24,5 <0,001$, respectively; in ApEn in the mid-lateral position with EO and EC $F_{(1,85)}=18,16 <0,001$; $F_{(1,85)}=23,5 <0,001$. Significant differences between groups were found also in CoDim with eyes open in anteroposterior and medial-lateral direction $F_{(1,85)}$ p=16,88 <0,001; $F_{(1,85)}$ p=22,79 <0,001, respectively.

Conclusions: Our results show that the intervention caused differences in sensorimotor conditions that are fundamental for motor control and adaptability. The nonlinear measure such as ApEn and CoDim may provide further insight for exercise interventions.

Loneliness of older adults attending in portuguese residential homes

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Keywords: Aging; long-term care; social support

Objective: Quality social relationships are essential for people's physical health and well-being. Moving to a Nursing Home can mean distancing from family and friends, reducing the existing significant relationships. Loneliness is an adverse affective condition in which the quality of these relationships is diminished or does not exist at all, therefore, loneliness is felt as painful and it has negative repercussions on the physical and mental health of the elderly. Present study intends to describe the loneliness of older adults attending in residential homes.

Methods: A quantitative, descriptive, cross-sectional study was developed. The participants were 157 people aged 65 or over, living in residential homes, located in mainland Portugal, and were able to understand the questions of the assessment instruments. The assessment instruments used were a sociodemographic and clinical questionnaire and the Loneliness scale - UCLA-Loneliness for the portuguese older adults. Data collection took place in a pandemic context, so there were strict health regulations applied in the nursing homes as a response to the pandemic. These norms included the suspension of visits and the use of personal protective equipment.

Results: It was found that 64% of participants had negative feelings of loneliness. The older adults with higher scores of loneliness were those aged 85 and older, illiterate, widowed and who had multimorbidity (2 or more identified diagnosis areas).

Conclusions: In line with previous evidence, older adults living in residential homes have high levels of loneliness, which negatively influences their quality of life. Data collection took place during the pandemic and restrictive measures may have influenced the results. New studies are suggested for future comparisons, contributing to the development of care models suited to the real needs of this population.

How to promote health literacy in higher education students? Results from a qualitative approach

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Keywords: Disease prevention; healthcare; health literacy; health promotion

Objective: Health literacy (HL) has been acknowledged as a key pillar of public health and health promotion strategies. It is particularly important during university education when students can acquire and accumulate knowledge. This study aimed to propose a set of action strategies that promote HL in higher education students.

Methods: A qualitative approach was adopted, with the development of a Think Tank, which aimed to create a forum for reflection and debate about how to promote HL in higher education students. Three expert panels sessions conducted, covering a total of 28 experts of different areas and institutions (e.g., health, social, academic, political).

Results: A total of 54 strategies to action, divided into three axes (academic, community and political-strategic environments) were recommended. Among the strategies identified with a higher level of consensus among experts, we highlight the importance of Invite students to be an active part in the design and implementation of innovative projects, such as an App with iterative games, multimedia content or common resources to convey messages to the colleagues. Experts also recommended the construction of an action plan according to the assessment of students' real needs in the field of HL. Likewise, the need to define a political and intersectoral strategy for the integration of HL promotion in Curricular Plans and Curriculum Enrichment Activities was also highlighted.

Conclusions: This study reinforced the need of a collaborative (and participative) work between the community, students, student associations, teachers, schools, research centers for the design and implementation of innovative and effective projects to promote HL.

Which are the main divergences between the perception of people with T2DM and health professionals?

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Keywords: Diabetes Mellitus type 2; empowerment; information; patient participation; shared decision-making

Objective: To compare the most valued factors in consultations, perceived by people with Type 2 Diabetes Mellitus (PT2DM) and by HealthCare Professionals (HCP).

Methods: Cross-sectional study was conducted through two online surveys: PT2DM living in Portugal (N=464); and HCP that follow PT2DM (N=181). 15 factors were valued in a semantic differential of 10 scores, where the 0 is "nothing important" and 10 is "very important". Statistical analysis and Mann-Whitney U test at a 5% significance level were performed.

Results: Among 15 factors ranked, the highest valued factors in consultations from the perspective of PT2DM were: (1st) "clear information related to the disease" (9.03); (2nd) "sharing of up-to-date about medicines and technologies" (8.93) and (3rd) "clear and sincere speeches" (8.77). These same factors perceived by HCP are positioned in the ranking in 7th-position (8.07), 13th-position (7.64) and 5th-position, respectively. In all these factors the difference was statistically significant (p>0.05), revealing divergence between the perceptions.

Conclusions: The participation of the person throughout the care process is essential, in way that shared decision-making, and communication becomes more effective. In this analysis it is possible to understand that HCP don´t perceive in the same way which factors are most valued by people, highlighted by the differences between the perceptions (PT2DM vs HCP). Additionally, PT2DM value more the issues related to the information shared during the appointment, which allows to understand that people need to have qualified information for a better management of their disease, and to reinforce their empowerment.

Effects of movement-based processing speed training on attention and reaction time on community-dwelling older adults

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Keywords: Aging; Cognitive Functioning; Elderly people; Everyday performance; Neural systems

Objective: The main purpose of this study was to examine the effects of movement-based Processing Speed Training (MBPST), on attention and reaction time in community-dwelling older adults (>65 years).

Methods: The MBPST consisted of performing simple activities that require a rapid cognitive and motor response. The participants should perform all the activities in the less time possible. Twenty-two community-dwelling older adults ($80,6 \pm 8,6$ years) were engaged in the exercise program twice weekly for 8 weeks. The control group involved 21 participants (79.2 ± 5.5 years) with comparable characteristics. The cognitive functions were assessed using the d2 test of attention, which evaluates processing speed and attention, and the Deary-Liewald reaction time task, which evaluates simple and choice reaction time.

Results: At the beginning of the intervention, there were no statistically significant differences between the control and experimental groups. However, we identified statistically significant differences between the groups after the intervention period. The intervention group improved in all aspects assessed by the d2 test (more characters processed, more hits, and fewer errors) and in simple and choice reaction time (less response time). However, when the effect size (r and d_{ppc2}) is calculated, it is considered small for all components.

Conclusions: According to the collected data, the MBPST intervention can improve the processing speed, attention, and reaction time in community-dwelling older adults. Nevertheless, as the estimated effect size was considered small, studies with more robust samples and more extended intervention periods may be relevant.

Effects of an eight-weeks High-Speed Resistance Training program on physical function in Independent Older Adults

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Keywords: Older adults; Resistance training; Velocity-based training; Physical function

Objective: This study examined the effects of an eight-week high-speed resistance training (HSRT) program on physical function, through the handgrip test and three functional fitness tests.

Methods: This study included twenty-three physically independent older adults (age, 69.17 ± 4.53 years; BMI, 28.10 ± 4.66 kg/m^2). The HSRT program lasted eight weeks, with three sessions per week with 50–60min, each session being comprised of five-six exercises, two-three sets, and six–ten reps/exercise. The intensity was gradually increased after each session in accordance with the movement velocity (>1.3 to 0.75 m/s) representing approximately 20% to 60% of one repetition maximum. Participants executed the exercises rapidly and explosively making all repetitions for each shortening phase (concentric phase) performed as quickly as possible with the lengthening phase of the muscle (eccentric phase) being controlled for 2–3 s. The velocity of the concentric phase in each exercise was monitored through a BEAST™ sensor (Beast Technologies, Brescia, Italy). Outcomes were assessed through the handgrip test (both sides) and functional fitness tests (30s chair-stand; timed-up & go (TUG test); and ball throw test). The Ethics Committee of the University of Évora approved this study (approval no. 22030).

Results: After the intervention period, the functional fitness tests showed significant improvements: handgrip test on the right ($p=0.001$; effect size [ES]=0.52) and left side ($p>0.01$; ES=0.41); 30s chair-stand ($p<0.01$; ES=1.38); TUG test ($p>0.01$; ES=-1.17) and ball throw test ($p>0.01$; ES=0.52).

Conclusions: The results suggest that the HSRT program is an effective and safe exercise approach to improve physical function in older adults.

Telemonitoring as a factor in the adherence to self-care in the person with Heart Failure

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Keywords: Cardiac disease; e-healt; home monitoring; nursing care; self-management

Objective: Analyze if the implementation of a telemonitoring program contributes to self-care and management of the clinical situation

Methods: Systematic literature review using PICO to guide the research. We searched for articles on the EBSCOhost platform, selecting primary articles published between January 2017 and June 2022.

Results: Most of the selected articles revealed the existence of low self-care scores in people with heart failure. An increase in self-care and disease management scores were evidenced after undergoing nursing intervention programs using telemonitoring. One study showed clinical indicators with statistically significant differences in the telemonitoring group, especially B-type natriuretic peptide with lower values in the telemonitoring group.

Conclusions: The groups of people subjected to telemonitoring programs showed a more regular and systematized follow-up by the health team, with higher scores in self-care. The use of telemonitoring is an important strategy that nurses can adopt in nursing care, developing the educational component to promote the autonomy of these people. This relationship may contribute to the development of knowledge on the development of self-care skills.

The mediating effect of motivation on the relationship of physical fitness with volitional high-intensity exercise in adolescents

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Keywords: Body composition; Health; HIIT; Fitness; Physical Education

Objective: We aimed to investigate the relationship between physical fitness and motivation in adolescents and analyze if the associations of physical fitness with volitional exercise intensity in adolescents are mediated by motivation.

Methods: The participants were 109 adolescents (59 girls, 16.0 ± 0.92 years). Cardiorespiratory fitness (CRF) was assessed using the Yo-Yo Intermittent Endurance Test L1, and the push-up test was used to evaluate strength. Body composition was measured on weight scale with bioelectric impedance analysis. Volition intensity was assessed through a forearm wearable plethysmography heart rate (HR) sensor to ensure compliance with the exercise stimulus at the predetermined target HR zone (>=90%HRmax). Motivation was estimated prior to intervention with a validated questionnaire (BREQ-3). Mediation effects were estimated using bootstrapped 95% confidence intervals and were deemed significant if zero was not included in the intervals.

Results: The mediation analysis revealed a non-significant indirect effect of physical fitness through motivation on exercise intensity, specifically on CRF (B = 0.0044, 95% BootCI [-0.5089; 0.4458]), muscular fitness (B = -0.5797, 95% BootCI [-1.8695; 0.2584]) and body fat (B = 0.4044, 95% BootCI [-0.4292; 1.5525]).

Conclusions: These results suggest that high or low values of motivation did not increase or decrease volitional high-intensity exercise, and lower levels of fitness (CRF, muscular and body fat) were associated with higher volitional exercise intensity.

OUT to IN – a body-mind program to promote preschoolers' mental health

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Keywords: Children; mind-body; psychomotricity; self-regulation; social-emotional competence

Objective: Children's mental health promotion is paramount, especially in the early years. In preschool years children already have the capacity to consciously detect changes in their body states, the so-called interoception. Interoception seems to shape regulatory abilities, therefore playing a key role in preschoolers' mental health. Based on this assumption, OUT to IN, aimed to study the effects of a psychomotor intervention program on social-emotional competence of preschoolers.

Methods: OU to IN has been developed and implemented in Portuguese preschools, following a randomized controlled design. The study included 271 children between 3 and 5 years (143 males). The 179 who were allocated to the Experimental Group participated in biweekly sessions for 10 weeks. The sessions followed a mind-body approach comprising exercise play, relaxation, and expressive activities, implemented outdoors by a psychomotor therapist. Sessions enabled children to feel and observe their bodily states and understand the relationship between their bodies and emotions. The program involved a progression of goals, from interoception to body schema, self-regulation, and communication.

Results: This work unravels the intervention program's rationale, design, and preliminary outcomes, which suggest the efficacy of OUT to IN, promoting children's interoception and self-regulation.

Conclusions: The OUT to IN program offers a promising approach to enhancing preschoolers' social-emotional competence.

The feasibility of a mind-body program implemented with breast cancer survivors

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Keywords: Oncology; psychomotricity; relaxation; survivorship; tolerability

Objectives: The increasing number of breast cancer survivors has been demanding non-pharmacological therapeutic approaches addressing the social-emotional needs of this particular population. Relaxation interventions have been pointed out as a beneficial therapeutic approach for women who have survived breast cancer (WSBC). However, research on these interventions' feasibility and effects is scarce. In particular psychomotor relaxation enables women to feel, get to know, trust and discover the possibilities of the new body. This study aimed to examine the feasibility of a psychomotor relaxation program aiming to promote the health and well-being of WSBC.

Methods: Eighteen women breast cancer survivors (51.67 years ± 8.20) were allocated to the Psychomotor Relaxation Group, which participated in bi-weekly relaxation sessions for 8 weeks, and to the Control Group, which maintained their routines. Feasibility was examined through Abbott's indicators.

Results: The access to participants' recruitment was easy. The main barriers to attendance to the intervention were the home-hospital distance and the incompatibility of work-sessions schedules. The feasibility and suitability of assessment procedures and outcome measures was verified. In particular, the evaluation procedures were well tolerated by WSBC. Regarding the intervention program, there was a 100% attendance rate, and participants were highly receptive to the proposed activities, showing autonomy and interest in their correct performance. As the sessions progressed, participants became more capable of focusing their attention on their bodies and regulating arousal.

Conclusions: The findings show the feasibility of this study, suggesting that psychomotor relaxation is a viable and well-tolerated non-pharmacological approach for WBCS.

Does graphomotor intervention influence handwriting variability?

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Keywords: Correlation dimension; sample entropy; variability; children

Objective: The purpose of this study was to investigate: 1) the variability's structure after a graphomotor intervention; 2) the variability's structure 6 months after the intervention.

Methods: 41 children (8-9 years) performed a 5-minute copy on a digitizing table, in three moments: before and after intervention and 6 months later. Movements were recorded using an x-y digitizing tablet with an inking pen and MovAlyzeR®. Nonlinear dynamic parameter sample entropy (SamEn) was used to assess the pattern of the regularity of sample kinematic time series, and the correlation dimension (CoDim) to characterize control strategies of handwriting. The intervention program was developed during 16 sessions (30'), twice a week, in small groups.

Results: We found significant differences in the horizontal component of SamEn and CoDim in the intergroup analysis from the pre to the follow-up moment. In both variables, the trend is increasing with the control group assuming higher values. Children with the intervention became less regular in the horizontal component, but with a different level of control, and greater adaptability.

Conclusions: It is concluded that the children became aware of the strategies learned but only after the intervention they visibly apply them, with repercussions on the copying task. Nonlinear methods are an important tool to quantify changes in graphomotor behavior.

Predictive value of daily monitoring of biomarkers in COVID19 patients' mortality rate: a prospective cohort study

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Keywords: C-reactive Protein; COVID19; Intensive Care Unit; Mortality rate; Procalcitonin

Objective: COVID-19 emerged as a new form of acute respiratory failure leading to multiorgan failure and ICU admission. Gathered evidence revealed conflicting data about the predictive value of C-reactive Protein (CRP) and Procalcitonin (PCT), as

biomarkers, of poor outcomes in these patients. Our aim was to access the value of daily measurements of CRP and PCT in the early identification of non-surviving Intensive care unit COVID19 patients.

Methods: We undertook a prospective cohort study (12-month period). All patients with confirmed COVID19 pneumonia admitted to ICU care for ≥72 hours (n = 124) were divided into a surviving group (n= 97) and non-surviving group (n=27). The progression of serum CRP and PCT was analyzed in both groups using a linear mixed model method.

Results: CRP showed to remain increased in non-survivors while, in survivors, it presented a continuous decrease. This statistical difference was present from day 4 after ICU admission and remained significantly different between those groups. PCT serum levels remained almost unchanged in both groups (time dependent analysis p= 0.042 and p=0.356, respectively). The areas under the curve for the maximum CRP and PCT values registered during ICU length of stay, in mortality prediction, were 0.753 and 0.691, respectively.

Conclusions: Daily CRP monitoring could be useful as an early predictive biomarker of mortality COVID19 patients in ICU, while PCT monitoring does not seem to retain predictive value in the clinical outcomes of these patients.

Technology in sports and health, and its implications for sports literacy – an exploratory approach

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Keywords: Human movement; performance analysis; physical education

Objectives: The advances in technology to collect human kinetics data and robust data processing methodologies can contribute to improve sports and health interventional programs. The current research project aims to implement an innovative methodology for collecting and processing human movement data, and quantify the effects of pedagogical interventions in sports settings.

Methods: A constraint-led approach program was designed and applied during six physical education classes. A total of 29 students of two 10th grade secondary classes were part of the study with a pre-post test design to evaluate the effects of the interventional program. Positional data were collected with GPS units and through video footage. MATLAB algorithms were created to process the data, export specific datasets for analysis and explore behavioral position-derived variables.

Results: Overall, the data approaches provided practical and holistic processing tools that can be used to better understand sports literacy. Furthermore, the participants' positioning during physical education classes was incorporated in a complex approach where the different dimensions of analysis complement each other to identify functional rules that underlie the collective movement behavior. As a result, students have increased their collectiveness awareness to solve tactical constraints promoted by the sports environment.

Conclusions: This innovative framework opens new venues to understand the human movement variability in team sports and to analyze the effectiveness of interventional programs in school contexts. Broadly, the success of intervention programs may enlighten sports literacy in youth and nurture engagement in sports throughout lifespan, which may positively impact public health.

A time and frequency domain relation between Heart Rate Variability with Elite HRV® and Kubios HRV Standard®?

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Keywords: App; Heart Rate; R-R interval; Signal processing; Wearable

Objective: Wearable technology and phone apps are overtaking heart rate variability evaluation. The assessment involves analysis of R-R interval data using time and frequency domain metrics that are convenient and reliable markers of cardiovascular abnormalities and autonomic nervous system activity. Elite HRV®, a mobile app, tracks heart rate variability metrics. Often, its raw data is processed by other software, as Kubios HRV®, and its treated metrics are not used because their degree and technique of artifact reduction are unknown. Our study compares Elite HRV® and Kubios HRV Standard® 3.4.3 metrics in the time and frequency domains.

Methods: Heart rate variability data from a single healthy male was extracted over seventy-one days in the morning in the supine position using a Polar H10 in conjunction with the Elite HRV® app at a sampling rate of 1,000 Hz. The same time and frequency domain metrics were extracted using the Elite HRV® app and Kubios HR. Kubios HRV® used uncorrected R-R interval raw data from the Elite HRV® app. No further correction was applied. Pearson's product moment or Spearman's rank was applied according to the Shapiro-Wilk test.

Results: Only the MRRI and the HF peaks showed a normal distribution. All metrics showed significant positive correlations between the software ($p<.001$). The time domain indices showed very strong relations within the same metrics (r_{HR}=.98, r_{RMSSD}=.93, r_{MRRI}=.99) except for SDNN (r=.49). In the frequency domain, only the LF Peaks indices presented a moderate relation (r=.43) while other metrics showed strong ($r_{LF/HFratio}$=.89, r_{HFPeak}=.77) or very strong relations ($r_{LFPower}$=.98, $r_{HFPower}$=.93).

Conclusions: While the Elite HRV® app and Kubio's HRV® Standard artefacts correction appear to alter mainly LF peaks and SDNN indices, they largely provided equivalent metrics in the time and frequency domains.

Determinants of depression in older adults during the pandemic by COVID-19

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Keywords: Crisis; Depressive symptoms; Health policy; Older adults, Pandemic consequences

Objective: To describe the determinants of depressive symptoms in adults aged 60 years and older related with the COVID-19 pandemic.

Methods: This study adopts a systematic literature review and the search was conducted in several databases to identify eligible studies that were published between December 2019 and March 2022.

Results: Thirty-eight studies were included. We grouped the results into 3 categories: 1) Stress-related factors and feelings or worries related to the pandemic COVID-19 concerns, such fear of infecting other people and feelings regarding the high mortality due to COVID-19; 2) receiving news about COVID-19 in social media; and 3) Factors related to the measures that were taken to reduce the spread of COVID-19, such containment measures, difficulty receiving medical care. All of these determinants were associated with higher rates of depression.

Conclusions: There are some determinants related to the COVID-19 pandemic, such as some of the measures adopted, that increased depressive symptoms. This knowledge is useful for health policies to prevent depressive symptomatology in similar crisis situations.

Functioning of institutionalized older adults in residential homes, structure and care process

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Keywords: Aged; Healthy Aging; Institutionalization; Self Care; Social Support

Objective: To characterize the functioning of older adults institutionalized in residential homes, the respective context and care process. The scope of this work arises from the Master's in Nursing Studies, University of Évora. This study is relevant to the community in general, because the Portuguese population is demographically aged; to the social domain, since residential homes are the context of this study; to the health sciences - due to the increasing need for health care by older people with self-care deficits; and to the quality in health, since this study is based on Donabedian's assumptions.

Methods: This was a cross-sectional quantitative study, with the application of questionnaires to a sample of 712 institutionalized older adults and 25 interviews with the people in charge of the institutions. Three scales were applied to assess functioning, cognition and dementia symptoms: the Elderly Nursing Core Set, the Mini Mental State Examination and the Blessed Dementia Scale, respectively. Structured interviews were carried out to assess the structure and process of care. Data were collected between the second half of 2019 and the first half of 2021.

Results: It was found that female gender and illiterate older adults have a worse functional profile, greater cognitive impairment and a higher degree of intellectual and personality deterioration. There were no statistically significant differences between functioning, cognition or dementia symptoms and the presence of multimorbidity and marital status. There are discrepancies between the contexts and care processes of the institutions.

Conclusions: It is necessary to redesign the context of these institutions through a care model focused on the well-being of older adults. Thus, it is necessary to adopt practices aimed at self-care through a care model focused on promoting the independence and autonomy of institutionalized older people.

Benefits of a psychomotor intervention in processing speed and reaction time depending on the baseline functioning

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Keywords: Aging; Executive functions; Functionality level; Neuroplasticity; Older adults

Objective: This study analyzed the effect of a 12-week psychomotor intervention program on processing speed and reaction time, considering the baseline functioning of community-dwelling older adults.

Methods: Eighteen older adults (mean age: 74.1±5.3 years) underwent a psychomotor intervention designed to stimulate neuroplasticity. Outcome measures included: Trail Making Test – Part A (TMT-A: s) assessing processing speed, and Deary-Liewald reaction time assessing Simple Reaction Time (SRT: ms). Participants were divided into the low-functioning group (LFG) and the high-functioning group (HFG), according to their baseline functioning. Wilcoxon and Mann-Whitney tests were used.

Results: Significant improvements were found between the baseline and post-intervention, in both groups, in TMT-A (LFG: 111.3±29.4 vs. 84.1±34.1, $p = 0.021$; HFG: 69.6±8.0 vs. 52.2±8.6, $p = 0.011$). In addition, significant improvements were also observed within LFG, in the variable SRT (590.7±197.5 vs. 399.9±79.3, $p = 0.028$). Significant between-group differences were detected at post-intervention in the variable TMT-A (LFG: 84.1±34.1 vs. HFG: 52.2±8.6, $p = 0.003$). The effect size (r) was large within (0.54-0.60) and between (0.68) groups.

Conclusions: Our study showed that the 12-week psychomotor intervention induced improvements in processing speed, in

both low- and high-functioning groups, and in reaction time, in the lower-functioning group. These findings suggest that low-functioning older adults have a high potential to improve their cognitive function through a psychomotor intervention that stimulates neuroplasticity.

Effects of a psychomotor intervention in physical function according to baseline functioning

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Keywords: Aging; Balance; Lower-body strength; Mobility; Older adults

Objective: This study evaluated the effect of a 12-week psychomotor intervention program on community dwellings' physical function considering their baseline functioning.

Methods: Eighteen older adults (74.1±5.3 years old) were assigned to a psychomotor intervention and assessed for mobility by the Timed Up and Go test (TUG: s), for balance by the Fullerton Advanced Balance scale (FAB: points), and for lower-body strength by the 30-s chair stand test (30CST: rep-30s). A physical function composite variable was computed as the sum of standardized TUG, FAB, and 30CTS results. In accordance with their baseline functioning, participants were allocated into the low-functioning group (LFG) and the high-functioning group (HFG). Wilcoxon and Mann-Whitney tests compared physical function composite data.

Results: Significant differences were found between the baseline and post-intervention, within LFG, in the physical function composite, improving 13.1% (-3.23±0.5 vs. -2.81±0.6, $p<0.001$). Between-group differences were also found at post-intervention in the previous variable (LFG: -2.81±0.6 vs. HFG: -1.50±0.6, $p<0.001$). The effect size (r) was large within LFG (0.83), and between groups at post-intervention (1.06).

Conclusions: Results showed that the psychomotor intervention had an effect mainly within LFG, improving participants' physical function by enhancing their mobility, balance, and lower-body strength. However, the functional capacity of the HFG participants remained higher compared to the LFG. These findings suggest that inter-variability in participants' physical function should be considered in the design of psychomotor interventions.

Being deaf in the playground – impact on preschoolers' social-emotional functioning

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Keywords: Cochlear implant; emotion understanding; hearing aid; hearing impaired; social inclusion.

Objective: Impairments in the auditory system can cause different developmental difficulties, beginning in early childhood. Besides language delays, many studies also report impairments in social-emotional functioning of children who are Deaf and Hard of Hearing (DHH). However, this is a heterogeneous group, and factors such as the age of implantation and the type of hearing aid can influence social-emotional development. The "Being Deaf at the Playground" is an international project aiming to understand DHH's social-emotional functioning.

Methods: Following a multi-method, multi-informant, and ecological approach, this research project involved 32 DHH (Mage= 58.06 months, SD=11.06) and 152 (Mage= 59.88 months, SD=11.40) typically hearing (TH) Portuguese children. Social-emotional functioning was obtained through parents' and teachers' reports and tasks performed by the children. Play behaviors and social interactions in the preschool playground were observed and measured through systematic observation and the innovative method of radio-frequency proximity sensors.

Results: Although preliminary, our results show that, in general, preschoolers who are DHH lag behind in their emotional understanding compared to their TH peers. Also, DHH children show more behavioral problems and are less accepted and more often ignored by their peers, thus spending more time alone. Despite the small sample size, children with cochlear implants seem to have better social-emotional functioning than those with hearing aids.

Conclusions: Portuguese DHH preschool children seem to face difficulties regarding their emotional development and peer interactions. Understanding and intervening in the preschool years seems required to promote DHH children's development and the sense of belonging within the peer group.

Analysis of the Concept of Obstetric Violence: Preliminary Results of a Scoping Review

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Keywords: (MeSH terms): labor, obstetric; violence; woman

Objective: This concept analysis aims to understand how to characterize the term obstetric violence related to the care of women in labor.

Methods: scoping review is carried out, according to the Joanna Briggs Institute method, for the identification and selection of articles, being the starting point for a conceptual analysis based on the Rodgers' evolutionary method. The search was carried out in the following databases: CINAHL Complete, PubMed/MEDLINE and Virtual Health Library. All types of studies, published in the last 10 years, in English, Spanish and Portuguese languages, addressing women's experience, related to obstetric violence in the context of labor, in hospital institutions, were included. To collect, store, organize and select the references, Rayyan software was used.

Results: At the moment, the sample of articles selected and analyzed, based on Rodgers' model showed among the main antecedents of the concept, the hegemony of the biomedical model and the overmedicalization of childbirth; the disempowerment and vulnerability of women; the precariousness and inequities in the quality of obstetric care and the naturalization of structural violence in health systems. In its conceptualization the essential attributes include undignified, non-consenting, and non-confidential care; physical abuse; discrimination and neglect; and undue detention of women in health care facilities. Its consequents relate to complications of maternal-fetal well-being and the traumatic experience of childbirth.

Conclusions: It is hoped that this study, not yet completed, will allow a better operationalization and clarification of the concept of obstetric violence.

Infertility in the Anthropocene: unravelling the impact of obesogens

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Keywords: Environmental contaminants; reproductive axis; spermatogenesis; Sertoli cells; sperm quality

Objective: Male infertility has been sharply increasing, yet the mechanisms behind such phenomenon are yet to be fully elucidated. Recent evidence suggests that obesogens are major contributors to the marked decline of male fertility and key players in shaping the future health outcomes not only for those who are directly exposed but also for upcoming generations. Furthermore, besides the changes responsible for the inefficient functioning of the male gametes, obesogens induce alterations that are "imprinted" on the genes of the male gametes, establishing a link between generations, and contributing to the transmission of defects. Unveiling the molecular mechanisms by which obesogens induce toxicity that may end-up in epigenetic modifications is imperative. This work aimed to describe and discuss the molecular targets and potential mechanisms for obesogenic–disrupting chemicals and the subsequent effects on male reproductive health.

Methods: Narrative review on the implications of exposure to obesogens on male reproductive impartment.

Results: The available data suggests that obesogens have a negative impact on the reproductive function. This impact maybe mediated by changes in the hormonal levels and the HPT axis or/and by direct changes in the reproductive tissues. However, the exact mechanisms are still not completely understood.

Conclusions: Despite the increasing evidence on the role of obesogens on male infertility, there are still several aspects that require further investigation. Future work should focus on elucidating the exact molecular mechanisms and elucidating the adverse outcome pathways (AOPs).

The RESPIRA Project: Levels of environmental contaminants in patients with chronic respiratory diseases in Estarreja region

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Keywords: Antimicrobials; Biomonitoring; COPD; Mercury; Parabens

Objective: The study of indoor quality as well as the development and progression of chronic respiratory diseases has received a great deal of attention in the past few years. However, most of those surveys focus on single contaminants exposure. RESPIRA project aimed to better understand the role of multiple stressors in respiratory diseases by providing a multidisciplinary approach to the environmental determinants of health. The main objective of this study was to quantify the levels of phenolic compounds (including parabens and antimicrobials) in patients with Chronic Obstructive Pulmonary Diseases and matched controls.

Methods: Patients and matched controls from Estarreja region were recruited at Estarreja hospital. Hair, nails, blood, and urine samples were collected, and the participants were asked to provide dust samples. Parabens and antimicrobials were quantified in human and environmental samples by LC-MS/MS.

Results: Generally, the concentrations of parabens, triclosan and triclocarban found in dust samples were one to two orders of magnitude higher than the concentrations found in urine. Parabens were the largest contributors to the levels of phenolic compounds detected in both urine and dust samples. No significant differences between patients with COPD and controls for all the analyzed compounds were found (Mann- Whitney U test, p>0.05).

Conclusions: Triclosan was the preferred antimicrobial being detected in all house dust samples (detection frequency 100%). Such high detection frequency was also expected as these patients tend to be extra careful in the disinfection of their houses to prevent exacerbations due to respiratory infections.

Reliability of a simple, dual-task and inhibition ruler drop test in older adults – Preliminary results

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Keywords: Elderly; multi-task; reaction time; test-retest; yardstick test

Objective: This study aimed to observe the reliability of the ruler test with a dual task and with an inhibition task.

Methods: Forty-two older adults living in the community participated in this study. The participants were evaluated on two occasions (test and retest) seven days apart. All participants did a familiarization moment. Simple ruler drop test (SRD) was performed with the dominant hand. In the dual task ruler drop test (DTRD), the participant had to count backward from 100, every 2, and simultaneously pick up the ruler. In the inhibition ruler drop test (IRD), the evaluator would drop the ruler and simultaneously say a letter. (A, B, or C). The participant was instructed to pick up the ruler only when he heard the letter B. Whenever the participant heard the letter A or C, he should not grab the ruler. In all tests, the participant needed to catch the ruler as quickly as possible.

Results: Relative reliability was measured by the Intraclass Correlation Coefficient (ICC3.1) and the results showed that was good for the IRD (ICC = 0.77), DTRD (ICC = 0.74), and moderate for the SRD (ICC = 0.65). IN DTRD, we evaluated the number of errors and the number that the participant achieved. The relative reliability was moderate (ICC = 0.73) and good (0.987), respectively.

Conclusions: The results demonstrated that DTRD and IRD could be suitable to evaluate the reaction time with dual task and with an inhibition task, respectively. Reaction time is a very important variable for the daily living activities of elderly people, namely for the balance. It is important to evaluate this variable with other conditioning factors, since in our daily basis, we work with several types of reaction time.

Cardiometabolic risk and SARS-CoV-2 infection: the patient's journey

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Keywords: Cardiometabolic risk; infection with SARS-CoV-2 virus; intensive care unit

Objective: To characterise the cardiometabolic risk in individuals infected with SARS-CoV-2 admitted to a central hospital in a large city in mainland Portugal.

Methods: Retrospective exploratory study conducted with a sample of 102 patients, with statistical analysis of the data, including descriptive analysis, non-parametric measures of association between variables based on Spearman's correlation coefficient, a logistic regression model and a linear regression model. The variables considered in this study were gender and age, the number of days between the positive COVID-19 test result and hospitalisation, the number of days between hospitalisation and admission to the Intensive Care Unit (ICU), the number of days in the ICU, the individual's cardiometabolic diseases (obesity, diabetes, dyslipidemia, hypertension and cardiovascular diseases) and whether or not there was death at the end.

Results: We found that 62.7% of participants required intensive care on the second day of hospitalisation, with an average of 14.2 days in the intensive care unit (ICU). The probability of an individual dying due to SARS-CoV-2 infection was higher for older patients than for younger patients, this result increased with the presence of cardiometabolic diseases, such as obesity, and cardiovascular diseases. Older patients, with obesity and hypertension, stayed more days in the ICU.

Conclusions: The prevalence of cardiometabolic diseases was found to be higher among older adults than among younger adults. The probability of an individual eventually dying increases with age and even more so with the prevalence of cardiometabolic diseases such as obesity, especially CVD. In other words, the prevalence of cardiovascular disease and advanced age seriously affect the management of patients infected with the SARS-CoV-2 virus.

Mercury and Blood Pressure Levels in Inhabitants from a Highly Industrialized Region in Northern Portugal

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Keywords: Biomonitoring; Exposure assessment; Hypertension

Objective: Estarreja is a highly industrialized municipality in NW Portugal, well known for its historical mercury contamination. Mercury exposure is a serious risk to human health (cf. Minamata Disease), and due to its widespread occurrence and persistency, it is recognized as a priority substance. Amongst the myriad deleterious effects of mercury on human health, hypertension has only recently gained attention. The aim of this work was to evaluate the levels of mercury in matched dust and hair samples from inhabitants of Estarreja; and to study possible associations between hypertension and mercury.

Methods: House dust and hair samples from the residents of Estarreja were collected, together with systolic (SBP) and diastolic (DBP) blood pressure measurements. Mercury levels were analyzed by CV-AAS.

Results: Levels of mercury in dust (93–9100 ng/g) were, on average, higher than those in hair (624–4535 ng/g). No statistically significant association between dust and hair could be established (Spearman Rank Order Correlation, p=0.199), reinforcing that dust is not the major exposure pathway to this toxicant. Twenty-eight per cent of the participants were hypertensive. No statistically significant differences in mercury levels between the hypertensive and normal group were found (One-tailed P-value=0.444). No significant associations between SBP (p=0.826) or DBP (p=0.695) and hair mercury levels were obtained.

Conclusions: Overall, 72% exhibited levels higher than the acceptable dose set by the USEPA (1000 ng/g), and 44% of individuals exhibited hair mercury levels higher than the WHO acceptable dose (2000 ng/g).

Mycotoxins contamination in Brazilian coffee industry – The need of a One Health Approach

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Keywords: Coffee; mycotoxins; occupational health; food safety; One Health approach

Objective: This work aims to characterize mycotoxins contamination in two coffee industries from Brazil using as sampling methods settled dust and coffee beans.

Methods: A total of 58 samples from the two coffee industries were assessed (20 settled dust, 20 filters used to vacuum the settled dust and 18 coffee beans) and screened for mycotoxins presence. In all samples, 38 mycotoxins were analyzed by HPL-MS ((HPLC) Nexera (Shimadzu, Tokyo, Japan) with a mass spectrometry detector API 4000 (Sciex, Foster City, CA, USA). The mycotoxin concentration was calculated using external calibration.

Results: In settled dust all the samples showed contamination by at least one mycotoxin being the most reported mycophenolic acid and ochratoxin A. In addition, more three mycotoxins were detected namely: fumonisin B1, ochratoxin B and zearalenone. Three (15%) samples showed contamination by three different mycotoxins and twelve (60%) by two mycotoxins. In the coffee beans samples, four mycotoxins were detected (aflatoxin B2, fumonisin B2, ochratoxin A and mycophenolic acid) being the most reported mycophenolic acid with 4 samples (20%) presenting contamination by two different mycotoxins.

Conclusions: The observed mycotoxins´ contamination highlight the need to consider this occupational environment as critical in what regards occupational exposure to this risk factor. In addition, it also pinpoints a potential menace concerning food safety since mycotoxins are not degraded in the coffee processing treatments. Future research should include a One Health approach to tackle the different risks in this setting.