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Abstracts

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Cytotoxicity of contaminated protection devices used in waste sorting industry

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Keywords: A549 cells; cytotoxicity; hep G2 cells; mechanic protection devices; MTT formazan; respiratory protective devices

Objective: This study evaluated the cytotoxicity of contaminants present in protection devices used at work in a waste sorting industry.

Methods: One waste sorting industry in Lisbon was selected for the collection of filtering Respiratory Protection Devices (RPD) (n=118) and mechanic protection gloves (MPG) (n=67) used by workers. The MTT formazan assay was used to determine cell viability of different cells exposed to contaminated RPD (interior layer (IL) and exhalation valves (EV)) and MPG. Human epithelial lung (A549) and swine kidney (SK) cells were exposed to test dilutions of RPD; SK and hepatocellular carcinoma (Hep G2) cells were exposed to test dilutions of MPG.

Results: Half-maximal inhibitory concentration (IC50) in lung cells was lower for RPD-IL than RPD-EV, with IL exhibiting higher overall cytotoxicity than exhalation valves ($z = -4.455$, $p = 0.000$). High cytotoxicity (IC50 < 0.05 mm^2/ml) was observed in HepG2 cells for 18 out of 57 MPG.

Conclusions: Contaminated RPD exhibited moderate cytotoxicity on epithelial lung cells, whereas contaminated MPG exhibited high cytotoxicity on hepatic cells. The effects on workers' health resulting from exposure to contaminants present in the waste sorting industry, either by inhalation or ingestion route must be further investigated.

Occupational and Environmental Health: Research that provides scientific data to support policy action

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Keywords: Environmental health; occupational health; research; science to policy interface

Objective: The dynamic interaction between science and policy is fundamental to progress in populations' health and wellbeing. Environmental and Occupational Health sciences are especially important to this progress through dedicated policies and by a circular process: new science should imply new policy, better practices and new questions.

Methods: A first survey of the projects developed since 2016 was performed. Background information from each project was collected to identify the aims, the foreseen outputs and which policy action/regulatory framework the project could support.

Results: Ten research projects were identified and all provide scientific inputs that can be translated into policy action in different areas such as: (i) environmental health (chemical exposures and respective drivers and actions to be taken to reduce exposure; establishing the evidence base for reducing the risks and burden of disease from chemical exposure including workplace risk factors exposure, and health impact assessment of priority chemicals; climate change implications on public health and actions needed to adapt to different patterns of chemical exposures) and (ii) occupational health (new exposure limits, criteria for defining new workplaces working conditions, and to implement new risk management measures, particularly in the context of the pandemic situation).

Conclusions: The major conclusion from this analysis is the need for a straight connection between researchers and policy actors, implying that research data should be adequately translated to be easily used by the policy actors and that further work is needed to strengthen the science to policy interface.

Exposure to several risk factors in the e-waste management industry

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Keywords: Occupational health; environmental health; research; e-waste management; chemicals; WRMSDs

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 such as metals, flame-retardants and phthalates. Additionally, recycling is a repetitive and musculoskeletal demanding activity for e-waste workers. Work-related musculoskeletal disorders (WRMSDs) may impair the health and the quality of life of many workers, being a burden in e-waste occupational settings. WRMSDs prevention programs are mandatories in the large companies that are doing e-waste management. The present study aims to identify potential hazards and improve the protection of the

worker's health from the risk of exposure to chemical substances and the development of WRMSDs.

Methods: Under the project HBM4EU, a cross-sectional study is being developed in e-waste management companies in nine European countries, including Portugal, that will imply the collection of biological samples (urine, blood, hair), industrial hygiene samples (settled dust, air samples and wrist/wipe samples), and the application of questionnaires (sociodemographic, working conditions).

Results: Data will be analyzed and integrated to characterize the risk associated with exposure to chemicals and the risk of developing WRMSDs.

Conclusions: Altogether, these data will contribute for the implementation of risk management measures intending to decrease the burden associated with the exposure to chemicals and the development of WRMSDs in this occupational setting.

The relationship between Obesity, Hospitalization and Health-care Costs in Portugal: Preliminary Results

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Keywords: Obesity, hospitalization, healthcare costs

Objective: The objective of this study was to evaluate the association between obesity and hospitalization and their respective costs.

Methods: A cross-sectional study at the baseline of the Chronic Disease Epidemiology Cohort (EpiDoC Cohort). Hospitalization was treated as a binary variable (yes/no) and categorized according to the Homogeneous Diagnostic Group (GDH). We collected Body Mass Index through the self-reported height and weight and categorized according to the World Health Organization (WHO) classification in four categories: underweight <18.5kg/m^2, normal weigh =18.5 to 24.9kg/m^2, pre-obese =25 to 29.9kg/m^2 and obese ≥ 30kg/m^2. For the purpose of this study, we use only obesity as binary variable. The costs per event were estimated using the average price of the severity levels of each identified GDH. The total cost was obtained through the product of the average price of each hospitalization episode and its frequency of occurrence. Logistic regression was used to examine associations between obesity and hospitalizations. All analyzes were performed using STATA version 15, considering a significance level of 5%.

Results: 10,661 individuals were included, 20.6% of whom were obese. Only 9% were hospitalized, of which 2.3% were obese, 66% were women and the mean age of was 57 years. Diseases of musculoskeletal, digestive, and circulatory systems were the main causes of hospitalization. Individuals with obesity had a 22% (95% CI = 21,9%–27,6%) (p-value=0.02) higher risk for hospitalization than did those without obesity. The total cost of hospitalizations was EUR 4 million. The hospitalizations cost per person was 13% higher among obese individuals, 5,156 euros (± 203) per person-year than non-obese individuals, 4,846 euros (± 133) per person-year.

Conclusions: Obesity was associated with higher hospitalization and increases the costs of this outcome in the Portuguese population being so an important indicator to predict the scenario for the country's health system.

The effects of whole-body vibration on the management of osteoporosis in early menopausal women

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Keywords: Early menopause, osteoporosis, whole body vibration, BMD

Objective: The objective of this study is to examine the effects of whole-Body Vibration (WBV) on bone mineral density (BMD) and bone turnover markers in women diagnosed with early menopause as a means for reducing the risk of developing osteoporosis and subsequent increased fragility fracture later in life. To the best our knowledge this is the first study to examine WBV in early menopausal women who reach menopause before the age of 45.

Methods: A minimum of 30 early menopausal women (>40–<45 years old, GROUP 1), and 60 normal postmenopausal women (> 51 years old, GROUP 2) will be recruited from the Menopause clinic of Maternidade Dr. Alfredo da Costa and rheumatology consultation at Hospital Santo Antonio dos Capuchos in Lisbon. In each group, half the participants will be randomly assigned to the WBV group, and the other half will be assigned to the control- group (step @ home). In this way, out study satisfies the randomized control trial (RCT) conditions.

Results: Biochemical analysis of bone turnover markers, namely Osteocalcim and Osteopontin, which are known for their role in the bioregulation of the bone mineral phase, as well as BMD measurements will be performed at baseline, 4 and 8 months for both groups.

Conclusions: The project aims to study strategies for improving BMD and modify fall-related factors by increasing balance and muscle strength in women with early menopause diagnosis, who are considered at a higher risk of developing osteoporosis and increased fragility fracture later on in life than normal menopausal women.

Assessment of Psychosocial Risk Factors in Nurses one year after the start of the COVID-19 pandemic

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Keywords: COVID-19; nursing; psychosocial factors; risks; well-being

Objective: To assess psychosocial risk factors in Portuguese nurses one year after the pandemic.

Methods: A questionnaire in digital format consisting of a sociodemographic and professional component and the COPSOQ II scale was applied, which assesses the psychosocial risks that influence health and well-being. The total sample is 188 nurses.

Results: All nurses reported that the COVID-19 situation increased psychosocial risk factors at work level, with an average intensity of 8.54 (scale 0-10). In fact, 91.5% said that life will never be like it was before the pandemic. The factors that showed the greatest impact on health and well-being were cognitive demands (M=4.13) emotional (M=3.95), meaning of work (M=3.93) and high work rate (M=3 .86). In the mean values of the COPSOQ II scale, there were no significant differences regarding gender (Pillai's trace=0.206, F(35.152)=1.129, p=0.167. Age was significantly correlated with cognitive requirements factors (r=0.165; p=0.024), influence at work (r=0.248; p=0.001), social support from superiors (r=0.150; p=0.040), quality of leadership and headship (r=0.175; p=0.016), justice and respect (r=0.144; p=0.048), commitment to the workplace (r=0.202; p=0.005), job satisfaction in general (r=0.224; p=0.002) and sleep problems (r=0.168; p=0.021).

Conclusions: One year after the start of the pandemic, nurses feel physically and emotionally exhausted due to the high work rate and not very optimistic about the improvement of the situation. The older the age, the more positive is the perception of influence at work, social support from superiors, quality of leadership and headship, justice and respect, commitment to the workplace and job satisfaction.

Microbiologic contamination present in mops and cloths used for cleaning procedures in firefighters' headquarters

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Keywords: Azole resistance; *aspergillus* sp.; *aspergillus* section *Fumigati*; qPCR

Objective: The study aimed to characterize the microbial contamination (bacteria and fungi focusing on *Aspergillus* section *Fumigati*) through passive sampling methods (14 mops and 25 cleaning cloths) in 11 firefighters' headquarters of Lisbon.

Methods: Viable bioburden through culture-based methods and azole resistance profile (following the protocol adapted from the EUCAST 2018) were obtained. Molecular tools were used for detection of *Aspergillus* sections, namely *Aspergillus* sections *Fumigati* and *Nidulantes*.

Results: Regarding to microbial contamination, in the mops bacteria ranged from 500 to 1.9×10^5 CFU.m² on TSA and from 0 to 5.5×10^4 CFU.m² on VRBA, while fungi ranged from 1.0×10^3 to 1.2×10^4 CFU.m² on MEA and from 3.0×10^3 to 1.2×10^4 in DG18. Also, bacteria in cleaning cloths ranged from 5.0×10^2 to 5.4×10^5 CFU.m² on TSA and from 0 to 4.2×10^5 CFU.m² on VRBA, while fungi ranged from 3.0×10^3 to 1.2×10^4 on MEA and from 1.0×10^3 to 5.0×10^3 on DG18. The fungal contamination presented *Penicillium* as the predominant genera (Mops: 47.17% MEA, 45.16% DG18; Cleaning Cloths: 41.67% MEA, 59.43% DG18) as well as in the azole resistance screening (Mops: 67.69% SDA, 97.38% VOR, 38.89% POS; Cleaning Cloths: 83.57% VOR, 38.89% POS). *Aspergillus* section *Fumigati* was detected by qPCR (Mops: 50% samples (n=14); Cleaning Cloths: 60% samples (n=25).

Conclusions: The contamination found in mops and cleaning cloths suggest that cleaning procedures might being contaminating the surfaces. The presence of fungi non-susceptible to azole drugs and detection of toxigenic *Aspergillus* section *Fumigati* might represent a health risk and must be further investigated.

Effects of a psychomotor program developed in the COVID pandemic on risk factors for falls in nursing home older adults

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Keywords: Aging; falls prevention; institutionalization; risk of falling; therapeutic intervention

Objective: This study aimed to determine the effects of a psychomotor program performed during the COVID pandemic on risk factors for falls in nursing home older adults.

Methods: The study involved 10 nursing home older adults (aged 67–91 years old) who integrated two periods without intervention (control: pre-lockdown; and lockdown) and an experimental period (attending the program). Cognitive, emotional and physical functioning risk factors for falling were measured before and after each period.

Results: Friedman's Test followed by Pairwise Comparison post-test showed that the program induced significant improvements with an effect size (EF) ranging from large to small in the follow risk factors: fear of falling (EF=3.22), depressive states (EF=1.49), static balance (EF=0.83), lower strength (EF=0.76), upper strength (EF=0.73), cognitive status (EF=0.58), upper flexibility (0.52), perception of affordances – real (EF=0.51) and estimated (EF=0.45), agility and balance (EF=0.37), balance and mobility (EF=0.36), lower flexibility (EF=0.24) and

aerobic resistance (EF=0.21), (p<0.05). On the other hand, in the no-intervention periods, lower and upper strength, upper flexibility and perception of affordances – estimated significantly decreased (p<0.05).

Conclusions: Results from the study showed that the psychomotor program was effective in falls prevention by improving cognitive, emotional and physical functioning risk factors for falling. These findings suggest that for older adults' good quality of life, psychomotor programs should be implemented in nursing homes.

Psychological vulnerability in Portuguese and German adults during COVID-19 pandemics – a comparative study

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Keywords: COVID-19; mental health, well-being, psychological vulnerability, individual differences

Objective: To analyze comparatively the topics of quality of life (QL), and well-being (WB) in a population of German and Portuguese adults during the pandemics, in order to obtain a deeper understanding of the psychological vulnerability to crisis across countries and cultures.

Method: The defined dimensions of "trait anxiety", "feeling of threat", "difficulty to relax", "empathy & pro-social attitude", "health care", "sleep quality" and "optimism" were measured as predictors of QL and WB. A sample of 470 adults divided in three age groups – young adults (18–34 years), middle-aged adults (34–54 years) and old adults (55 years and older) — completed a self-report questionnaire assessing socio-demographic data, as well as quality of life and well-being during the pandemics period, through the above mentioned dimensions.

Results: Portuguese participants expressed higher empathy & pro-social attitude and health care, but in Germany participants reported higher quality of sleep. Young adults in both countries gave similar responses: a) they rated their quality of life lower than middle-age adults (mean difference=-4.83, SE=1.63, p < 0.01) and old adults (mean difference=-8.61, SE=2.04, p < 0.01), b) they showed also lower optimism than middle-age (mean difference=-1.02, SE = 0.35, p < 0.02) and old adults (mean difference=-1.51, SE = 0.34, p < 0.01), and c) they showed lower well-being than middle-age (mean difference=-2.37, SE = 0.81, p < 0.02).

Conclusions: Young adults rated their quality of life, optimism, and well-being during pandemics lower than middle-age and old adults, and experienced higher levels of trait anxiety and difficulty to relax.

It seems that young adults show a lower psychological adjustment than other age groups during COVID-19 crisis. It is concluded that quality of life, optimism, and well-being during the pandemics are affected differently according to country and group of age, suggesting individual differences in psychological vulnerability across cultures and ages, and consequently the need of specific interventions to cope with the pandemic's crisis.

Covid-19 Impact on the Health of Portuguese Teachers

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Keywords: Cognitive problems; exhaustion; musculoskeletal dysfunctions; professional well-being; voice disorders

Objective: The purpose of this study is to understand the impact of Covid-19 pandemic on the physical and mental health of Portuguese teachers.

Methods: The sample consists of 1779 Portuguese teachers (1423 female and 356 male); 58% (n=1029) over 50 years of age; 72.7% (n= 1293) with more than 21 years of service; and 48.1% (n= 856) teaching 3rd cycle/secondary school. We studied the distribution of responses for the variables: professional well-being, exhaustion, cognitive problems, musculoskeletal dysfunctions and voice disorders, and performed an analysis of variance (ANOVA), followed by *Bonferroni post-hoc* test (p<.05), according to gender, age, years of service and teaching level.

Results: 13.6% of the teachers reported feeling ill-being during the performance of their professional activity; 85.6% exhaustion; 74% musculoskeletal disorders; 68.9% cognitive problems; and 59.7% voice disorders.

The results according to gender, age, years of service show significant differences in all health dimensions (p<.05), except for teaching level for musculoskeletal disorders (F=.982, p=.427). In all health dimensions, the most significant differences occurred in the groups of teachers aged 20-21 years and 56-70 years; length of service between 0-5 years and those of more than 21 years; and the teaching level between 1st cycle and special education, with the exception of professional well-being where the greatest difference was reported between preschool and 3rd cycle/secondary teachers (95% CI].9076;4.6364[; p=.000).

Conclusions: The Covid-19 pandemic has worsened teachers' health status and professional well-being. The impact of these results on the quality of teaching should be the focus of future studies.

Protein intake and grip strength in community-dwelling older adults: analysis of individual participant data from four longitudinal cohorts

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Keywords: Handgrip strength; joint models; muscle strength; one-stage meta-analysis; PROMISS

Objective: Higher dietary protein, alone or in combination with physical activity (PA), may slow loss of age-related muscle strength in older adults but studies on this topic are lacking. We investigated the longitudinal relationship between protein intake and grip strength, and the interaction between protein intake and PA, using four longitudinal ageing cohorts in the PROMISS consortium.

Methods: Individual participant data from 5584 older adults and up to 8.5 years (mean: 2.5, SD: 2.4 years) of follow-up from the Health ABC, NuAge, LASA and Newcastle 85+ cohorts were pooled. Baseline protein intake was categorized into <0.8, 0.8 to <1.0, 1.0 to <1.2 and ≥1.2 g/kg adjusted body weight (aBW)/day (d). The prospective association between protein intake, its interaction with physical activity (cohort-specific tertiles), and grip strength (z-score) was determined using joint models (hierarchical linear mixed effects models and a link function for Cox proportional hazards models).

Results: Grip strength declined on average by 0.018 SD (95%CI: -0.026, -0.006) every year. No associations were found between protein intake and grip strength (sex and cohort-specific z-score) or rate of decline of grip strength in models adjusted for sociodemographic, anthropometric, lifestyle and health variables (e.g., protein intake ≥1.2 vs <0.8 g/kg aBW/d: β= -0.003, 95%CI: -0.014,0.005 SD per year). There also was no evidence of an interaction between protein intake and physical activity.

Conclusions: We found no evidence to support the hypothesis that higher protein intake (expressed as g/kg aBW/d), alone or in combination with higher PA, slows the rate of grip strength decline in older adults in this study.

Benefits of a fall prevention psychomotor program in dual-task cost and interference: two cognitive-motor paradigms

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Keywords: Aging; older adults; cognition

Objective: This study aimed to analyze the effect of a 12-week fall prevention psychomotor program in dual-task cost and interference of two different cognitive-motor paradigms.

Methods: Eighteen community-dwelling older adults (16 women; mean age: 74.1±5.3) were assigned to a psychomotor intervention program. Timed up and go test (TUG) [s] was assessed in single and dual-task (DT) conditions. Thus, DT measures included: a) TUG while counting backwards by one from 100 (DT-TUG-C); b) TUG whereas nominating as many animals as possible (DT-TUG-A). DT cost for both tasks was calculated as *((DT-TUG time - TUG time)/ TUG time) *100*, and the interference as calculated as *DT-TUG cognitive errors [n] + cognitive stops [n] + motor stops [n]*. Wilcoxon test comparisons were performed.

Results: Significant differences were found in both DT paradigms between the baseline and post-intervention in the variable *DT-TUG cognitive errors [n] + cognitive stops [n] + motor stops [n]*: DT-TUG-C decreased 56.5% (2.3±1.9 vs. 1.0±0.8, p=0.012), and the DT-TUG-A decreased 40.6% (3.2±1.6 vs. 1.9±1.6, p=0.008). The effect size [r] was medium in both DT-TUG-C (0.42) and DT-TUG-A (0.44).

Conclusions: Results suggest that the psychomotor program decreased the cognitive-motor interference on both DT paradigms by reducing errors and stops in DT performance. This is a relevant finding because DT ability impacts fall risk.

Harassment at work and its relationship with burnout in teachers

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Keywords: Burnout; harassment at work; quantitative; teachers

Objective: The present study aims at evaluating the prevalence of workplace bullying and its relation to burnout in Portuguese teachers.

Methods: The study was applied through a digital questionnaire consisting of a sociodemographic component and scales: Leymann Inventory of Psychological Terrorization (LIPT-60) and Maslach Burnout Inventory (MBI). The final sample obtained consists of 2003 Portuguese teachers.

Results: Most of the sample worked in public institutions (88.3%), were female (76.9%) and the average age was 47.73 years (SD=8.20). Regarding the level of education they worked on, 7.9% were teachers of pre-school education, 46.4% of elementary education, 28.2% of secondary education and 17.4% of higher education.It was found that more than half of the sample, that is, 54.5% had already heard about harassment at work/mobbing and 42% reported having observed harassment behaviours in co-workers. When filling out the LIPT-60, 75.1% of teachers reported having suffered at least one conduct of harassment. However, only 22.5% of the sample acknowledged being a victim of aggression. The most perceived aggression behaviours by the victims were: "criticize their work" (47.6%), "interrupt them when they speak" (43.6%) and "their superiors do not let him/her express or say what you have to say" (41.6%). All factors that constitute the LIPT-60 scale were positively correlated with the "exhaustion" and "depersonalization" dimension and negatively correlated with the "personal fulfilment" dimension of the MBI scale.

Conclusions: Only 1 in 5 teachers are aware of being victims of this phenomenon, and this result is related to the destruction of the victim's self-esteem, carried out by the aggressor. The most common aggression behaviours verified in the workplace were the blocking of communication and defamation, that is, acts that are carried out in order to denigrate the victim's image without leaving visible physical evidence. Teachers who experience an average rate of harassment at work have a higher value of exhaustion and depersonalization and a significantly lower value of personal achievement.

Animal foods and mobility limitations in community-dwelling young-old adults: longitudinal analysis of the EpiDoC cohort

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Keywords: ADL; food intake; function; older adults; protein.

Objective: Nutrition and especially protein play a role in optimally stimulating muscle protein synthesis and maintaining function. Animal foods are excellent sources of high-quality protein. Therefore, we aimed to determine the association between the frequency of animal foods consumption and mobility limitations in young-old adults.

Methods: The analytic sample was composed of 2860 community-dwelling adults aged 50 and over from a nationally representative longitudinal cohort of Portuguese adults who were followed up to 2.7 years. An animal food intake score was derived from the frequency of consumption of meat, fish and dairy products. Mobility limitations were defined as self-reported difficulty standing from a chair, walking, and climbing stairs. To determine the association between animal food intake and mobility limitations mixed effects logistic models were fitted.

Results: There were cross-sectional associations between quartiles of animal food intake and mobility limitations (for example, for walking outdoors Q4 v Q1: OR: 0.29; 95% CI: 0.15, 0.56) in unadjusted models, but no difference in the rate of change of mobility limitations over time in unadjusted models. These associations were no longer present when more complex models adjusted for sociodemographic, lifestyle and health variables were fitted. For example, participants in Q4 of animal food intake were not more or less likely to have difficulty climbing stairs than those in Q1 (OR: 0.95; 95%CI: 0.65, 1.38) nor have a different slope over time (OR: 0.86; 95%CI: 0.54, 1.37).

Conclusions: No convincing evidence was found to support an effect of animal foods intake on self-reported mobility limitations in this study.

Physical and motor fitness tests for older adults living in nursing homes: preliminary results of a systematic review

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Keywords: Assessment; autonomy; field tests; functional capacities; institutionalized

Objective: This review aimed to investigate which assessment methods are most used in the evaluation of the physical and motor fitness of older adults living in nursing homes.

Methods: Electronic databases were searched from January 2005 to December 2020. We used MeSh terms and relevant keywords (e.g., 'nursing homes', 'physical assessment', 'motor tests'). Data extracted from the selected studies included year of publication, type of study, age of population sampled, sample size, assessment tests (physical or motor), and abilities/skills that were measured. The review was registered in PROSPERO (CRD42020212338).

Results: Initially, 3971 articles were identified, of which 3616 were excluded based on title or because they were duplicates. Of the remaining 355, 94 were excluded based on title and abstracts. For the lasting 261 articles, the full text was analyzed. In this phase, 19 additional articles were excluded, resulting in a total of 242 articles (27939 people) to include in the review. According to the collected data, the most common assessments were the Handgrip Strength test (36.0% of the articles), the Timed Up and Go test (28.5%), the Short Physical Performance Battery (16.9%), the Berg Balance Scale (13.2%) and the Tinetti-test (13.2%).

Conclusions: This review allowed us to know which tests are most relevant when evaluating people living in nursing homes. This information may be relevant for health professionals working with these populations. It is noteworthy that the most evaluated capabilities in this population are balance, strength, and gait.

Executive functioning in patients with type 2 diabetes: preliminary results of a comparative study

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Keywords: Cognition, cognitive impairment, executive function, type 2 diabetes

Objective: Although executive functioning (EF) seems to be affected in people with Type 2 Diabetes Mellitus (T2DM), few studies used a comprehensive set of tests to strengthen this evidence and to help better scientific decision-making. Therefore, this study examined the differences in EF in patients with T2DM relative to a non-diabetic control group through a comprehensive set of cognitive tests focusing several executive functioning abilities.

Methods: A group of patients with T2DM (n=36, 65.9±6.8 years, diabetes duration of 16.5±10.1 years) and a control group without T2DM matched for age and mini mental state examination (n=26, 65.9±6.8 years) were enrolled in this study. All subjects completed a battery of neuropsychological tests for EF, assessed by the Stroop color and word test, phonemic and semantic verbal fluency test, and Trail-Making-Test, part B.

Results: Statistical analysis adjusting for age and education factors, showed that patients with T2DM performed worse than the control group on the Stroop-word (-9.59, [-17.54;-1.63], *p*=0.019), Stroop-color (-7.14, [-12.65,-1.64], *p*=0.012) and Stroop-word-color tasks (-5.16, [-9.96,-0.35], *p*=0.036), and on the semantic (-5.75, [-8.84;-2.66], *p*<0.001) and phonemic fluency tests (-5.84, [-11.43;-0.25], *p*=0.041). No significant difference was found across groups on the Trail-Making-Test (*p*=0.514).

Conclusions: The preliminary results show that patients with T2DM have worse EF compared to non-diabetic controls in most cognitive tests. Regular cognitive screening is an important preventive measure for people with T2DM, and should inform long-term prevention programs to tackle the negative impact of the disease in EF and other cognitive domains.

Post-fasting gender differences in fat mobilization during aerobic exercise

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Keywords: Energy; exercise; fasting; fat-burning; obesity

Objective: This study aims to analyze the fat oxidation through aerobic exercise in post night- and daytime-fasting states, comparing fat mobilization between genders.

Methods: A sample of 46 young adults (23 females and 23 males with 26.4±7.1 years and 26.4±5.2 years, respectively) fulfilled the inclusion criteria and voluntarily accepted to participate in this study. All participants were all evaluated twice within a 7 to 10 days frame. Body composition was accessed by Dual X-ray Absorptiometry. Participants underwent the Bruce treadmill test to determine VO_2max for aerobic exercise intensity control. After randomization, all participants performed two post-fasting aerobic exercise sessions, after an overnight fast and after a daytime fasting. The 24-hour diet prior to exercise was controlled for all the participants. Heart rate was measured objectively with the use of the Polar PE 3000 and metabolic intakes using the portable gas analyzer Cosmed K4b[2]®.

Results: No differences were found between the two protocols, either in fat oxidation (%) or in the amount of fat mobilized per day (g/day) (*p*= 0.71 and *p*= 0.76 respectively). Gender differences were found in the post night- and post daytime-fasting. In both conditions, males presented higher values of fat consumption (g/day) compared with women (*p*=0.00 in post night-fasting and *p*=0.01 in post daytime-fasting).

Conclusions: Fat oxidation through aerobic exercise doesn't differ between post night- and post daytime-fasting in similar fasting conditions. Nevertheless, men are more able to mobilize fats as a source of energy compared to women.

Physical activity and its associations with quality of life of female victims of domestic violence living in shelters

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Keywords: Accelerometry; domestic violence; health; women

Objective: Considering the impact of continued violence on general health, we aimed to assess the physical activity (PA) and quality of life of female victims of domestic violence (DV) living in shelters. Also, we aimed to search for associations between PA, quality of life and violence length among our sample.

Methods: Seventeen female victims participated in this study (mean age=43.9 ± 13.1 years). Participants were asked to use an accelerometer for seven days to assess PA and filled out the WHOQoL-Bref and the EuroQol – 5D to assess quality of life, as well as a brief survey assessing violence information.

Results: Fourteen (82%) participants met the accelerometer criteria (≥ 5 days per week). Six participants (42.9%) reached the recommendations of at least 150 minutes of moderate-intensity PA per week (M=172.5±136.3). Also, participants had, on average, 8.9 (±1.5) hours/day of sedentary behavior. Moderate-to-vigorous PA (MVPA) per week was positively correlated with the environment domain of WHOQoL (Spearman rho (SR)=.555, p=.040). Also, EuroQol scale was negatively correlated with total duration of violence (SR=-.603, p=.013), but positively correlated with total sedentary hours/day (SR=.639, p=.014). The length of time since violence ended correlated positively with the number of steps (SR=.803, p<.01).

Conclusions: Participants had low levels of PA. Physical activity, perceived quality of life and length of time with and without violence, were correlated among female victims of DV. Movement-based interventions should be promoted in victims' shelters as it could positively impact their physical activity behavior, quality of life and recovery process.

Participation and physical complaints in a sample of portuguese female artistic roller-skaters: A cross-sectional survey

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Keywords: Artistic roller-skating; frequency; injury; participation; physical complaints; questionnaire

Objective: Teaching and health professionals need to attain knowledge about the specific needs of artistic roller skaters when aiming to be effective in training and preventing physical complaints or injuries. Hence, the lack of epidemiological studies on artistic roller skaters validates the study to characterise athletes, participation habits and determine the frequency of physical complaints or injuries. Aim: to describe the athlete's body composition, participation habits and frequency of physical complaints in female artistic roller skaters within the last 12-months.

Methods: The study design was a cross-sectional online survey. A web-based survey was specifically developed to gather epidemiological details on female artistic roller skaters. The self-response questionnaire covered participant details, participation habits, injury history, and physical complaints within the last 12 months. Athletes were invited through official and informal communication channels devoted to artistic roller-skating.

Results: This study included 143 female artistic roller skaters. Sixty-seven (46.9%) athletes experienced 175 episodes (injuries or physical complaints) within the last 12-months, an average of 2.61 complaints per skater. Physical complaints mainly disturbed the lower limbs (53.1%), followed by the trunk (24.0%) and upper limbs (22.9%). The most common places were the knees (16,6%), back (10,9%) and wrists (10,3%).

Conclusions: Our findings suggest that artistic roller-skating physical complaints are frequent. Multiple episodes were common. Several factors were associated with physical complaints, including the number of coaches, changing frequency of boots, number of training hours per week, number of training hours before competition, and previous injuries.

The effect of a relaxation intervention on interoceptive awareness of college students' – preliminary results

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Keywords: Body awareness; body-oriented intervention; interoception; stress; higher education

Objective: The main purpose of this study was to examine the effect of a psychomotor relaxation program on college students' interoceptive awareness, an important foundation of social-emotional competence.

Methods: Twenty female college students (21.4 ± 2.3 years) were tested on two occasions, 4 weeks apart to establish a baseline measure (pretest 1 and pretest 2), and then engaged in an 8-week psychomotor relaxation program. Participants were tested again after the intervention program (post-test). The intervention program was comprised of two 20-minute sessions per week combining body awareness, muscle tone regulation, and breathing exercises. Interoceptive awareness was measured by the Multidimensional Assessment of Interoceptive Awareness (MAIA).

Results: Repeated measures ANOVA showed that MAIA scores changed significantly along the three assessments on two of the seven subscales: *noticing* ($F(1.9,36.1)=5.67$, $p=0.008$) and *emotional awareness* ($F(1.4,26.9)=5.53$, $p=0.017$). Post hoc analysis with a Bonferroni adjustment revealed that *noticing* improved from pretest 1 to post-test (25 %, $p=0.024$), and from pretest 2 to post-test (32 %, $p=0.025$). Regarding *emotional awareness*, significant improvements were found from pretest 2 to post-test (32 %, $p=0.005$). In both MAIA subscales, scores did not change significantly during the baseline period (from pretest 1 to pretest 2).

Conclusions: These results suggest that relaxation interventions are effective strategies for improving specific dimensions of interoceptive awareness in college students. Helping students understand their body and emotional states might be particularly important for college student's health and well-being.

Optimal time-window for performance enhancement in basketball college players

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Keywords: Warm-up; team sports; countermovement jump; linear sprint performance; salivary biomarkers; potentiate performance

Objective: Warm-up (WU) is a widely accepted strategy to potentiate performance. However, acute performance enhancement is highly dependent on individual characteristics, exercise mode, and time-window to the activity. This study aimed to investigate the effects of a 5- and 10-min passive rest after a basketball standard WU on physical performance and sympathetic stimulus associated salivary biomarkers.

Methods: Nineteen college basketball players participated in the study. The physical performance was assessed by countermovement jump capacity, 20m linear sprint and handgrip strength. The players were tested before WU (Pre-WU), 5 minutes after WU (Post-5') and 10 minutes after WU (Post-10'). Saliva was sampled collected at each moment and flux, α-amylase activity and protein content were evaluated. A repeated measures analysis was computed to identify the effect of the time-window on the considered variables, and Cohen's $d_{unbiased}$ as effect size was applied to identify pairwise differences

Results: The time-windows factor showed significant effects ($p<.001$) in countermovement jump, 20m sprint, and saliva markers. Pairwise differences were identified for Pre-WU vs Post-5' and Pre-WU vs Post-10' (with the small effect size for countermovement jump and moderate to large for both 20m sprint and biochemical markers). Trivial results were identified when compared Post-5' vs Post-10' in jumping capacity and biochemical markers and a small decrease in the 20m sprint.

Conclusions: Jumping and running performances were acutely enhanced after WU. An increase in α-amylase and protein accompanied these improvements. While jumping capacity was maintained during the entire time-window, the sprint ability declined from Post-5' to Post-10'. These results bring critical practical implications for post WU routines, highlighting the importance of manipulating time-windows to enhance specific performance outcomes.

Users and health professionals' perspectives regarding Portuguese primary care services: a focus on dementia

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Keywords: Career, communication, general practitioner, person with dementia, qualitative research

Objective: To deepen our understanding of how dementia care is delivered in Portuguese primary care services.

Methods: In this presentation, we jointly present three qualitative studies in primary care centers (Lisbon area), using purposive sampling. A quality framework for dementia care delivery guided the research. In the first two studies we conducted semi-structured separate interviews with primary care users (persons with dementia and their family careers) and staff (GPs, nurses, social workers). In the third study, we analysed live primary care consultations. The framework approach, the thematic analysis and data triangulation were components of the data analysis.

Results: The GPs responsibility to address different subjects in consultations seemed to condition their contribution to dementia management. Patients had limited access to dementia care because of undefined roles and poor coordination of health professionals, lack of social workers and inadequacy of community services. They displayed conspicuous difficulties in expressing themselves in consultations, more than would be expected from their level of dementia-related disability. Finally, careers' needs were poorly assessed.

Conclusions: Overall, Portuguese primary care teams need enhanced competence in dementia, nurse-led systematic care of users and families, improved strategies regarding careers' assessments and more extensive community support. Further analysis of triadic consultations may provide process measures for assessing the quality of clinical practice and consultation training: this aim is being pursued by our team in another, ongoing project. Our findings strongly suggest that Portuguese primary care teams are not yet prepared to comply with policy expectations regarding the management of dementia.

The person with dementia, the career and the doctor: triadic interactions in primary care

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Keywords: Alzheimer's disease, consultation, dementia, general practitioner, primary care

Objective: In what concerns dementia, medical encounters typically involve triads (a patient, a career and a physician). This is the case in many primary care consultations, where triadic dynamics have raised interest. Prior research suggest that physicians tend to focus on careers, not on patients, which may compromise the delivery of person-centered care in dementia. As the process should be better understood to optimize clinical outcomes, we aim to explore these triadic interactions in Portuguese primary care settings.

Methods: This study regards the ongoing project 'Dementia in Primary Care: the Patient, the Career and the Doctor in the Medical Encounter' (Bayer Investigation Grant | NOVAsaúde Ageing 2018). Five consultations with persons with dementia, their careers and GPs were thematically anlysed, using NVIVO®.

Results: The most frequent type of interaction was between GPs and careers. Disabling dementia communication patterns were patent in most consultations, seemingly contributing to the difficulties of persons with dementia in deciding about their own care. Careers often interrupted patients, speaking on their behalf, while GPs often downplayed the patients' concerns by colluding with careers.

Conclusions: In these consultations, both careers and GPs may have limited the expression of persons with dementia thoughts and wishes. Our findings align with first impressions that, despite some GPs' efforts, truly patient-centered approaches are limited in clinical scenarios. This is important, given the dearth of evidence from live-recorded primary care consultations. After conclusion of the consultations' analyses, results and practical recommendations will be discussed in focus groups of careers, staff and hopefully people with dementia. Despite significant delays due to the current pandemic, we look forward to completing this rewarding research.

Relationship between age and cardiac risk factors in Patients with Coronary Artery Disease

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Keywords: Aging; cardiovascular diseases; cardiovascular risk factors; coronary arteriosclerosis; prevention

Objective: To investigate the relationship between age and clinical characteristics, physical fitness, and in-hospital outcomes in middle-aged obstructive coronary artery disease (CAD) patients compared to older ones.

Methods: The present study sample included 43 patients with CAD who were admitted to the Hospital of Évora. Middle-aged patients were defined as those in the youngest quartile (40–60 years) compared to the older quartile (>60 years). Spearman correlation coefficient of ranks (ρ) was used to examine the association between the age groups and outcomes.

Results: Middle-aged patients compared to older patients showed a strong association with being smokers ($p < 0.05$), with lower Thyroid-stimulating hormone (TSH) levels ($p < 0.05$) and with greater cardiorespiratory fitness (487.5 ± 81.5 m vs. 415.8 ± 133.9 m, $p < 0.05$). Older patients showed a strong association with muscle fatigue ($p = 0.01$) and low muscle strength levels ($p = 0.02$). Low muscle strength levels were noted in the middle-aged population ($p = 0.03$), compared to reference values.

Conclusions: Our study has shown that the cardiovascular risk profile in middle-aged patients could be different from that presented by the older pairs. Clinical characteristics and performance measures should be considered when evaluating the risk for Cardiovascular Disease development of in a younger population.

Medical Care Is Frequent And Associated With Overuse Of Low-Value Care For Low Back Pain In Portugal: Results From A Population-Based Study

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Keywords: Low back pain; prevalence; diagnosis and management procedures; medical care

Objective: To estimate prevalence of medical care seeking, and to characterize and compare diagnostic workup and management procedures for Low Back Pain (LBP) between primary and secondary levels of care in the adult Portuguese population.

Methods: The present study was conducted under the scope of EpiReumaPt (2011-2013), a population-based study including a representative sample of Portuguese adults (n=10,661). Individuals with self-reported medical care history seeking for LBP within the previous 12 months (n=2,618) were considered. Patients' self-reported data collected was explored to characterize medical care seeking, and diagnostic and management procedures for LBP.

Results: A prevalence of medical care seeking for LBP of 38.0% (95%IC, 35.9-40.1%) was found. Primary care in isolation (45.3%), multiple care (primary plus secondary care) (28.8%) and secondary care in isolation (25.9%) were the sought levels of care for LBP. Several distinct structural-based diagnoses were diagnosed by physicians, mainly supported by laboratory and imaging tests performed to 91.1% of individuals. Disc herniation (20.4%) and osteoarthritis (19.7%) were the most frequent diagnosis, while x-rays (63.7%) were the most frequent diagnostic procedures. 75.1% of individuals self-reported being treated for LBP by their physician, 80.4% with oral medication/ pills and 15.3% with injectables. The mean duration of pharmacological treatment was 104.24 (266.80) days. The use of structural-based diagnosis, laboratory and imaging tests, and pharmacological treatment were generally aggravated when secondary care was considered (p<0.05).

Conclusions: Our results show that medical seeking for LBP is frequent and associated to overdiagnosis and overuse of pharmacological treatment.

Factors associated with clinical and radiographic severity in people with Osteoarthritis: a cross-sectional population-based study

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Keywords: Clinical severity; epidemiology; hip osteoarthritis; knee osteoarthritis; radiographic severity

Objective: To characterize the population with hip and/or knee osteoarthritis (OA) according to clinical severity profile, and identify sociodemographic, clinical and lifestyle factors associated with clinical and radiographic severity.

Methods: Participants with OA diagnosis from the EpiReumaPt study (2011–2013) were included (n=1087). Sociodemographic, clinical and lifestyle variables, were collected in a structured interview. Clinical severity was classified as the tertile distribution of HOOS/KOOS5 scores. Radiographic severity was defined with Kellgren-Lawrence Classification. These data were collected in a clinical appointment with a rheumatologist and were defined as the outcomes of this study. Factors associated with severity were identified using ordinal logistic regression models (p<0.05, 95%CI).

Results: People in the high HOOS/KOOS tertile tended to be older (64.39±0.70 years), female (75.2%), overweight (39.0%) or obese (45.9%) and had multimorbidity (86.1%). Factors significantly associated with higher clinical severity were age (55-64 years: OR=3.18; 65-74 years: OR=3.25; ≥75 years: OR=4.24), female sex (OR=1.60); multimorbidity (OR=1.75), being overweight (OR=2.01) or obese (OR=2.82) and having anxiety symptoms (OR=1.83). Years of education was inversely associated with higher clinical severity. Factors significantly associated with higher radiographic severity were age (65-74 years: OR=3.59; ≥75 years: OR=3.05) and being in the high HOOS/KOOS tertile (OR=4.91). Being a female and live in Lisbon or in the Centre region were inversely associated with the higher radiographic severity.

Conclusion: This study reinforces the need for effective preventive and management strategies to avoid OA progression in Portugal, namely programs for weight loss and multimorbidity.

Pharmacogenomic biomarkers as source of evidence to effectiveness and safety of antidepressant therapy

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Keywords: Antidepressants; biomarkers; depression; pharmacogenomic; pharmacotherapy

Objective: The main goal of this work was to identify, to describe, to characterize and to classify the scientific evidence associated with the use of pharmacogenomic biomarkers in the antidepressant treatment.

Methods: The work was developed in two phases: i) the search for pharmacogenomic biomarkers in summaries of antidepressant drugs with marketing authorization in Portugal; and ii) the undertaking of a systematic literature review (SLR) based on the data obtained in the first phase, with the principal objective of finding international literature that could describe and characterize the biomarkers found before and possibly identifying other relevant ones. Finally, the levels of evidence and recommendation grades were classified.

Results: After running the search queries, a total of 103 papers were obtained, 63 of which were included into SLR. Among the 26 drugs with marketing authorization in Portugal, only 16 had pharmacogenomic information. The pharmacogenomic biomarker identified more frequently was CYP2D6. These results were mostly supported by the SLR. It also revealed the existence of other relevant biomarkers. Most of the studies considered show a good level of evidence, which guarantees the reliability and good recommendation

grades. As for the database (built during phase i), the results were merely informative, resulting in no specific recommendations.

Conclusions: Most pharmacogenomic variants are not studied or acknowledged by the genetic tests and still need more scientific research that confirm their usefulness. Therefore, only a small number of variants is considered when prescribing antidepressant drugs. Besides, genotyping of patients is not common clinical practice.

Colorectal cancer: Opportunistic use of Computed Tomography for Bone Density and Abdominal Area assessment - Retrospective Cohort

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Keywords: Chemotherapy; gender disparity; observational study; osteoporosis; survivorship

Objective: To determine the effects of chemotherapy on bone mineral density (BMD) and abdominal area (AA), in patients with colorectal cancer. Determine the relationship between the two variables after chemotherapy.

Methodology: 50 patients of both genders underwent CT before chemotherapy and one year later. The variables BMD and AA were retrospectively evaluated using Computed Tomography. Multiplanar reformats were performed to place a circular region of interest (CRI) in the first lumbar vertebra, to measure BMD (HU) and AA (cm^2). Mean values of BMD and AA were compared before and after chemotherapy intervention. The relationship between BMD and AA after the intervention was assessed.

Results: There were differences in the effects of chemotherapy intervention on BMD and AA, before and after treatment in general and between sexes. For BMD and AA, women had lower mean values than men, before and after chemotherapy. In the pre-post chemotherapy comparison, BMD significantly decreased in women by about 16.6 HU (p=0.007) and AA increased in both sexes (women 52.7cm2, p=0.007 and men 41.3cm2, p=0.003). The treatment effect was greater for AA (EF=0.3) in the total sample and greater in women in both BMD and AA (EF=0.3 and EF=0.4, respectively). There was no relationship between the AA and post-intervention BMD.

Conclusion: Chemotherapy intervention has negative effects on BMD and AA, with different impacts considering gender. Women have more significant effects and greater magnitude of treatment effect. New studies are important to assess the progression and prognostic of BMD and AA over the colorectal neoplasm survival.

Monitoring the Effectiveness and Safety of HIV/AIDS Pharmacological Therapeutics Based on Pharmacogenomics Evidence

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Keywords: Antiretroviral, biomarkers, effectiveness, HIV/AIDS, pharmacogenomics, safety

Objective: The main goal of this work was to identify, to describe, to characterize and to classify the scientific evidence associated with the use of pharmacogenomics biomarkers in the HIV/AIDS treatment.

Methods: The project was divided into two parts: i) update of the database with pharmacogenomics biomarkers identified in summary of product characteristics (SPC) of antiretroviral drugs with authorization in Portugal; and ii) the elaboration of a systematic literature review (SLR), based on the data obtained from the first phase, which aimed to identify studies in the literature that identified and described the biomarkers found in SPC and other potentially relevant ones. Finally, the levels of evidence and recommendation grades were classified for every study.

Results: Most drugs with SPC in Portugal contained pharmacogenomic information. The most frequently identified biomarker in SPC was CYP3A (not specified), contrary to what is observed in the literature, where CYP2B6 was identified as the most prevalent biomarker. SLR also revealed the existence of other relevant biomarkers, especially in the case of tenofovir.

Conclusion: Most variants need some clinical investigation, and only a small number are considered when prescribing these drugs. Furthermore, genotyping is not a common practice, requiring greater incentives and investments in this area.

The changing public-private pattern of the Portuguese health system over the last decade

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Keywords: Public, private, Portuguese health system, evolution

Objective: The disinvestment in the public service since the Great Recession, coupled with management problems, may have changed the public-private mix of the Portuguese health system. The paper describes changes in the supply and demand public-private mix.

Methods: We used publicly available data from the National Statistics Institute (INE) and the National Health Interview Survey (NHIS). Data from INE measured changes in the supply and use of public and private health services, for the 2012-2019 period. We then modeled the probability of having private health insurance as function of the NHIS survey wave (2005/6, 2014, 2019), controlling for socioeconomic status (SES), self-reported health, age, and sex. We used logistic regressions and tested interactions between waves and SES.

Results: Over the 2012–2019 period, private hospitals increased by 1,534 beds, while public ones lost 1,276. The total number of consultations increased by 68.8% in the private sector and 9.8% in the public sector, while surgeries increased by 32.9% and 8.6%, respectively.

Between 2005 and 2019, we observed a statistically significant increase in private health insurance of 14.9 percentage points. The increase was significantly higher among those in the highest income quintile (+18.3pp) compared to those in the lowest income quintile (+13.4pp).

Conclusion: The weight of the private sector has substantially increased over the last decade, which may indicate a change in the nature of the Portuguese health system. This calls for action in regulation and financing of the private sector, to avoid breaches in the universality and equity principles.

The main concerns of adults living with Type 2 Diabetes Mellitus

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Keywords: Concerns about T2DM; individuals living with T2DM; person-centred care; qualitative study; type 2 diabetes mellitus

Objective: Understanding concerns of individuals living with type 2 diabetes mellitus (T2DM) on various aspects of life, essential to meet individual healthcare needs and develop a patient centric approach, is the main objective of multiphase CONCORDIA study. The CONCORDIA qualitative phase aimed to comprehensively identify the main concerns of individuals living with T2DM.

Methods: Five focus groups were conducted: two with HCPs and three with adults living with T2DM in different stages of disease. The study was implemented at the Portuguese Diabetes Patient Association, and an intentional sampling was used to maximize the differences within participants' characteristics. The participants were grouped according to: diagnosed ≥12 months ago without complications; diagnosed ≥12 months ago with minor complications; and with major complications. Data were analysed using thematic analysis.

Results: Forty-seven items of concerns (sub-themes) were identified and grouped into fourteen themes: (1)discrimination and stigma; (2)health-care; (3)other people's stories; (4)social context; (5)lifestyle; (6)professional context; (7)treatment; (8)disease management; (9) quality of life; (10)family context; (11)complications; (12)sources and quality of information; (13)monetary costs; and (14)mental health.

Conclusions: T2DM concerns are not limited to clinical aspects of the disease, and it's expected that each one has a different preponderance. Substantiated on this phase, a questionnaire was constructed to be applied in the further quantitative phase which will allow to measure the relevance on each "concern", from the HCP´s viewpoint and individuals living with T2DM, allowing group comparison.

The effects of a mind-body program on quality of life and health indicators of breast cancer survivors

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Keywords: Complementary therapies; oncology; psychomotricity; relaxation; survivorship

Objective: Breast cancer in women is associated with adverse effects that affect quality of life (QoL) and may persist after treatment. Although breast cancer survivorship has been significantly improved, many women still experience long-term distressing symptoms after the treatment phase. Body-mind interventions such as relaxation have been suggested as a complementary but important approach for breast cancer survivors. However only a few studies have yet assessed their efficacy on QoL and health indicators. The present pilot study examined the feasibility and the effects of a psychomotor relaxation program on breast cancer survivors' QoL and health indicators.

Methods: Women survivors of breast cancer were assigned to a psychomotor relaxation intervention (PRG;n=9) or a control group (CG;n=9). The PRG participated in an 8-week psychomotor relaxation program (two 50-min sessions per week) in the Oncology Department of a public hospital, and the CG maintained their usual routines. QoL was measured through the WHOQOL, and health indicators were obtained through the Short Form Health Survey-36 and salivary cortisol concentrations.

Results: The current study showed that the relaxation program was feasible and well tolerated by the participants. Compared to the CG, by the end of the program, the PRG showed better QoL and health indicators (role physical, general health, vitality, social functioning, role emotional, and mental health). In the fifteenth session, salivary cortisol concentrations significantly decreased from pre-session to post-session.

Conclusions: This study provided preliminary evidence that psychomotor relaxation is an effective therapeutic approach for improving QoL and health indicators of breast cancer survivors.

Absenteeism in the Portuguese National Health Service during the COVID-19 pandemic

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Keywords: Healthcare workforce; absenteeism; absenteeism management; COVID-19

Objective: The COVID-19 pandemic posed innumerous challenges to the Portuguese National Health Service (NHS), including the absence of essential workers for health organizations. Therefore, the present work intended to quantify the absenteeism among the NHS workers during the period of COVID-19 pandemic (2019–2020).

Methods: This work used data from the NHS Transparency Portal, regarding the number of healthcare professionals and the number of absence days in the period of analysis. Absenteeism was compared, before and during the pandemics, in absolute numbers and as a percentage of workforce working days. Additionally, this work analyzed the main reported absence categories.

Results: Results showed an 25% increase in absenteeism among NSH workers, from 2019 to 2020. The highest number of absence days were registered in May 2020, summing 598.323 days. Sickness, parental leaves and accident at work or an occupational disease were the most frequent absenteeism categories reported.

Conclusions: Several factors might explain the excess of absence days among the NSH workers, during the pandemics, but some of them are likely to be associated with COVI-19 infection, either directly or indirectly. These absent rates might lead to increased difficulties and constraints in healthcare organizations, threatening the adequate response to the pandemics.

Gender differences in depressive symptoms, socioeconomic status and perception of need of mental health services

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Keywords: Depression; gender; mental health services; Portugal; socioeconomic status

Objective: To identify depressive symptoms profiles among men and women and to understand their relationship with socioeconomic status and perception of mental health services use (MHS) need.

Methods: We used data from the 6th Portuguese National Health Survey, with 3,807 participants with mild, moderate or severe depression (Personal Health Questionnaire-8 ≥ 5). We used gender-stratified latent-class analysis to identify subtypes of depressive symptoms. We characterized each latent class by education and income, and perception of need of MHS.

Results: Latent classes among men were: "Mood and somatic symptoms" (50.6%), more present among those with secondary education; "Severe depression" (32.9%), more common among those low-educated or with higher education, and within the two poorest income quintiles; "Somatic symptoms" (16.5%), more frequent among the highest income quintile. Perception of need was lower for "Somatic symptoms" (8.1%), and higher for "Severe depression" (42.4%).

Latent classes among women were: "Mood and somatic symptoms with low self-esteem" (47.8%), more common among those low-educated; "Somatic symptoms", more present among those with secondary education; and "Severe depression" (26.9%), more common among those within the highest income quintile. Frequency of perception of need was 11.2% for "Somatic symptoms", 25.5% for "Mood and somatic symptoms with low self-esteem", and 43% for "Severe depression"

Conclusions: Presentations of depression seem to differ by gender and socioeconomic status. The need perception is generally low, even among those severely depressed, while gendered symptom profiles may impact MHS use. Understanding depression subtypes and their distribution across the population may help reducing the treatment gap.

Socioeconomic inequalities in needs perception and affordability concerns for depression treatment in Portugal

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Keywords: Depression; gender; mental health services; Portugal; socioeconomic status

Objective: To assess the link between socioeconomic status, needs perception for mental health services (MHS), and affordability, among persons with depressive symptoms.

Methods: Data from the 6th Portuguese National Health Survey (2019) were used. Among those with depressive symptoms (N=3,807; Personal Health Questionnaire-8 ≥ 5), we used gender-stratified logistic regressions to model perception of need for MHS and affordability concerns (unfulfilled MHS needs due to financial constraints), as a function of education and income quintile, adjusting for age groups, marital status, and severity of symptoms. Health insurance (private and subsystem) was used as mediation variable.

Results: Compared to low education, high-educated men lad lower perception of need (17.2%, OR=0.46, 95%CI=0.45-0.47) and high-educated women had higher (31.3%, OR=1.29, 95%CI= 1.27-1.31). Men in the first income quintile were more likely to recognize need (34.2%, OR=1.12, 95%CI=1.09-1.15). Among those with self-reported needs, affordability constraints were more likely among women with secondary (41.8%, OR=1.56, 95%CI=1.53-1.60) and men with higher education (61.9%, OR=18.3, 95%CI=17.3-19.4). Those in the poorest income quintile were more likely to report affordability concerns (66.5%, OR=18.7, 95%CI=17.6-19.8 among men; 51.5%, OR=5.77, 95%CI=5.57-5.97 among women). Adjusting for health insurance (private and subsystem), the disadvantage of low-income individuals decreased, as well as the disadvantage of high-educated men.

Conclusions: High-educated men seem more likely to report both low perceived need and affordability concerns. Low-income individuals' concerns about affordability question universal mental healthcare and may contribute to wider health inequalities. Differential access to health services seems to contribute to socio-economic inequalities in MHS use.

Contributing for the deployment of the European Public Health Information Portal in time of COVID-19

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Keywords: COVID-19; capacity building; health information; information portal; population health

Objective: The European Public Health Information Portal (PHIRI - Horizon 2020) aims at setting-up a research infrastructure to facilitate and generate the best available evidence for research on population health and well-being of populations as impacted by COVID-19. The Portal is a one-stop-shop, where Health Information (HI) Capacity Building is one of the services provided, to promote health information research and tackle HI inequalities between the Member States. The CHRC Team's work aims at contributing to the development of a catalogue of services on population health capacity building in health information and COVID-19.

Methods: Through a desk research and literature review, the activities were collected by three stages: 1) the search for the main HI institutions & organizations; 2) the activities shared by these sources on their official websites and 3) the detailed collection of information on each activity (description and technical information).

Results: A website on HI capacity building was developed, including 80 activities that have been identified, of which 24 (30%) were webinars, 17 (21%) courses and 10 (13%) asynchronous training activities. Regarding availability, 52 are activities with a fixed date, as opposed to 28 that are available permanently. The materials and courses found European materials and address different languages. They also focus on courses and materials about population health and non-pharmaceutical approaches to managing the COVID-19 pandemic - e.g., vaccination, lockdown plans, data analysis, etc. A European School on Health Information (ESHI) was established.

Conclusions: The activities developed reached some recommendations on the sustainability for the HI in Europe. The roadmap for sustainability on HI Capacity Building mainly addresses the identified HI needs across Europe, from which the ESHI has emerged.

Psychomotor relaxation in women with breast cancer - an individual intervention

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Keywords: Cancer; psychomotricity; quality of life; relaxation; therapeutic touch

Objective: Women with breast cancer experience a multitude of concerns that overwhelm their daily lives, affecting their quality of life. Psychomotor relaxation, due to its characteristics, may contribute to an improvement in quality of life, and may be a softening response to the effects associated with breast cancer treatment. To examine effects of relaxation mediated by therapeutic touch on quality of life, and health indicators (pain, anxiety and cortisol concentrations) of women with breast cancer undergoing treatment

Methods: 23 adult women with breast cancer participated, ten in control group (CG) and thirteen in experimental group (EG). The EG experienced an individual intervention of relaxation mediated by touch twice a week for eight weeks (40 minutes each session). The EC maintained usual routines. An evaluation of quality of life and health indicators was performed before and after the intervention. Quality of life was assessed through EORTC-QLQ C30, and health indicators with Pain Quality Assessment Scale, Hospital Anxiety and Depression Scale, and cortisol concentrations.

Results: At the end of the program, the EG verified significant improvements, in the decrease in Fatigue (p=.039) and in perspective of Health and Quality of Life (p= .020), and in the decrease in cortisol concentrations (p=.046). There were significant differences in the Perception of Quality of Life (p=0.020) between groups (EG and CG) at the post-intervention moment. It was improved in EG and worsened in CG.

Conclusions: The results suggest that relaxation using therapeutic touch may be a beneficial therapeutic approach for the breast cancer treatment phase.

Pharmacovigilance Teaching-Learning: a direct and indirect cross-sectional analysis in Portugal

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Keywords: Adverse drug reactions; health professionals; higher education (health); medication safety; pharmacovigilance; risk management; spontaneous notification

Objective: Describe and characterize the teaching-learning process of pharmacovigilance in Portugal. To do so, it is necessary to analyze the knowledge, perceptions, and postures of students and health professionals, as well as the main difficulties that had been identified by the professionals regarding spontaneous notification.

Methods: It used a mixed analysis method, composed of a direct analysis (with the spread of an online questionnaire on social media based on a non-probabilistic technique, as a convenience, referred to as snowball and also via e-mail to several institutional contacts and student's nucleus); and by indirect analysis (through an explicit revision of the curricular plan in the health degrees by keywords searching in the course plans).

Results: From a total of 650 participants, 403 (62%) were students and 247 (38%) were professionals. About 84.4% of the students and 54.7% of the professionals affirmed they had never done an adverse drug reaction spontaneous notification. Only 24.6% of the students and 17.8% of professionals refer the existence of specific course contents reserved for pharmacovigilance in their degrees. Most students and professionals who answered the questionnaire showed interest on the integration of pharmacovigilance in the academic curriculum of the healthcare courses and in the on-going training plans of the health professionals. In addition, the majority totally agreed that pharmacovigilance adds value to its practical application in a professional context and claims to feel more motivated to report suspected adverse reactions, if taught. Analyzing 93 course plans, only 3 referred to as mandatory pharmacovigilance curricular units and 39 do not address any key-terms.

Conclusions: Since there are few institutions teaching programmatic contents regarding the pharmacovigilance in the different healthcare courses and given the questionnaire results, it's evident the need for a wider reflection regarding the further training and constant update of the practicing professionals as well as in the diverse health institutions, investing in the creation of an academic curriculum that integrates pharmacovigilance in healthcare courses.

MiniVent: A low-cost pressure-controlled ventilator system for emergency use

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Keywords: COVID-19, mechanical ventilator, open-source, PC-CMV, rapidly manufactured

Objective: To address the issue of ventilator shortages due to the COVID-19 pandemic, our group developed the proof-of-concept of a low-cost and rapidly scalable open-source mechanical ventilator system for emergency use.

Methods: A simplified architecture of MiniVent was designed to meet the low-cost and easy-to-produce pre-established properties of our device. To carry out such an approach, we decided to use only components commonly available in the market or components of easy production with usual manufacturing techniques, such as 3D printing. The design of MiniVent comprises a pneumatic unit that controls the quality of the air and oxygen mixture and maintains the pressure on the patient's lungs at the desired preset value, along the respiratory cycle. The control unit was programmed on a microcontroller and is responsible for ensuring the respiratory rate and the inspiratory-expiratory ratio, selected by the user. To ensure the fulfilment of all the security and specification requirements of pandemic ventilators, we followed the mandatory specifications presented in the document - Rapidly Manufactured Ventilator System (RMVS) - published by the Medicines & Healthcare products Regulatory Agency (MHRA). A set of tests was performed using different ventilatory parameters for instrumental verification of MiniVent's physical and biological performance. A stability test was also carried out during 35 hours of uninterrupted operation to analyse whether the expected dynamics of the output pressure were maintained over this time.

Results: The ventilator system developed allows prescribing different breathing rates, fractions inspired of oxygen (FiO_2), inspiratory-expiratory ratios (I: E), positive inspiratory pressures (PIP) and positive end-expiratory pressures (PEEP), which can be easily adjustable to the patient's condition.

The results of a set of tests assured the reliability of all the ventilatory parameters set by the user. Furthermore, MiniVent showed

a good performance over 35 hours of uninterrupted operation, which pointed out the stability of this device. In addition, the device was tested in a porcine model showing good mechanical performance and adequate arterial blood gas throughout all test periods. When compared with commercial ventilators, MiniVent exhibited a similar performance of ventilation.

Conclusions: MiniVent could be a reliable solution to overcome the shortage of commercial ventilators in emergencies, such as the recent COVID-19 pandemic. This device presents a production cost of under 1000€ and does not need specialized technical assistance so it might be a viable solution even in lower-income countries.

Mobile technologies to support healthcare provider to healthcare provider communication and management of care

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Keywords: mHealth; systematic review; telehealth; telemedicine
Objective: Mobile technologies can potentially expand the use of telemedicine to facilitate communication between providers. We aimed to assess the effects of mobile technologies versus usual care for supporting communication and consultations between healthcare providers on performance, acceptability and satisfaction, healthcare use, patient health outcomes, acceptability and satisfaction, costs, and technical difficulties.

Methods: We followed the Cochrane and EPOC methodological procedures. We searched for randomised trials at CENTRAL, MEDLINE and four other databases from January 2000 to July 2019. We searched clinical trials registries, references of relevant systematic reviews and contacted topic experts.

Results: We found 19 relevant studies (more than 5766 people) who needed health care. Sixteen studies were from high-income countries. When primary healthcare workers use mobile technologies to consult with hospital specialists, they may increase the likelihood of retinopathy screening for people with diabetes, or receiving an ultrasound if referred with symptoms, and may reduce referrals or a visit to the clinic for people with a skin condition or referred for clinic follow-up for different health problems. When emergency doctors use mobile technologies to consult with hospital specialists, patients are probably managed slightly more quickly.

Conclusions: Interventions may reduce the time between presentation and management of the health condition when primary care providers or emergency physicians use them to consult with specialists, and may increase the likelihood of receiving a clinical examination among participants with diabetes and those who required an ultrasound. There was little evidence of effects on participants' health status and well-being, satisfaction, or costs.

Non-linearity in 3rd graders handwriting copy task: a pilot study

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Keywords: Fractal dimension; approximated entropy; variability; children
Objective: The complex organization of handwriting variability, or fractal dynamics, theoretically represents the adaptive capacity of the locomotor hand/arm system to be precisely controlled. Fractal dynamics are sensitive to various individual constraints and task constraints. The temporal organization of these sequences of movements has a complex fractal-like structure characterized by self-similarity over multiple time scales. The purpose of this study was to investigate: 1) variability's structure of a handwriting copy task (c1) and its repetition after a 5-minute of copy (c2); 2) variability between the 5 first lines of c1.

Methods: 28 children aged 7-8 years (16 female, 12 male) performed a 5-minute copy from the Concise Evaluation Scale for Children's Handwriting (BHK) on a digitizing table and repeated the first five lines. Movements were recorded using an x-y digitizing tablet with an inking pen and MovAlyzeR®. Nonlinear dynamic parameter approximate entropy (ApEn) was used to assess pattern of the regularity of respective kinematic time series, and we used the detrended fluctuation analysis (DFA) method to characterize the fractal dynamics of handwriting.

Results: We found significant differences using t-tests in the regularity between c1 and c2 of global handwriting in the horizontal component and in the vertical component. Between lines differences were found in both components in lines #2, #4 and #5.

Conclusions: Five minutes of handwriting does not appear to affect fractal dynamics. The variability between lines appears to be more sensitive to ApEn. Nonlinear methods are an important tool to quantify changes in task graphomotor behavior.

Mobile applications for quick adverse drug reaction report: a scoping review

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Keywords: Adverse drug reactions; mobile apps; pharmacovigilance; Portugal; spontaneous notification; underreporting
Objective: This study aims to identify existing mobile applications for adverse drug reaction (ADR) reporting. Hence, the subsequent questions were made through the process: What are the

implemented mobile apps for adverse drug report? Where are they used? Are they contributing to minimize the sub notification issue?

Methods: A scoping review methodology was selected. Joanna Brigg Institute guidelines (2015) were considered and the framework proposed by Arksey and O'Malley (2005) was followed.

Results: A total of 91 studies were identified. After duplicate removal, 84 were screened based on title and abstract, of which 19 remained for full-text review. A final number of five articles were included in this systematic scoping review, revealing five implemented mobile apps for ADR report. The articles were published in 2012 (n=1), 2017 (n=1), 2018 (n=1), and 2019 (n=2).

The five mobile apps identified were: 1 - MedWatcher (EUA,2012); 2 - VigiBIP (France,2015); 3 - WEB Recognising Adverse Drug Reactions (WEB-RADR) project (2014), and within this project, country-specific mobile apps - United Kingdom (Yellow Card,2015), Netherlands (Bijwerking,2016) and Croatia; 4 - Med Safety, a generic version of the WEB-RADR app, (Burkina Faso,2017) resulting from a collaboration between several institutions including WHO; 5 - ADR PvPi app (India,2017).

Conclusions: In an increasingly technological world, several countries have developed mobile apps for quick ADR reports. This type of official mobile app still does not exist in Portugal. It is essential to reflect on its national development, to increase the notification rate, which remains low.

Is it possible to calculate lumbar load and lordosis with Dual-energy X-ray absorptiometry? Case Study

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Keywords: Biomechanics; muscle activity; radiology; strength; vertebral body

Objectives: Calculate lordosis and lumbar load using DXA (dual energy X-ray absorptiometry) compared to conventional X-ray in trunk flexion and assess which muscle activation is most recruited in trunk flexion/extension movement.

Methodology: The study included a woman with no history of lumbar pathology. An image of the trunk flexion in lateral decubitus was performed at two different angles (0º and 45º), starting from the neutral position (0º) through DXA, conventional X-ray (XR). For each technique (DXA and XR), we analyse two different profiles. Stress on the 3rd lumbar vertebral body (L3) was assessed as: Stress (N/cm^2) = (0.455 PC/CSA) (cos 45°+ 0.186 H sin50°/d. Trunk muscle activity was measured, in lateral decubitus with slight knee flexion (trunk at 0º), trunk at 45º and return to the initial position. We recorded four trunk muscles' surface electromyography (SEMG) activity: spinal erector, iliocostal spinal erector, multifidus, and rectus abdominis.

Results: Stress (0º) XR=1.33 N/cm^2, Stress (0º) DXA=1.31 N/cm^2; Stress (45º) XR=14.32 N/cm^2 and Stress (45º) DXA=14.29 N/cm^2. Physiological lumbar lordosis (θ) was θ XR= 40º and θ DXA= 48º. The rectus abdominis showed greater activity during trunk flexion and the multifidus muscle during trunk extension.

Conclusion: Further studies to calculate the load and lumbar lordosis with DXA are needed to assess its reliability and reproducibility. It is essential to develop intervention programs that prepare for the impact of daily loads on the lumbar spine to prevent osteoporotic fractures, back-pain and herniated discs.

Effects of a Sensorimotor Pilates based program on gait control

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Keywords: Fractal; gait; metronome; sensorimotor; variability

Objective: The complex organization or the fractal dynamics of gait variability represents the adaptive capacity of the locomotor system and is sensitive to task constraints, as walking to an auditory stimulus (metronome). The fractal analysis of stride interval time series can be used as a marker for gait adaptability, gait disorder and individual fall-risk assessments. The purpose of the study was to evaluate the impact of specific sensorimotor exercises, based on the *Pilates* method (PSM), on the complexity of gait dynamics.

Methods: Sixteen adults are regular exercisers of *Pilates Method* (rPM) and regular *Pilates Method* with a specific sensorimotor exercise program (rPSM). The participants were asked to walk twelve minutes using an Inertial Measurement Unit at an auditory stimulus (metronome) based on their self-pace. The detrended fluctuation analysis (DFA) method was used to characterize the fractal dynamics - α1 and sample entropy to assess the pattern of the regularity of stride interval time series - The data was compared with ANCOVA statistical test.

Results: There was a significant effect of PSM on the fractal scaling exponent of the stride interval time series (F [1,2] = 4.55, p = 0.011], with an effect size w^2 = 0.282, but no significant difference in sample entropy.

Conclusions: The rPM group increased their fractal scaling, suggesting that walking with constraint is more challenging and complex for their locomotor system, i.e., altering the temporal structure of walking. This observed that sensorimotor exercise program with *Pilates Method* can increase adaptive capacity of the locomotor system to a task constraint.

A multimodal exercise program plus brain games apps has effects in fine motricity and hand strength of older adults in long-term care facilities

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Keywords: Brain-training apps; nursing homes; multimodal program; elderly

Objective: This study aimed to investigate the effects of a multimodal intervention that includes physical exercise and brain-training apps (on tablets) on upper limbs muscle strength and fine motricity of older adults in long term care facilities.

Methods: Thirteen older adults (86.3±3.6 years) living in long-term facilities participated in this study. The participants were first evaluated on two occasions (pretest1 and 2) one month apart to establish a baseline/control period and were re-evaluated 6 weeks after the intervention (post-test). The intervention was conducted 4 times a week, 60 minutes per session, for 6 weeks; during this period, multimodal physical exercises on two days, and exercises in tablet on another two days, were interspersed. Arm strength was assessed by the arm curl test; handgrip strength of the dominant and non-dominant hand was assessed by hand dynamometer; fine motricity for dominant, non-dominant hand and both hands was accessed by the purdue pegboard test.

Results: Repeated measures ANOVA showed that the intervention influenced fine motricity of the dominant hand ($F(1.9,21.2)=11.6$, $p<0.001$) and handgrip strength of the dominant hand ($F(1.9,21.1)=6.7$, $p=0.006$). Bonferroni post hoc tests showed that fine motricity and handgrip strength decreased from pretest1 to pretest2 in -14.3% ($p=0.009$) and -7.9%, ($p=0.014$), respectively. Both fine motricity (20.8%, $p=0.005$) and handgrip strength (8.6%, $p=0.034$) improved from pretest2 to post-test.

Conclusions: The results demonstrate that a multimodal intervention has benefits in fine motricity and in the strength of the dominant hand. These variables are very important for the activities of daily living of elderly people, allowing them to perform tasks essential to their autonomy.

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Cytotoxicity of contaminated protection devices used in waste sorting industry

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Keywords: A549 cells; cytotoxicity; hep G2 cells; mechanic protection devices; MTT formazan; respiratory protective devices

Objective: This study evaluated the cytotoxicity of contaminants present in protection devices used at work in a waste sorting industry.

Methods: One waste sorting industry in Lisbon was selected for the collection of filtering Respiratory Protection Devices (RPD) (n=118) and mechanic protection gloves (MPG) (n=67) used by workers. The MTT formazan assay was used to determine cell viability of different cells exposed to contaminated RPD (interior layer (IL) and exhalation valves (EV)) and MPG. Human epithelial lung (A549) and swine kidney (SK) cells were exposed to test dilutions of RPD; SK and hepatocellular carcinoma (Hep G2) cells were exposed to test dilutions of MPG.

Results: Half-maximal inhibitory concentration (IC50) in lung cells was lower for RPD-IL than RPD-EV, with IL exhibiting higher overall cytotoxicity than exhalation valves ($z = -4.455$, $p = 0.000$). High cytotoxicity (IC50 < 0.05 mm^2/ml) was observed in HepG2 cells for 18 out of 57 MPG.

Conclusions: Contaminated RPD exhibited moderate cytotoxicity on epithelial lung cells, whereas contaminated MPG exhibited high cytotoxicity on hepatic cells. The effects on workers' health resulting from exposure to contaminants present in the waste sorting industry, either by inhalation or ingestion route must be further investigated.

Occupational and Environmental Health: Research that provides scientific data to support policy action

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Keywords: Environmental health; occupational health; research; science to policy interface

Objective: The dynamic interaction between science and policy is fundamental to progress in populations' health and wellbeing. Environmental and Occupational Health sciences are especially important to this progress through dedicated policies and by a circular process: new science should imply new policy, better practices and new questions.

Methods: A first survey of the projects developed since 2016 was performed. Background information from each project was collected to identify the aims, the foreseen outputs and which policy action/regulatory framework the project could support.

Results: Ten research projects were identified and all provide scientific inputs that can be translated into policy action in different areas such as: (i) environmental health (chemical exposures and respective drivers and actions to be taken to reduce exposure; establishing the evidence base for reducing the risks and burden of disease from chemical exposure including workplace risk factors exposure, and health impact assessment of priority chemicals; climate change implications on public health and actions needed to adapt to different patterns of chemical exposures) and (ii) occupational health (new exposure limits, criteria for defining new workplaces working conditions, and to implement new risk management measures, particularly in the context of the pandemic situation).

Conclusions: The major conclusion from this analysis is the need for a straight connection between researchers and policy actors, implying that research data should be adequately translated to be easily used by the policy actors and that further work is needed to strengthen the science to policy interface.

Exposure to several risk factors in the e-waste management industry

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Keywords: Occupational health; environmental health; research; e-waste management; chemicals; WRMSDs

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 such as metals, flame-retardants and phthalates. Additionally, recycling is a repetitive and musculoskeletal demanding activity for e-waste workers. Work-related musculoskeletal disorders (WRMSDs) may impair the health and the quality of life of many workers, being a burden in e-waste occupational settings. WRMSDs prevention programs are mandatories in the large companies that are doing e-waste management. The present study aims to identify potential hazards and improve the protection of the

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worker's health from the risk of exposure to chemical substances and the development of WRMSDs.

Methods: Under the project HBM4EU, a cross-sectional study is being developed in e-waste management companies in nine European countries, including Portugal, that will imply the collection of biological samples (urine, blood, hair), industrial hygiene samples (settled dust, air samples and wrist/wipe samples), and the application of questionnaires (sociodemographic, working conditions).

Results: Data will be analyzed and integrated to characterize the risk associated with exposure to chemicals and the risk of developing WRMSDs.

Conclusions: Altogether, these data will contribute for the implementation of risk management measures intending to decrease the burden associated with the exposure to chemicals and the development of WRMSDs in this occupational setting.

The relationship between Obesity, Hospitalization and Health-care Costs in Portugal: Preliminary Results

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Keywords: Obesity, hospitalization, healthcare costs

Objective: The objective of this study was to evaluate the association between obesity and hospitalization and their respective costs.

Methods: A cross-sectional study at the baseline of the Chronic Disease Epidemiology Cohort (EpiDoC Cohort). Hospitalization was treated as a binary variable (yes/no) and categorized according to the Homogeneous Diagnostic Group (GDH). We collected Body Mass Index through the self-reported height and weight and categorized according to the World Health Organization (WHO) classification in four categories: underweight <18.5kg/m^2, normal weigh =18.5 to 24.9kg/m^2, pre-obese =25 to 29.9kg/m^2 and obese $\geq$ 30kg/m^2. For the purpose of this study, we use only obesity as binary variable. The costs per event were estimated using the average price of the severity levels of each identified GDH. The total cost was obtained through the product of the average price of each hospitalization episode and its frequency of occurrence. Logistic regression was used to examine associations between obesity and hospitalizations. All analyzes were performed using STATA version 15, considering a significance level of 5%.

Results: 10,661 individuals were included, 20.6% of whom were obese. Only 9% were hospitalized, of which 2.3% were obese, 66% were women and the mean age of was 57 years. Diseases of musculoskeletal, digestive, and circulatory systems were the main causes of hospitalization. Individuals with obesity had a 22% (95% CI = 21,9%–27,6%) (p-value=0.02) higher risk for hospitalization than did those without obesity. The total cost of hospitalizations was EUR 4 million. The hospitalizations cost per person was 13% higher among obese individuals, 5,156 euros (± 203) per person-year than non-obese individuals, 4,846 euros (± 133) per person-year.

Conclusions: Obesity was associated with higher hospitalization and increases the costs of this outcome in the Portuguese population being so an important indicator to predict the scenario for the country's health system.

The effects of whole-body vibration on the management of osteoporosis in early menopausal women

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Keywords: Early menopause, osteoporosis, whole body vibration, BMD

Objective: The objective of this study is to examine the effects of whole-Body Vibration (WBV) on bone mineral density (BMD) and bone turnover markers in women diagnosed with early menopause as a means for reducing the risk of developing osteoporosis and subsequent increased fragility fracture later in life. To the best our knowledge this is the first study to examine WBV in early menopausal women who reach menopause before the age of 45.

Methods: A minimum of 30 early menopausal women (>40–<45 years old, GROUP 1), and 60 normal postmenopausal women (> 51 years old, GROUP 2) will be recruited from the Menopause clinic of Maternidade Dr. Alfredo da Costa and rheumatology consultation at Hospital Santo Antonio dos Capuchos in Lisbon. In each group, half the participants will be randomly assigned to the WBV group, and the other half will be assigned to the control- group (step @ home). In this way, out study satisfies the randomized control trial (RCT) conditions.

Results: Biochemical analysis of bone turnover markers, namely Osteocalcim and Osteopontin, which are known for their role in the bioregulation of the bone mineral phase, as well as BMD measurements will be performed at baseline, 4 and 8 months for both groups.

Conclusions: The project aims to study strategies for improving BMD and modify fall-related factors by increasing balance and muscle strength in women with early menopause diagnosis, who are considered at a higher risk of developing osteoporosis and increased fragility fracture later on in life than normal menopausal women.

Assessment of Psychosocial Risk Factors in Nurses one year after the start of the COVID-19 pandemic

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Keywords: COVID-19; nursing; psychosocial factors; risks; well-being

Objective: To assess psychosocial risk factors in Portuguese nurses one year after the pandemic.

Methods: A questionnaire in digital format consisting of a sociodemographic and professional component and the COPSOQ II scale was applied, which assesses the psychosocial risks that influence health and well-being. The total sample is 188 nurses.

Results: All nurses reported that the COVID-19 situation increased psychosocial risk factors at work level, with an average intensity of 8.54 (scale 0-10). In fact, 91.5% said that life will never be like it was before the pandemic. The factors that showed the greatest impact on health and well-being were cognitive demands (M=4.13) emotional (M=3.95), meaning of work (M=3.93) and high work rate (M=3.86). In the mean values of the COPSOQ II scale, there were no significant differences regarding gender (Pillai's trace=0.206, $F_{(35.152)}$=1.129, p=0.167. Age was significantly correlated with cognitive requirements factors (r=0.165; p=0.024), influence at work (r=0.248; p=0.001), social support from superiors (r=0.150; p=0.040), quality of leadership and headship (r=0.175; p=0.016), justice and respect (r=0.144; p=0.048), commitment to the workplace (r=0.202; p=0.005), job satisfaction in general (r=0.224; p=0.002) and sleep problems (r=0.168; p=0.021).

Conclusions: One year after the start of the pandemic, nurses feel physically and emotionally exhausted due to the high work rate and not very optimistic about the improvement of the situation. The older the age, the more positive is the perception of influence at work, social support from superiors, quality of leadership and headship, justice and respect, commitment to the workplace and job satisfaction.

Microbiologic contamination present in mops and cloths used for cleaning procedures in firefighters' headquarters

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Keywords: Azole resistance; *aspergillus* sp.; *aspergillus* section *Fumigati*; qPCR

Objective: The study aimed to characterize the microbial contamination (bacteria and fungi focusing on *Aspergillus* section *Fumigati*) through passive sampling methods (14 mops and 25 cleaning cloths) in 11 firefighters' headquarters of Lisbon.

Methods: Viable bioburden through culture-based methods and azole resistance profile (following the protocol adapted from the EUCAST 2018) were obtained. Molecular tools were used for detection of *Aspergillus* sections, namely *Aspergillus* sections *Fumigati* and *Nidulantes*.

Results: Regarding to microbial contamination, in the mops bacteria ranged from 500 to 1.9×10^5 CFU.m² on TSA and from 0 to 5.5×10^4 CFU.m² on VRBA, while fungi ranged from 1.0×10^3 to 1.2×10^4 CFU.m² on MEA and from 3.0×10^3 to 1.2×10^4 in DG18. Also, bacteria in cleaning cloths ranged from 5.0×10^2 to 5.4×10^5 CFU.m² on TSA and from 0 to 4.2×10^5 CFU.m² on VRBA, while fungi ranged from 3.0×10^3 to 1.2×10^4 on MEA and from 1.0×10^3 to 5.0×10^3 on DG18. The fungal contamination presented *Penicillium* as the predominant genera (Mops: 47.17% MEA, 45.16% DG18; Cleaning Cloths: 41.67% MEA, 59.43% DG18) as well as in the azole resistance screening (Mops: 67.69% SDA, 97.38% VOR, 38.89% POS; Cleaning Cloths: 83.57% VOR, 38.89% POS). *Aspergillus* section *Fumigati* was detected by qPCR (Mops: 50% samples (n=14); Cleaning Cloths: 60% samples (n=25).

Conclusions: The contamination found in mops and cleaning cloths suggest that cleaning procedures might being contaminating the surfaces. The presence of fungi non-susceptible to azole drugs and detection of toxigenic *Aspergillus* section *Fumigati* might represent a health risk and must be further investigated.

Effects of a psychomotor program developed in the COVID pandemic on risk factors for falls in nursing home older adults

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Keywords: Aging; falls prevention; institutionalization; risk of falling; therapeutic intervention

Objective: This study aimed to determine the effects of a psychomotor program performed during the COVID pandemic on risk factors for falls in nursing home older adults.

Methods: The study involved 10 nursing home older adults (aged 67–91 years old) who integrated two periods without intervention (control: pre-lockdown; and lockdown) and an experimental period (attending the program). Cognitive, emotional and physical functioning risk factors for falling were measured before and after each period.

Results: Friedman's Test followed by Pairwise Comparison post-test showed that the program induced significant improvements with an effect size (EF) ranging from large to small in the follow risk factors: fear of falling (EF=3.22), depressive states (EF=1.49), static balance (EF=0.83), lower strength (EF=0.76), upper strength (EF=0.73), cognitive status (EF=0.58), upper flexibility (0.52), perception of affordances – real (EF=0.51) and estimated (EF=0.45), agility and balance (EF=0.37), balance and mobility (EF=0.36), lower flexibility (EF=0.24) and

aerobic resistance (EF=0.21), (p<0.05). On the other hand, in the no-intervention periods, lower and upper strength, upper flexibility and perception of affordances – estimated significantly decreased (p<0.05).

Conclusions: Results from the study showed that the psychomotor program was effective in falls prevention by improving cognitive, emotional and physical functioning risk factors for falling. These findings suggest that for older adults' good quality of life, psychomotor programs should be implemented in nursing homes.

Psychological vulnerability in Portuguese and German adults during COVID-19 pandemics – a comparative study

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Keywords: COVID-19; mental health, well-being, psychological vulnerability, individual differences

Objective: To analyze comparatively the topics of quality of life (QL), and well-being (WB) in a population of German and Portuguese adults during the pandemics, in order to obtain a deeper understanding of the psychological vulnerability to crisis across countries and cultures.

Method: The defined dimensions of "trait anxiety", "feeling of threat", "difficulty to relax", "empathy & pro-social attitude", "health care", "sleep quality" and "optimism" were measured as predictors of QL and WB. A sample of 470 adults divided in three age groups – young adults (18–34 years), middle-aged adults (34–54 years) and old adults (55 years and older) — completed a self-report questionnaire assessing socio-demographic data, as well as quality of life and well-being during the pandemics period, through the above mentioned dimensions.

Results: Portuguese participants expressed higher empathy & pro-social attitude and health care, but in Germany participants reported higher quality of sleep. Young adults in both countries gave similar responses: a) they rated their quality of life lower than middle-age adults (mean difference=-4.83, SE=1.63, p < 0.01) and old adults (mean difference=-8.61, SE=2.04, p < 0.01), b) they showed also lower optimism than middle-age (mean difference=-1.02, SE = 0.35, p < 0.02) and old adults (mean difference=-1.51, SE = 0.34, p < 0.01), and c) they showed lower well-being than middle-age (mean difference=-2.37, SE = 0.81, p < 0.02).

Conclusions: Young adults rated their quality of life, optimism, and well-being during pandemics lower than middle-age and old adults, and experienced higher levels of trait anxiety and difficulty to relax.

It seems that young adults show a lower psychological adjustment than other age groups during COVID-19 crisis. It is concluded that quality of life, optimism, and well-being during the pandemics are affected differently according to country and group of age, suggesting individual differences in psychological vulnerability across cultures and ages, and consequently the need of specific interventions to cope with the pandemic's crisis.

Covid-19 Impact on the Health of Portuguese Teachers

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Keywords: Cognitive problems; exhaustion; musculoskeletal dysfunctions; professional well-being; voice disorders

Objective: The purpose of this study is to understand the impact of Covid-19 pandemic on the physical and mental health of Portuguese teachers.

Methods: The sample consists of 1779 Portuguese teachers (1423 female and 356 male); 58% (n=1029) over 50 years of age; 72.7% (n= 1293) with more than 21 years of service; and 48.1% (n= 856) teaching 3rd cycle/secondary school. We studied the distribution of responses for the variables: professional well-being, exhaustion, cognitive problems, musculoskeletal dysfunctions and voice disorders, and performed an analysis of variance (ANOVA), followed by *Bonferroni post-hoc* test (p<.05), according to gender, age, years of service and teaching level.

Results: 13.6% of the teachers reported feeling ill-being during the performance of their professional activity; 85.6% exhaustion; 74% musculoskeletal disorders; 68.9% cognitive problems; and 59.7% voice disorders.

The results according to gender, age, years of service show significant differences in all health dimensions (p<.05), except for teaching level for musculoskeletal disorders (F=.982, p=.427). In all health dimensions, the most significant differences occurred in the groups of teachers aged 20-21 years and 56-70 years; length of service between 0-5 years and those of more than 21 years; and the teaching level between 1st cycle and special education, with the exception of professional well-being where the greatest difference was reported between preschool and 3rd cycle/secondary teachers (95% CI].9076;4.6364[; p=.000).

Conclusions: The Covid-19 pandemic has worsened teachers' health status and professional well-being. The impact of these results on the quality of teaching should be the focus of future studies.

Protein intake and grip strength in community-dwelling older adults: analysis of individual participant data from four longitudinal cohorts

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Keywords: Handgrip strength; joint models; muscle strength; one-stage meta-analysis; PROMISS

Objective: Higher dietary protein, alone or in combination with physical activity (PA), may slow loss of age-related muscle strength in older adults but studies on this topic are lacking. We investigated the longitudinal relationship between protein intake and grip strength, and the interaction between protein intake and PA, using four longitudinal ageing cohorts in the PROMISS consortium.

Methods: Individual participant data from 5584 older adults and up to 8.5 years (mean: 2.5, SD: 2.4 years) of follow-up from the Health ABC, NuAge, LASA and Newcastle 85+ cohorts were pooled. Baseline protein intake was categorized into <0.8, 0.8 to <1.0, 1.0 to <1.2 and ≥1.2 g/kg adjusted body weight (aBW)/day (d). The prospective association between protein intake, its interaction with physical activity (cohort-specific tertiles), and grip strength (z-score) was determined using joint models (hierarchical linear mixed effects models and a link function for Cox proportional hazards models).

Results: Grip strength declined on average by 0.018 SD (95%CI: -0.026, -0.006) every year. No associations were found between protein intake and grip strength (sex and cohort-specific z-score) or rate of decline of grip strength in models adjusted for sociodemographic, anthropometric, lifestyle and health variables (e.g., protein intake ≥1.2 vs <0.8 g/kg aBW/d: β= -0.003, 95%CI: -0.014,0.005 SD per year). There also was no evidence of an interaction between protein intake and physical activity.

Conclusions: We found no evidence to support the hypothesis that higher protein intake (expressed as g/kg aBW/d), alone or in combination with higher PA, slows the rate of grip strength decline in older adults in this study.

Benefits of a fall prevention psychomotor program in dual-task cost and interference: two cognitive-motor paradigms

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Keywords: Aging; older adults; cognition

Objective: This study aimed to analyze the effect of a 12-week fall prevention psychomotor program in dual-task cost and interference of two different cognitive-motor paradigms.

Methods: Eighteen community-dwelling older adults (16 women; mean age: 74.1±5.3) were assigned to a psychomotor intervention program. Timed up and go test (TUG) [s] was assessed in single and dual-task (DT) conditions. Thus, DT measures included: a) TUG while counting backwards by one from 100 (DT-TUG-C); b) TUG whereas nominating as many animals as possible (DT-TUG-A). DT cost for both tasks was calculated as *((DT-TUG time - TUG time)/ TUG time) *100*, and the interference as calculated as *DT-TUG cognitive errors [n] + cognitive stops [n] + motor stops [n]*. Wilcoxon test comparisons were performed.

Results: Significant differences were found in both DT paradigms between the baseline and post-intervention in the variable *DT-TUG cognitive errors [n] + cognitive stops [n] + motor stops [n]*: DT-TUG-C decreased 56.5% (2.3±1.9 vs. 1.0±0.8, *p*=0.012), and the DT-TUG-A decreased 40.6% (3.2±1.6 vs. 1.9±1.6, *p*=0.008). The effect size [r] was medium in both DT-TUG-C (0.42) and DT-TUG-A (0.44).

Conclusions: Results suggest that the psychomotor program decreased the cognitive-motor interference on both DT paradigms by reducing errors and stops in DT performance. This is a relevant finding because DT ability impacts fall risk.

Harassment at work and its relationship with burnout in teachers

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Keywords: Burnout; harassment at work; quantitative; teachers

Objective: The present study aims at evaluating the prevalence of workplace bullying and its relation to burnout in Portuguese teachers.

Methods: The study was applied through a digital questionnaire consisting of a sociodemographic component and scales: Leymann Inventory of Psychological Terrorization (LIPT-60) and Maslach Burnout Inventory (MBI). The final sample obtained consists of 2003 Portuguese teachers.

Results: Most of the sample worked in public institutions (88.3%), were female (76.9%) and the average age was 47.73 years (SD=8.20). Regarding the level of education they worked on, 7.9% were teachers of pre-school education, 46.4% of elementary education, 28.2% of secondary education and 17.4% of higher education.It was found that more than half of the sample, that is, 54.5% had already heard about harassment at work/mobbing and 42% reported having observed harassment behaviours in co-workers. When filling out the LIPT-60, 75.1% of teachers reported having suffered at least one conduct of harassment. However, only 22.5% of the sample acknowledged being a victim of aggression. The most perceived aggression behaviours by the victims were: "criticize their work" (47.6%), "interrupt them when they speak" (43.6%) and "their superiors do not let him/her express or say what you have to say" (41.6%). All factors that constitute the LIPT-60 scale were positively correlated with the "exhaustion" and "depersonalization" dimension and negatively correlated with the "personal fulfilment" dimension of the MBI scale.

Conclusions: Only 1 in 5 teachers are aware of being victims of this phenomenon, and this result is related to the destruction of the victim's self-esteem, carried out by the aggressor. The most common aggression behaviours verified in the workplace were the blocking of communication and defamation, that is, acts that are carried out in order to denigrate the victim's image without leaving visible physical evidence. Teachers who experience an average rate of harassment at work have a higher value of exhaustion and depersonalization and a significantly lower value of personal achievement.

Animal foods and mobility limitations in community-dwelling young-old adults: longitudinal analysis of the EpiDoC cohort

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Keywords: ADL; food intake; function; older adults; protein.

Objective: Nutrition and especially protein play a role in optimally stimulating muscle protein synthesis and maintaining function. Animal foods are excellent sources of high-quality protein. Therefore, we aimed to determine the association between the frequency of animal foods consumption and mobility limitations in young-old adults.

Methods: The analytic sample was composed of 2860 community-dwelling adults aged 50 and over from a nationally representative longitudinal cohort of Portuguese adults who were followed up to 2.7 years. An animal food intake score was derived from the frequency of consumption of meat, fish and dairy products. Mobility limitations were defined as self-reported difficulty standing from a chair, walking, and climbing stairs. To determine the association between animal food intake and mobility limitations mixed effects logistic models were fitted.

Results: There were cross-sectional associations between quartiles of animal food intake and mobility limitations (for example, for walking outdoors Q4 v Q1: OR: 0.29; 95% CI: 0.15, 0.56) in unadjusted models, but no difference in the rate of change of mobility limitations over time in unadjusted models. These associations were no longer present when more complex models adjusted for sociodemographic, lifestyle and health variables were fitted. For example, participants in Q4 of animal food intake were not more or less likely to have difficulty climbing stairs than those in Q1 (OR: 0.95; 95%CI: 0.65, 1.38) nor have a different slope over time (OR: 0.86; 95%CI: 0.54, 1.37).

Conclusions: No convincing evidence was found to support an effect of animal foods intake on self-reported mobility limitations in this study.

Physical and motor fitness tests for older adults living in nursing homes: preliminary results of a systematic review

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Keywords: Assessment; autonomy; field tests; functional capacities; institutionalized

Objective: This review aimed to investigate which assessment methods are most used in the evaluation of the physical and motor fitness of older adults living in nursing homes.

Methods: Electronic databases were searched from January 2005 to December 2020. We used MeSh terms and relevant keywords (e.g., 'nursing homes', 'physical assessment', 'motor tests'). Data extracted from the selected studies included year of publication, type of study, age of population sampled, sample size, assessment tests (physical or motor), and abilities/skills that were measured. The review was registered in PROSPERO (CRD42020212338).

Results: Initially, 3971 articles were identified, of which 3616 were excluded based on title or because they were duplicates. Of the remaining 355, 94 were excluded based on title and abstracts. For the lasting 261 articles, the full text was analyzed. In this phase, 19 additional articles were excluded, resulting in a total of 242 articles (27939 people) to include in the review. According to the collected data, the most common assessments were the Handgrip Strength test (36.0% of the articles), the Timed Up and Go test (28.5%), the Short Physical Performance Battery (16.9%), the Berg Balance Scale (13.2%) and the Tinetti-test (13.2%).

Conclusions: This review allowed us to know which tests are most relevant when evaluating people living in nursing homes. This information may be relevant for health professionals working with these populations. It is noteworthy that the most evaluated capabilities in this population are balance, strength, and gait.

Executive functioning in patients with type 2 diabetes: preliminary results of a comparative study

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Keywords: Cognition, cognitive impairment, executive function, type 2 diabetes

Objective: Although executive functioning (EF) seems to be affected in people with Type 2 Diabetes Mellitus (T2DM), few studies used a comprehensive set of tests to strengthen this evidence and to help better scientific decision-making. Therefore, this study examined the differences in EF in patients with T2DM relative to a non-diabetic control group through a comprehensive set of cognitive tests focusing several executive functioning abilities.

Methods: A group of patients with T2DM (n=36, 65.9±6.8 years, diabetes duration of 16.5±10.1 years) and a control group without T2DM matched for age and mini mental state examination (n=26, 65.9±6.8 years) were enrolled in this study. All subjects completed a battery of neuropsychological tests for EF, assessed by the Stroop color and word test, phonemic and semantic verbal fluency test, and Trail-Making-Test, part B.

Results: Statistical analysis adjusting for age and education factors, showed that patients with T2DM performed worse than the control group on the Stroop-word (-9.59, [-17.54;-1.63], $p=0.019$), Stroop-color (-7.14, [-12.65,-1.64], $p=0.012$) and Stroop-word-color tasks (-5.16, [-9.96,-0.35], $p=0.036$), and on the semantic (-5.75, [-8.84;-2.66], $p<0.001$) and phonemic fluency tests (-5.84, [-11.43;-0.25], $p=0.041$). No significant difference was found across groups on the Trail-Making-Test ($p=0.514$).

Conclusions: The preliminary results show that patients with T2DM have worse EF compared to non-diabetic controls in most cognitive tests. Regular cognitive screening is an important preventive measure for people with T2DM, and should inform long-term prevention programs to tackle the negative impact of the disease in EF and other cognitive domains.

Post-fasting gender differences in fat mobilization during aerobic exercise

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Keywords: Energy; exercise; fasting; fat-burning; obesity

Objective: This study aims to analyze the fat oxidation through aerobic exercise in post night- and daytime-fasting states, comparing fat mobilization between genders.

Methods: A sample of 46 young adults (23 females and 23 males with 26.4±7.1 years and 26.4±5.2 years, respectively) fulfilled the inclusion criteria and voluntarily accepted to participate in this study. All participants were all evaluated twice within a 7 to10 days frame. Body composition was accessed by Dual X-ray Absorptiometry. Participants underwent the Bruce treadmill test to determine VO_2max for aerobic exercise intensity control. After randomization, all participants performed two post-fasting aerobic exercise sessions, after an overnight fast and after a daytime fasting. The 24-hour diet prior to exercise was controlled for all the participants. Heart rate was measured objectively with the use of the Polar PE 3000 and metabolic intakes using the portable gas analyzer Cosmed K4b[2]®.

Results: No differences were found between the two protocols, either in fat oxidation (%) or in the amount of fat mobilized per day (g/day) ($p= 0.71$ and $p= 0.76$ respectively). Gender differences were found in the post night- and post daytime-fasting. In both conditions, males presented higher values of fat consumption (g/day) compared with women ($p=0.00$ in post night-fasting and $p=0.01$ in post daytime-fasting).

Conclusions: Fat oxidation through aerobic exercise doesn't differ between post night- and post daytime-fasting in similar fasting conditions. Nevertheless, men are more able to mobilize fats as a source of energy compared to women.

Physical activity and its associations with quality of life of female victims of domestic violence living in shelters

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Keywords: Accelerometry; domestic violence; health; women

Objective: Considering the impact of continued violence on general health, we aimed to assess the physical activity (PA) and quality of life of female victims of domestic violence (DV) living in shelters. Also, we aimed to search for associations between PA, quality of life and violence length among our sample.

Methods: Seventeen female victims participated in this study (mean age=43.9 ± 13.1 years). Participants were asked to use an accelerometer for seven days to assess PA and filled out the WHOQoL-Bref and the EuroQol – 5D to assess quality of life, as well as a brief survey assessing violence information.

Results: Fourteen (82%) participants met the accelerometer criteria ($\geq$ 5 days per week). Six participants (42.9%) reached the recommendations of at least 150 minutes of moderate-intensity PA per week (M=172.5±136.3). Also, participants had, on average, 8.9 (±1.5) hours/day of sedentary behavior. Moderate-to-vigorous PA (MVPA) per week was positively correlated with the environment domain of WHOQoL (Spearman rho (SR)=.555, p=.040). Also, EuroQol scale was negatively correlated with total duration of violence (SR=-.603, p=.013), but positively correlated with total sedentary hours/day (SR=.639, p=.014). The length of time since violence ended correlated positively with the number of steps (SR=.803, p<.01).

Conclusions: Participants had low levels of PA. Physical activity, perceived quality of life and length of time with and without violence, were correlated among female victims of DV. Movement-based interventions should be promoted in victims' shelters as it could positively impact their physical activity behavior, quality of life and recovery process.

Participation and physical complaints in a sample of portuguese female artistic roller-skaters: A cross-sectional survey

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Keywords: Artistic roller-skating; frequency; injury; participation; physical complaints; questionnaire

Objective: Teaching and health professionals need to attain knowledge about the specific needs of artistic roller skaters when aiming to be effective in training and preventing physical complaints or injuries. Hence, the lack of epidemiological studies on artistic roller skaters validates the study to characterise athletes, participation habits and determine the frequency of physical complaints or injuries. Aim: to describe the athlete's body composition, participation habits and frequency of physical complaints in female artistic roller skaters within the last 12-months.

Methods: The study design was a cross-sectional online survey. A web-based survey was specifically developed to gather epidemiological details on female artistic roller skaters. The self-response questionnaire covered participant details, participation habits, injury history, and physical complaints within the last 12 months. Athletes were invited through official and informal communication channels devoted to artistic roller-skating.

Results: This study included 143 female artistic roller skaters. Sixty-seven (46.9%) athletes experienced 175 episodes (injuries or physical complaints) within the last 12-months, an average of 2.61 complaints per skater. Physical complaints mainly disturbed the lower limbs (53.1%), followed by the trunk (24.0%) and upper limbs (22.9%). The most common places were the knees (16,6%), back (10,9%) and wrists (10,3%).

Conclusions: Our findings suggest that artistic roller-skating physical complaints are frequent. Multiple episodes were common. Several factors were associated with physical complaints, including the number of coaches, changing frequency of boots, number of training hours per week, number of training hours before competition, and previous injuries.

The effect of a relaxation intervention on interoceptive awareness of college students' – preliminary results

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Keywords: Body awareness; body-oriented intervention; interoception; stress; higher education

Objective: The main purpose of this study was to examine the effect of a psychomotor relaxation program on college students' interoceptive awareness, an important foundation of social-emotional competence.

Methods: Twenty female college students (21.4 ± 2.3 years) were tested on two occasions, 4 weeks apart to establish a baseline measure (pretest 1 and pretest 2), and then engaged in an 8-week psychomotor relaxation program. Participants were tested again after the intervention program (post-test). The intervention program was comprised of two 20-minute sessions per week combining body awareness, muscle tone regulation, and breathing exercises. Interoceptive awareness was measured by the Multidimensional Assessment of Interoceptive Awareness (MAIA).

Results: Repeated measures ANOVA showed that MAIA scores changed significantly along the three assessments on two of the seven subscales: *noticing* ($F(1.9,36.1)=5.67$, $p=0.008$) and *emotional awareness* ($F(1.4,26.9)=5.53$, $p=0.017$). Post hoc analysis with a Bonferroni adjustment revealed that *noticing* improved from pretest 1 to post-test (25 %, $p=0.024$), and from pretest 2 to post-test (32 %, $p=0.025$). Regarding *emotional awareness*, significant improvements were found from pretest 2 to post-test (32 %, $p=0.005$). In both MAIA subscales, scores did not change significantly during the baseline period (from pretest 1 to pretest 2).

Conclusions: These results suggest that relaxation interventions are effective strategies for improving specific dimensions of interoceptive awareness in college students. Helping students understand their body and emotional states might be particularly important for college student's health and well-being.

Optimal time-window for performance enhancement in basketball college players

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Keywords: Warm-up; team sports; countermovement jump; linear sprint performance; salivary biomarkers; potentiate performance

Objective: Warm-up (WU) is a widely accepted strategy to potentiate performance. However, acute performance enhancement is highly dependent on individual characteristics, exercise mode, and time-window to the activity. This study aimed to investigate the effects of a 5- and 10-min passive rest after a basketball standard WU on physical performance and sympathetic stimulus associated salivary biomarkers.

Methods: Nineteen college basketball players participated in the study. The physical performance was assessed by countermovement jump capacity, 20m linear sprint and handgrip strength. The players were tested before WU (Pre-WU), 5 minutes after WU (Post-5') and 10 minutes after WU (Post-10'). Saliva was sampled collected at each moment and flux, α-amylase activity and protein content were evaluated. A repeated measures analysis was computed to identify the effect of the time-window on the considered variables, and Cohen's $d_{unbiased}$ as effect size was applied to identify pairwise differences

Results: The time-windows factor showed significant effects ($p< .001$) in countermovement jump, 20m sprint, and saliva markers. Pairwise differences were identified for Pre-WU vs Post-5' and Pre-WU vs Post-10' (with the small effect size for countermovement jump and moderate to large for both 20m sprint and biochemical markers). Trivial results were identified when compared Post-5' vs Post-10' in jumping capacity and biochemical markers and a small decrease in the 20m sprint.

Conclusions: Jumping and running performances were acutely enhanced after WU. An increase in α-amylase and protein accompanied these improvements. While jumping capacity was maintained during the entire time-window, the sprint ability declined from Post-5' to Post-10'. These results bring critical practical implications for post WU routines, highlighting the importance of manipulating time-windows to enhance specific performance outcomes.

Users and health professionals' perspectives regarding Portuguese primary care services: a focus on dementia

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Keywords: Career, communication, general practitioner, person with dementia, qualitative research

Objective: To deepen our understanding of how dementia care is delivered in Portuguese primary care services.

Methods: In this presentation, we jointly present three qualitative studies in primary care centers (Lisbon area), using purposive sampling. A quality framework for dementia care delivery guided the research. In the first two studies we conducted semi-structured separate interviews with primary care users (persons with dementia and their family careers) and staff (GPs, nurses, social workers). In the third study, we analysed live primary care consultations. The framework approach, the thematic analysis and data triangulation were components of the data analysis.

Results: The GPs responsibility to address different subjects in consultations seemed to condition their contribution to dementia management. Patients had limited access to dementia care because of undefined roles and poor coordination of health professionals, lack of social workers and inadequacy of community services. They displayed conspicuous difficulties in expressing themselves in consultations, more than would be expected from their level of dementia-related disability. Finally, careers' needs were poorly assessed.

Conclusions: Overall, Portuguese primary care teams need enhanced competence in dementia, nurse-led systematic care of users and families, improved strategies regarding careers' assessments and more extensive community support. Further analysis of triadic consultations may provide process measures for assessing the quality of clinical practice and consultation training: this aim is being pursued by our team in another, ongoing project. Our findings strongly suggest that Portuguese primary care teams are not yet prepared to comply with policy expectations regarding the management of dementia.

The person with dementia, the career and the doctor: triadic interactions in primary care

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Keywords: Alzheimer's disease, consultation, dementia, general practitioner, primary care

Objective: In what concerns dementia, medical encounters typically involve triads (a patient, a career and a physician). This is the case in many primary care consultations, where triadic dynamics have raised interest. Prior research suggest that physicians tend to focus on careers, not on patients, which may compromise the delivery of person-centered care in dementia. As the process should be better understood to optimize clinical outcomes, we aim to explore these triadic interactions in Portuguese primary care settings.

Methods: This study regards the ongoing project 'Dementia in Primary Care: the Patient, the Career and the Doctor in the Medical Encounter' (Bayer Investigation Grant | NOVAsaúde Ageing 2018). Five consultations with persons with dementia, their careers and GPs were thematically anlysed, using NVIVO®.

Results: The most frequent type of interaction was between GPs and careers. Disabling dementia communication patterns were patent in most consultations, seemingly contributing to the difficulties of persons with dementia in deciding about their own care. Careers often interrupted patients, speaking on their behalf, while GPs often downplayed the patients' concerns by colluding with careers.

Conclusions: In these consultations, both careers and GPs may have limited the expression of persons with dementia thoughts and wishes. Our findings align with first impressions that, despite some GPs' efforts, truly patient-centered approaches are limited in clinical scenarios. This is important, given the dearth of evidence from live-recorded primary care consultations. After conclusion of the consultations' analyses, results and practical recommendations will be discussed in focus groups of careers, staff and hopefully people with dementia. Despite significant delays due to the current pandemic, we look forward to completing this rewarding research.

Relationship between age and cardiac risk factors in Patients with Coronary Artery Disease

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Keywords: Aging; cardiovascular diseases; cardiovascular risk factors; coronary arteriosclerosis; prevention

Objective: To investigate the relationship between age and clinical characteristics, physical fitness, and in-hospital outcomes in middle-aged obstructive coronary artery disease (CAD) patients compared to older ones.

Methods: The present study sample included 43 patients with CAD who were admitted to the Hospital of Évora. Middle-aged patients were defined as those in the youngest quartile (40–60 years) compared to the older quartile (>60 years). Spearman correlation coefficient of ranks (ρ) was used to examine the association between the age groups and outcomes.

Results: Middle-aged patients compared to older patients showed a strong association with being smokers ($p < 0.05$), with lower Thyroid-stimulating hormone (TSH) levels ($p < 0.05$) and with greater cardiorespiratory fitness (487.5 ± 81.5 m vs. 415.8 ± 133.9 m, $p < 0.05$). Older patients showed a strong association with muscle fatigue ($p = 0.01$) and low muscle strength levels ($p = 0.02$). Low muscle strength levels were noted in the middle-aged population ($p = 0.03$), compared to reference values.

Conclusions: Our study has shown that the cardiovascular risk profile in middle-aged patients could be different from that presented by the older pairs. Clinical characteristics and performance measures should be considered when evaluating the risk for Cardiovascular Disease development of in a younger population.

Medical Care Is Frequent And Associated With Overuse Of Low-Value Care For Low Back Pain In Portugal: Results From A Population-Based Study

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Keywords: Low back pain; prevalence; diagnosis and management procedures; medical care

Objective: To estimate prevalence of medical care seeking, and to characterize and compare diagnostic workup and management procedures for Low Back Pain (LBP) between primary and secondary levels of care in the adult Portuguese population.

Methods: The present study was conducted under the scope of EpiReumaPt (2011-2013), a population-based study including a representative sample of Portuguese adults (n=10,661). Individuals with self-reported medical care history seeking for LBP within the previous 12 months (n=2,618) were considered. Patients' self-reported data collected was explored to characterize medical care seeking, and diagnostic and management procedures for LBP.

Results: A prevalence of medical care seeking for LBP of 38.0% (95%IC, 35.9-40.1%) was found. Primary care in isolation (45.3%), multiple care (primary plus secondary care) (28.8%) and secondary care in isolation (25.9%) were the sought levels of care for LBP. Several distinct structural-based diagnoses were diagnosed by physicians, mainly supported by laboratory and imaging tests performed to 91.1% of individuals. Disc herniation (20.4%) and osteoarthritis (19.7%) were the most frequent diagnosis, while x-rays (63.7%) were the most frequent diagnostic procedures. 75.1% of individuals self-reported being treated for LBP by their physician, 80.4% with oral medication/ pills and 15.3% with injectables. The mean duration of pharmacological treatment was 104.24 (266.80) days. The use of structural-based diagnosis, laboratory and imaging tests, and pharmacological treatment were generally aggravated when secondary care was considered (p<0.05).

Conclusions: Our results show that medical seeking for LBP is frequent and associated to overdiagnosis and overuse of pharmacological treatment.

Factors associated with clinical and radiographic severity in people with Osteoarthritis: a cross-sectional population-based study

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Keywords: Clinical severity; epidemiology; hip osteoarthritis; knee osteoarthritis; radiographic severity

Objective: To characterize the population with hip and/or knee osteoarthritis (OA) according to clinical severity profile, and identify sociodemographic, clinical and lifestyle factors associated with clinical and radiographic severity.

Methods: Participants with OA diagnosis from the EpiReumaPt study (2011–2013) were included (n=1087). Sociodemographic, clinical and lifestyle variables, were collected in a structured interview. Clinical severity was classified as the tertile distribution of HOOS/KOOS5 scores. Radiographic severity was defined with Kellgren-Lawrence Classification. These data were collected in a clinical appointment with a rheumatologist and were

defined as the outcomes of this study. Factors associated with severity were identified using ordinal logistic regression models (p<0.05, 95%CI).

Results: People in the high HOOS/KOOS tertile tended to be older (64.39±0.70 years), female (75.2%), overweight (39.0%) or obese (45.9%) and had multimorbidity (86.1%). Factors significantly associated with higher clinical severity were age (55-64 years: OR=3.18; 65-74 years: OR=3.25; ≥75 years: OR=4.24), female sex (OR=1.60); multimorbidity (OR=1.75), being overweight (OR=2.01) or obese (OR=2.82) and having anxiety symptoms (OR=1.83). Years of education was inversely associated with higher clinical severity. Factors significantly associated with higher radiographic severity were age (65-74 years: OR=3.59; ≥75 years: OR=3.05) and being in the high HOOS/ KOOS tertile (OR=4.91). Being a female and live in Lisbon or in the Centre region were inversely associated with the higher radiographic severity.

Conclusion: This study reinforces the need for effective preventive and management strategies to avoid OA progression in Portugal, namely programs for weight loss and multimorbidity.

Pharmacogenomic biomarkers as source of evidence to effectiveness and safety of antidepressant therapy

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Keywords: Antidepressants; biomarkers; depression; pharmacogenomic; pharmacotherapy

Objective: The main goal of this work was to identify, to describe, to characterize and to classify the scientific evidence associated with the use of pharmacogenomic biomarkers in the antidepressant treatment.

Methods: The work was developed in two phases: i) the search for pharmacogenomic biomarkers in summaries of antidepressant drugs with marketing authorization in Portugal; and ii) the undertaking of a systematic literature review (SLR) based on the data obtained in the first phase, with the principal objective of finding international literature that could describe and characterize the biomarkers found before and possibly identifying other relevant ones. Finally, the levels of evidence and recommendation grades were classified.

Results: After running the search queries, a total of 103 papers were obtained, 63 of which were included into SLR. Among the 26 drugs with marketing authorization in Portugal, only 16 had pharmacogenomic information. The pharmacogenomic biomarker identified more frequently was CYP2D6. These results were mostly supported by the SLR. It also revealed the existence of other relevant biomarkers. Most of the studies considered show a good level of evidence, which guarantees the reliability and good recommendation

grades. As for the database (built during phase i), the results were merely informative, resulting in no specific recommendations.

Conclusions: Most pharmacogenomic variants are not studied or acknowledged by the genetic tests and still need more scientific research that confirm their usefulness. Therefore, only a small number of variants is considered when prescribing antidepressant drugs. Besides, genotyping of patients is not common clinical practice.

Colorectal cancer: Opportunistic use of Computed Tomography for Bone Density and Abdominal Area assessment - Retrospective Cohort

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Keywords: Chemotherapy; gender disparity; observational study; osteoporosis; survivorship

Objective: To determine the effects of chemotherapy on bone mineral density (BMD) and abdominal area (AA), in patients with colorectal cancer. Determine the relationship between the two variables after chemotherapy.

Methodology: 50 patients of both genders underwent CT before chemotherapy and one year later. The variables BMD and AA were retrospectively evaluated using Computed Tomography. Multiplanar reformats were performed to place a circular region of interest (CRI) in the first lumbar vertebra, to measure BMD (HU) and AA (cm^2). Mean values of BMD and AA were compared before and after chemotherapy intervention. The relationship between BMD and AA after the intervention was assessed.

Results: There were differences in the effects of chemotherapy intervention on BMD and AA, before and after treatment in general and between sexes. For BMD and AA, women had lower mean values than men, before and after chemotherapy. In the pre-post chemotherapy comparison, BMD significantly decreased in women by about 16.6 HU (p=0.007) and AA increased in both sexes (women 52.7cm2, p=0.007 and men 41.3cm2, p=0.003). The treatment effect was greater for AA (EF=0.3) in the total sample and greater in women in both BMD and AA (EF=0.3 and EF=0.4, respectively). There was no relationship between the AA and post-intervention BMD.

Conclusion: Chemotherapy intervention has negative effects on BMD and AA, with different impacts considering gender. Women have more significant effects and greater magnitude of treatment effect. New studies are important to assess the progression and prognostic of BMD and AA over the colorectal neoplasm survival.

Monitoring the Effectiveness and Safety of HIV/AIDS Pharmacological Therapeutics Based on Pharmacogenomics Evidence

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Keywords: Antiretroviral, biomarkers, effectiveness, HIV/AIDS, pharmacogenomics, safety

Objective: The main goal of this work was to identify, to describe, to characterize and to classify the scientific evidence associated with the use of pharmacogenomics biomarkers in the HIV/AIDS treatment.

Methods: The project was divided into two parts: i) update of the database with pharmacogenomics biomarkers identified in summary of product characteristics (SPC) of antiretroviral drugs with authorization in Portugal; and ii) the elaboration of a systematic literature review (SLR), based on the data obtained from the first phase, which aimed to identify studies in the literature that identified and described the biomarkers found in SPC and other potentially relevant ones. Finally, the levels of evidence and recommendation grades were classified for every study.

Results: Most drugs with SPC in Portugal contained pharmacogenomic information. The most frequently identified biomarker in SPC was CYP3A (not specified), contrary to what is observed in the literature, where CYP2B6 was identified as the most prevalent biomarker. SLR also revealed the existence of other relevant biomarkers, especially in the case of tenofovir.

Conclusion: Most variants need some clinical investigation, and only a small number are considered when prescribing these drugs. Furthermore, genotyping is not a common practice, requiring greater incentives and investments in this area.

The changing public-private pattern of the Portuguese health system over the last decade

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Keywords: Public, private, Portuguese health system, evolution

Objective: The disinvestment in the public service since the Great Recession, coupled with management problems, may have changed the public-private mix of the Portuguese health system. The paper describes changes in the supply and demand public-private mix.

Methods: We used publicly available data from the National Statistics Institute (INE) and the National Health Interview Survey (NHIS). Data from INE measured changes in the supply and use of public and private health services, for the 2012-2019 period. We then modeled the probability of having private health insurance as function of the NHIS survey wave (2005/6, 2014, 2019), controlling for socioeconomic status (SES), self-reported health, age, and sex. We used logistic regressions and tested interactions between waves and SES.

Results: Over the 2012–2019 period, private hospitals increased by 1,534 beds, while public ones lost 1,276. The total number of consultations increased by 68.8% in the private sector and 9.8% in the public sector, while surgeries increased by 32.9% and 8.6%, respectively.

Between 2005 and 2019, we observed a statistically significant increase in private health insurance of 14.9 percentage points. The increase was significantly higher among those in the highest income quintile (+18.3pp) compared to those in the lowest income quintile (+13.4pp).

Conclusion: The weight of the private sector has substantially increased over the last decade, which may indicate a change in the nature of the Portuguese health system. This calls for action in regulation and financing of the private sector, to avoid breaches in the universality and equity principles.

The main concerns of adults living with Type 2 Diabetes Mellitus

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Keywords: Concerns about T2DM; individuals living with T2DM; person-centred care; qualitative study; type 2 diabetes mellitus

Objective: Understanding concerns of individuals living with type 2 diabetes mellitus (T2DM) on various aspects of life, essential to meet individual healthcare needs and develop a patient centric approach, is the main objective of multiphase CONCORDIA study. The CONCORDIA qualitative phase aimed to comprehensively identify the main concerns of individuals living with T2DM.

Methods: Five focus groups were conducted: two with HCPs and three with adults living with T2DM in different stages of disease. The study was implemented at the Portuguese Diabetes Patient Association, and an intentional sampling was used to maximize the differences within participants' characteristics. The participants were grouped according to: diagnosed ≥12 months ago without complications; diagnosed ≥12 months ago with minor complications; and with major complications. Data were analysed using thematic analysis.

Results: Forty-seven items of concerns (sub-themes) were identified and grouped into fourteen themes: (1)discrimination and stigma; (2)health-care; (3)other people's stories; (4)social context; (5)lifestyle; (6)professional context; (7)treatment; (8)disease management; (9) quality of life; (10)family context; (11)complications; (12)sources and quality of information; (13)monetary costs; and (14)mental health.

Conclusions: T2DM concerns are not limited to clinical aspects of the disease, and it's expected that each one has a different preponderance. Substantiated on this phase, a questionnaire was constructed to be applied in the further quantitative phase which will allow to measure the relevance on each "concern", from the HCP´s viewpoint and individuals living with T2DM, allowing group comparison.

The effects of a mind-body program on quality of life and health indicators of breast cancer survivors

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Keywords: Complementary therapies; oncology; psychomotricity; relaxation; survivorship

Objective: Breast cancer in women is associated with adverse effects that affect quality of life (QoL) and may persist after treatment. Although breast cancer survivorship has been significantly improved, many women still experience long-term distressing symptoms after the treatment phase. Body-mind interventions such as relaxation have been suggested as a complementary but important approach for breast cancer survivors. However only a few studies have yet assessed their efficacy on QoL and health indicators. The present pilot study examined the feasibility and the effects of a psychomotor relaxation program on breast cancer survivors' QoL and health indicators.

Methods: Women survivors of breast cancer were assigned to a psychomotor relaxation intervention (PRG;n=9) or a control group (CG;n=9). The PRG participated in an 8-week psychomotor relaxation program (two 50-min sessions per week) in the Oncology Department of a public hospital, and the CG maintained their usual routines. QoL was measured through the WHOQOL, and health indicators were obtained through the Short Form Health Survey-36 and salivary cortisol concentrations.

Results: The current study showed that the relaxation program was feasible and well tolerated by the participants. Compared to the CG, by the end of the program, the PRG showed better QoL and health indicators (role physical, general health, vitality, social functioning, role emotional, and mental health). In the fifteenth session, salivary cortisol concentrations significantly decreased from pre-session to post-session.

Conclusions: This study provided preliminary evidence that psychomotor relaxation is an effective therapeutic approach for improving QoL and health indicators of breast cancer survivors.

Absenteeism in the Portuguese National Health Service during the COVID-19 pandemic

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Keywords: Healthcare workforce; absenteeism; absenteeism management; COVID-19

Objective: The COVID-19 pandemic posed innumerous challenges to the Portuguese National Health Service (NHS), including the absence of essential workers for health organizations. Therefore, the present work intended to quantify the absenteeism among the NHS workers during the period of COVID-19 pandemic (2019–2020).

Methods: This work used data from the NHS Transparency Portal, regarding the number of healthcare professionals and the number of absence days in the period of analysis. Absenteeism was compared, before and during the pandemics, in absolute numbers and as a percentage of workforce working days. Additionally, this work analyzed the main reported absence categories.

Results: Results showed an 25% increase in absenteeism among NSH workers, from 2019 to 2020. The highest number of absence days were registered in May 2020, summing 598.323 days. Sickness, parental leaves and accident at work or an occupational disease were the most frequent absenteeism categories reported.

Conclusions: Several factors might explain the excess of absence days among the NSH workers, during the pandemics, but some of them are likely to be associated with COVI-19 infection, either directly or indirectly. These absent rates might lead to increased difficulties and constraints in healthcare organizations, threatening the adequate response to the pandemics.

Gender differences in depressive symptoms, socioeconomic status and perception of need of mental health services

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Keywords: Depression; gender; mental health services; Portugal; socioeconomic status

Objective: To identify depressive symptoms profiles among men and women and to understand their relationship with socioeconomic status and perception of mental health services use (MHS) need.

Methods: We used data from the 6th Portuguese National Health Survey, with 3,807 participants with mild, moderate or severe depression (Personal Health Questionnaire-8 ≥ 5). We used gender-stratified latent-class analysis to identify subtypes of depressive symptoms. We characterized each latent class by education and income, and perception of need of MHS.

Results: Latent classes among men were: "Mood and somatic symptoms" (50.6%), more present among those with secondary education; "Severe depression" (32.9%), more common among those low-educated or with higher education, and within the two poorest income quintiles; "Somatic symptoms" (16.5%), more frequent among the highest income quintile. Perception of need was lower for "Somatic symptoms" (8.1%), and higher for "Severe depression" (42.4%).

Latent classes among women were: "Mood and somatic symptoms with low self-esteem" (47.8%), more common among those low-educated; "Somatic symptoms", more present among those with secondary education; and "Severe depression" (26.9%), more common among those within the highest income quintile. Frequency of perception of need was 11.2% for "Somatic symptoms", 25.5% for "Mood and somatic symptoms with low self-esteem", and 43% for "Severe depression"

Conclusions: Presentations of depression seem to differ by gender and socioeconomic status. The need perception is generally low, even among those severely depressed, while gendered symptom profiles may impact MHS use. Understanding depression subtypes and their distribution across the population may help reducing the treatment gap.

Socioeconomic inequalities in needs perception and affordability concerns for depression treatment in Portugal

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Keywords: Depression; gender; mental health services; Portugal; socioeconomic status

Objective: To assess the link between socioeconomic status, needs perception for mental health services (MHS), and affordability, among persons with depressive symptoms.

Methods: Data from the 6th Portuguese National Health Survey (2019) were used. Among those with depressive symptoms (N=3,807; Personal Health Questionnaire-8 ≥ 5), we used gender-stratified logistic regressions to model perception of need for MHS and affordability concerns (unfulfilled MHS needs due to financial constraints), as a function of education and income quintile, adjusting for age groups, marital status, and severity of symptoms. Health insurance (private and subsystem) was used as mediation variable.

Results: Compared to low education, high-educated men lad lower perception of need (17.2%, OR=0.46, 95%CI=0.45-0.47) and high-educated women had higher (31.3%, OR=1.29, 95%CI= 1.27-1.31). Men in the first income quintile were more likely to recognize need (34.2%, OR=1.12, 95%CI=1.09-1.15). Among those with self-reported needs, affordability constraints were more likely among women with secondary (41.8%, OR=1.56, 95%CI=1.53-1.60) and men with higher education (61.9%, OR=18.3, 95%CI=17.3-19.4). Those in the poorest income quintile were more likely to report affordability concerns (66.5%, OR=18.7, 95%CI=17.6-19.8 among men; 51.5%, OR=5.77, 95%CI=5.57-5.97 among women). Adjusting for health insurance (private and subsystem), the disadvantage of low-income individuals decreased, as well as the disadvantage of high-educated men.

Conclusions: High-educated men seem more likely to report both low perceived need and affordability concerns. Low-income individuals' concerns about affordability question universal mental healthcare and may contribute to wider health inequalities. Differential access to health services seems to contribute to socio-economic inequalities in MHS use.

Contributing for the deployment of the European Public Health Information Portal in time of COVID-19

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Keywords: COVID-19; capacity building; health information; information portal; population health

Objective: The European Public Health Information Portal (PHIRI - Horizon 2020) aims at setting-up a research infrastructure to facilitate and generate the best available evidence for research on population health and well-being of populations as impacted by COVID-19. The Portal is a one-stop-shop, where Health Information (HI) Capacity Building is one of the services provided, to promote health information research and tackle HI inequalities between the Member States. The CHRC Team's work aims at contributing to the development of a catalogue of services on population health capacity building in health information and COVID-19.

Methods: Through a desk research and literature review, the activities were collected by three stages: 1) the search for the main HI institutions & organizations; 2) the activities shared by these sources on their official websites and 3) the detailed collection of information on each activity (description and technical information).

Results: A website on HI capacity building was developed, including 80 activities that have been identified, of which 24 (30%) were webinars, 17 (21%) courses and 10 (13%) asynchronous training activities. Regarding availability, 52 are activities with a fixed date, as opposed to 28 that are available permanently. The materials and courses found European materials and address different languages. They also focus on courses and materials about population health and non-pharmaceutical approaches to managing the COVID-19 pandemic - e.g., vaccination, lockdown plans, data analysis, etc. A European School on Health Information (ESHI) was established.

Conclusions: The activities developed reached some recommendations on the sustainability for the HI in Europe. The roadmap for sustainability on HI Capacity Building mainly addresses the identified HI needs across Europe, from which the ESHI has emerged.

Psychomotor relaxation in women with breast cancer - an individual intervention

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Keywords: Cancer; psychomotricity; quality of life; relaxation; therapeutic touch

Objective: Women with breast cancer experience a multitude of concerns that overwhelm their daily lives, affecting their quality of life. Psychomotor relaxation, due to its characteristics, may contribute to an improvement in quality of life, and may be a softening response to the effects associated with breast cancer treatment. To examine effects of relaxation mediated by therapeutic touch on quality of life, and health indicators (pain, anxiety and cortisol concentrations) of women with breast cancer undergoing treatment

Methods: 23 adult women with breast cancer participated, ten in control group (CG) and thirteen in experimental group (EG). The EG experienced an individual intervention of relaxation mediated by touch twice a week for eight weeks (40 minutes each session). The EC maintained usual routines. An evaluation of quality of life and health indicators was performed before and after the intervention. Quality of life was assessed through EORTC-QLQ C30, and health indicators with Pain Quality Assessment Scale, Hospital Anxiety and Depression Scale, and cortisol concentrations.

Results: At the end of the program, the EG verified significant improvements, in the decrease in Fatigue (p=.039) and in perspective of Health and Quality of Life (p= .020), and in the decrease in cortisol concentrations (p=.046). There were significant differences in the Perception of Quality of Life (p=0.020) between groups (EG and CG) at the post-intervention moment. It was improved in EG and worsened in CG.

Conclusions: The results suggest that relaxation using therapeutic touch may be a beneficial therapeutic approach for the breast cancer treatment phase.

Pharmacovigilance Teaching-Learning: a direct and indirect cross-sectional analysis in Portugal

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Keywords: Adverse drug reactions; health professionals; higher education (health); medication safety; pharmacovigilance; risk management; spontaneous notification

Objective: Describe and characterize the teaching-learning process of pharmacovigilance in Portugal. To do so, it is necessary to analyze the knowledge, perceptions, and postures of students and health professionals, as well as the main difficulties that had been identified by the professionals regarding spontaneous notification.

Methods: It used a mixed analysis method, composed of a direct analysis (with the spread of an online questionnaire on social media based on a non-probabilistic technique, as a convenience, referred to as snowball and also via e-mail to several institutional contacts and student's nucleus); and by indirect analysis (through an explicit revision of the curricular plan in the health degrees by keywords searching in the course plans).

Results: From a total of 650 participants, 403 (62%) were students and 247 (38%) were professionals. About 84.4% of the students and 54.7% of the professionals affirmed they had never done an adverse drug reaction spontaneous notification. Only 24.6% of the students and 17.8% of professionals refer the existence of specific course contents reserved for pharmacovigilance in their degrees. Most students and professionals who answered the questionnaire showed interest on the integration of pharmacovigilance in the academic curriculum of the healthcare courses and in the on-going training plans of the health professionals. In addition, the majority totally agreed that pharmacovigilance adds value to its practical application in a professional context and claims to feel more motivated to report suspected adverse reactions, if taught. Analyzing 93 course plans, only 3 referred to as mandatory pharmacovigilance curricular units and 39 do not address any key-terms.

Conclusions: Since there are few institutions teaching programmatic contents regarding the pharmacovigilance in the different healthcare courses and given the questionnaire results, it's evident the need for a wider reflection regarding the further training and constant update of the practicing professionals as well as in the diverse health institutions, investing in the creation of an academic curriculum that integrates pharmacovigilance in healthcare courses.

MiniVent: A low-cost pressure-controlled ventilator system for emergency use

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Keywords: COVID-19, mechanical ventilator, open-source, PC-CMV, rapidly manufactured

Objective: To address the issue of ventilator shortages due to the COVID-19 pandemic, our group developed the proof-of-concept of a low-cost and rapidly scalable open-source mechanical ventilator system for emergency use.

Methods: A simplified architecture of MiniVent was designed to meet the low-cost and easy-to-produce pre-established properties of our device. To carry out such an approach, we decided to use only components commonly available in the market or components of easy production with usual manufacturing techniques, such as 3D printing. The design of MiniVent comprises a pneumatic unit that controls the quality of the air and oxygen mixture and maintains the pressure on the patient's lungs at the desired preset value, along the respiratory cycle. The control unit was programmed on a microcontroller and is responsible for ensuring the respiratory rate and the inspiratory-expiratory ratio, selected by the user. To ensure the fulfilment of all the security and specification requirements of pandemic ventilators, we followed the mandatory specifications presented in the document - Rapidly Manufactured Ventilator System (RMVS) - published by the Medicines & Healthcare products Regulatory Agency (MHRA). A set of tests was performed using different ventilatory parameters for instrumental verification of MiniVent's physical and biological performance. A stability test was also carried out during 35 hours of uninterrupted operation to analyse whether the expected dynamics of the output pressure were maintained over this time.

Results: The ventilator system developed allows prescribing different breathing rates, fractions inspired of oxygen (FiO_2), inspiratory-expiratory ratios (I: E), positive inspiratory pressures (PIP) and positive end-expiratory pressures (PEEP), which can be easily adjustable to the patient's condition.

The results of a set of tests assured the reliability of all the ventilatory parameters set by the user. Furthermore, MiniVent showed

a good performance over 35 hours of uninterrupted operation, which pointed out the stability of this device. In addition, the device was tested in a porcine model showing good mechanical performance and adequate arterial blood gas throughout all test periods. When compared with commercial ventilators, MiniVent exhibited a similar performance of ventilation.

Conclusions: MiniVent could be a reliable solution to overcome the shortage of commercial ventilators in emergencies, such as the recent COVID-19 pandemic. This device presents a production cost of under 1000€ and does not need specialized technical assistance so it might be a viable solution even in lower-income countries.

Mobile technologies to support healthcare provider to healthcare provider communication and management of care

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Keywords: mHealth; systematic review; telehealth; telemedicine

Objective: Mobile technologies can potentially expand the use of telemedicine to facilitate communication between providers. We aimed to assess the effects of mobile technologies versus usual care for supporting communication and consultations between healthcare providers on performance, acceptability and satisfaction, healthcare use, patient health outcomes, acceptability and satisfaction, costs, and technical difficulties.

Methods: We followed the Cochrane and EPOC methodological procedures. We searched for randomised trials at CENTRAL, MEDLINE and four other databases from January 2000 to July 2019. We searched clinical trials registries, references of relevant systematic reviews and contacted topic experts.

Results: We found 19 relevant studies (more than 5766 people) who needed health care. Sixteen studies were from high-income countries. When primary healthcare workers use mobile technologies to consult with hospital specialists, they may increase the likelihood of retinopathy screening for people with diabetes, or receiving an ultrasound if referred with symptoms, and may reduce referrals or a visit to the clinic for people with a skin condition or referred for clinic follow-up for different health problems. When emergency doctors use mobile technologies to consult with hospital specialists, patients are probably managed slightly more quickly.

Conclusions: Interventions may reduce the time between presentation and management of the health condition when primary care providers or emergency physicians use them to consult with specialists, and may increase the likelihood of receiving a clinical examination among participants with diabetes and those who required an ultrasound. There was little evidence of effects on participants' health status and well-being, satisfaction, or costs.

Non-linearity in 3rd graders handwriting copy task: a pilot study

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Keywords: Fractal dimension; approximated entropy; variability; children

Objective: The complex organization of handwriting variability, or fractal dynamics, theoretically represents the adaptive capacity of the locomotor hand/arm system to be precisely controlled. Fractal dynamics are sensitive to various individual constraints and task constraints. The temporal organization of these sequences of movements has a complex fractal-like structure characterized by self-similarity over multiple time scales. The purpose of this study was to investigate: 1) variability's structure of a handwriting copy task (c1) and its repetition after a 5-minute of copy (c2); 2) variability between the 5 first lines of c1.

Methods: 28 children aged 7-8 years (16 female, 12 male) performed a 5-minute copy from the Concise Evaluation Scale for Children's Handwriting (BHK) on a digitizing table and repeated the first five lines. Movements were recorded using an x-y digitizing tablet with an inking pen and MovAlyzeR®. Nonlinear dynamic parameter approximate entropy (ApEn) was used to assess pattern of the regularity of respective kinematic time series, and we used the detrended fluctuation analysis (DFA) method to characterize the fractal dynamics of handwriting.

Results: We found significant differences using t-tests in the regularity between c1 and c2 of global handwriting in the horizontal component and in the vertical component. Between lines differences were found in both components in lines #2, #4 and #5.

Conclusions: Five minutes of handwriting does not appear to affect fractal dynamics. The variability between lines appears to be more sensitive to ApEn. Nonlinear methods are an important tool to quantify changes in task graphomotor behavior.

Mobile applications for quick adverse drug reaction report: a scoping review

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Keywords: Adverse drug reactions; mobile apps; pharmacovigilance; Portugal; spontaneous notification; underreporting

Objective: This study aims to identify existing mobile applications for adverse drug reaction (ADR) reporting. Hence, the subsequent questions were made through the process: What are the

implemented mobile apps for adverse drug report? Where are they used? Are they contributing to minimize the sub notification issue?

Methods: A scoping review methodology was selected. Joanna Brigg Institute guidelines (2015) were considered and the framework proposed by Arksey and O'Malley (2005) was followed.

Results: A total of 91 studies were identified. After duplicate removal, 84 were screened based on title and abstract, of which 19 remained for full-text review. A final number of five articles were included in this systematic scoping review, revealing five implemented mobile apps for ADR report. The articles were published in 2012 (n=1), 2017 (n=1), 2018 (n=1), and 2019 (n=2).

The five mobile apps identified were: 1 - MedWatcher (EUA,2012); 2 - VigiBIP (France,2015); 3 - WEB Recognising Adverse Drug Reactions (WEB-RADR) project (2014), and within this project, country-specific mobile apps - United Kingdom (Yellow Card,2015), Netherlands (Bijwerking,2016) and Croatia; 4 - Med Safety, a generic version of the WEB-RADR app, (Burkina Faso,2017) resulting from a collaboration between several institutions including WHO; 5 - ADR PvPi app (India,2017).

Conclusions: In an increasingly technological world, several countries have developed mobile apps for quick ADR reports. This type of official mobile app still does not exist in Portugal. It is essential to reflect on its national development, to increase the notification rate, which remains low.

Is it possible to calculate lumbar load and lordosis with Dual-energy X-ray absorptiometry? Case Study

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Keywords: Biomechanics; muscle activity; radiology; strength; vertebral body

Objectives: Calculate lordosis and lumbar load using DXA (dual energy X-ray absorptiometry) compared to conventional X-ray in trunk flexion and assess which muscle activation is most recruited in trunk flexion/extension movement.

Methodology: The study included a woman with no history of lumbar pathology. An image of the trunk flexion in lateral decubitus was performed at two different angles (0º and 45º), starting from the neutral position (0º) through DXA, conventional X-ray (XR). For each technique (DXA and XR), we analyse two different profiles. Stress on the 3rd lumbar vertebral body (L3) was assessed as: Stress (N/cm^2) = (0.455 PC/CSA) (cos 45°+ 0.186 H sin50°/d. Trunk muscle activity was measured, in lateral decubitus with slight knee flexion (trunk at 0º), trunk at 45º and return to the initial position. We recorded four trunk muscles' surface electromyography (SEMG) activity: spinal erector, iliocostal spinal erector, multifidus, and rectus abdominis.

Results: Stress (0º) XR=1.33 N/cm^2, Stress (0º) DXA=1.31 N/cm^2; Stress (45º) XR=14.32 N/cm^2 and Stress (45º) DXA=14.29 N/cm^2. Physiological lumbar lordosis (θ) was θ XR= 40º and θ DXA= 48º. The rectus abdominis showed greater activity during trunk flexion and the multifidus muscle during trunk extension.

Conclusion: Further studies to calculate the load and lumbar lordosis with DXA are needed to assess its reliability and reproducibility. It is essential to develop intervention programs that prepare for the impact of daily loads on the lumbar spine to prevent osteoporotic fractures, back-pain and herniated discs.

Effects of a Sensorimotor Pilates based program on gait control

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Keywords: Fractal; gait; metronome; sensorimotor; variability

Objective: The complex organization or the fractal dynamics of gait variability represents the adaptive capacity of the locomotor system and is sensitive to task constraints, as walking to an auditory stimulus (metronome). The fractal analysis of stride interval time series can be used as a marker for gait adaptability, gait disorder and individual fall-risk assessments. The purpose of the study was to evaluate the impact of specific sensorimotor exercises, based on the *Pilates* method (PSM), on the complexity of gait dynamics.

Methods: Sixteen adults are regular exercisers of *Pilates Method* (rPM) and regular *Pilates Method* with a specific sensorimotor exercise program (rPSM). The participants were asked to walk twelve minutes using an Inertial Measurement Unit at an auditory stimulus (metronome) based on their self-pace. The detrended fluctuation analysis (DFA) method was used to characterize the fractal dynamics - α1 and sample entropy to assess the pattern of the regularity of stride interval time series - The data was compared with ANCOVA statistical test.

Results: There was a significant effect of PSM on the fractal scaling exponent of the stride interval time series (F [1,2] = 4.55, p = 0.011], with an effect size w^2 = 0.282, but no significant difference in sample entropy.

Conclusions: The rPM group increased their fractal scaling, suggesting that walking with constraint is more challenging and complex for their locomotor system, i.e., altering the temporal structure of walking. This observed that sensorimotor exercise program with *Pilates Method* can increase adaptive capacity of the locomotor system to a task constraint.

A multimodal exercise program plus brain games apps has effects in fine motricity and hand strength of older adults in long-term care facilities

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Keywords: Brain-training apps; nursing homes; multimodal program; elderly

Objective: This study aimed to investigate the effects of a multimodal intervention that includes physical exercise and brain-training apps (on tablets) on upper limbs muscle strength and fine motricity of older adults in long term care facilities.

Methods: Thirteen older adults (86.3±3.6 years) living in long-term facilities participated in this study. The participants were first evaluated on two occasions (pretest1 and 2) one month apart to establish a baseline/control period and were re-evaluated 6 weeks after the intervention (post-test). The intervention was conducted 4 times a week, 60 minutes per session, for 6 weeks; during this period, multimodal physical exercises on two days, and exercises in tablet on another two days, were interspersed. Arm strength was assessed by the arm curl test; handgrip strength of the dominant and non-dominant hand was assessed by hand dynamometer; fine motricity for dominant, non-dominant hand and both hands was accessed by the purdue pegboard test.

Results: Repeated measures ANOVA showed that the intervention influenced fine motricity of the dominant hand ($F(1.9,21.2)=11.6$, $p<0.001$) and handgrip strength of the dominant hand ($F(1.9,21.1)=6.7$, $p=0.006$). Bonferroni post hoc tests showed that fine motricity and handgrip strength decreased from pretest1 to pretest2 in -14.3% ($p=0.009$) and -7.9%, ($p=0.014$), respectively. Both fine motricity (20.8%, $p=0.005$) and handgrip strength (8.6%, $p=0.034$) improved from pretest2 to post-test.

Conclusions: The results demonstrate that a multimodal intervention has benefits in fine motricity and in the strength of the dominant hand. These variables are very important for the activities of daily living of elderly people, allowing them to perform tasks essential to their autonomy.

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