5th Statistics on Health Decision Making: Personalized Medicine

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P01
Analysis of Cervical Node Metastasis in Oral Cavity Squamous Cell Carcinoma Patients

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Keywords: Lymphatic metastasis; Mouth; Neck dissection; Neoplasms; Neoplasm staging

Background/Objective: Oral Cavity Cancer is a frequent type of Head and Neck Cancer, associated with high mortality rates worldwide. One of the main prognostic factors for the disease is regional lymph node metastasis that is associated with survival rate reduction by 50%. Reported tumour sites more frequently associated with regional node metastasis vary throughout literature. Therefore, we aimed to conduct a retrospective study that would allow us to identify the relationship between patient and SCC tumour factors with the rate of neck metastasis and compare our data with the conclusions from similar studies.

Methods: A retrospective study was conducted in the Oral Medicine and Oncology Consultation of the Stomatology Department from Centro Hospitalar Universitário Lisboa Norte, comprehending patients diagnosed with Squamous Cell Carcinoma between January 2015 and April 2021. As eligibility criteria we considered patients which had clinical charts with complete information including sociodemographic variables, tumour site and disease staging at diagnosis. We excluded tumour sites with only two diagnosed cases, considering bias risk. Three groups were defined according to a clinical/pathological reason. The current research was approved by an independent ethics committee.

Results: The sample includes 151 cases, the majority of which were males (≈59%) and with average age at diagnosis (± standard deviation) of 65 ± 13 years-old. Oral tumour sites with highest percentage of cases with clinical positive lymph nodes (cN+) by the time of diagnosis were inferior gingiva (72.7%, n=16), mouth floor (66.7%, n=22), oropharynx (64.7%, n=11), retromolar trigone (58%, n=11) and ventral tongue (57%, n=16). Sites with fewer cases of cN+ were inferior lip (31%, n=4) and superior lip (n=0). Similar results were found in our sample when operated tumors (pN+) were considered: floor of the mouth (65%, n=13), retromolar trigone (63.6%, n=7), inferior gingiva (46.2%, n=6) and ventral tongue (45%, n=9). Tumour sites with fewer pN+ cases were hard palate (25%, n=1), superior gingiva (16.7%, n=1) and inferior lip (0 out of 7 cases). According to Fisher's exact test there is no statistically significant association (p-value=0.1506) between primary tumour site and cervical node disease (either cN+ or, whenever available, pN+).

Conclusions: Our data seem to indicate an association between primary tumour site and N+, being cervical metastasis more frequent when tumour site was posterior and caudally located. Lower lip had the fewer positive lymph nodes, probably correlated with the inclusion in the same group of oral mucosa and skin cancers. Despite these findings, the association was not statistically significant.

P02
Odontometrics analysis in a commingled human remains from 1755 Lisbon's Earthquake

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Keywords: odontometry; legal medicine; forensic dental anthropology, forensic odontology.

Introduction: Odontometrics stands as a valuable tool in Legal Medicine as it can provide information to identify human remains in cases where the body is badly decomposed, burned or disfigured. Since teeth are unique to each individual, their measurements can be compared to dental records or databases to establish a positive identification and, therefore, draw a postmortem profile. The study of dental measurements is often used to estimate the sex, race and ancestry of a deceased individual in a variety of situations. The variation observed when studying odontometrics has immensely contributed over time to the investigation of hominid evolution and the population groups' diversity, according to their geographic distribution. Thus, the evaluation of odontometrics belonging to commingled human remains found in Academia das Ciências de Lisboa from the 1755 Lisbon's Earthquake was conducted in this study.

Aims: The first purpose is to comprehend if the odontometrics obtained in this study's sample fit its time and region, through the comparison of other populations in different locations. The second one is focused on the analysis of odontometrics' evolution through time, in the same region.

Materials and methods: The whole sample of 1479 teeth was weighed in two different types of electronic scales and measured, using a digital caliper, through three diameters: mesiodistal (MD), buccopalatine (BP) and crown height (CH).

Results: The values of MD, BP and CH of each type of tooth were measured, revealing a great concentration of observations with values close to the median and few observations with distant values (quite few outliers and low values of standard deviation and interquartile range). Mean values for each type of tooth (per quadrant) were compared with those published in other similar studies. Regarding studies from the same or close period, similar values were observed in Coimbra (Portugal) and Italy, while a sub-Saharan African population reveals higher odontometric values in general, namely for crown diameters. In addition, several recent odontometric studies (post 1950) in Europe reveal slightly higher MD and BP diameter values.

Conclusion: Odontometrics obtained in the sample under analysis is within the expected standards for that epoch in Europe. Furthermore, results captured in recent studies reveal MD and BP diameters values slightly high. Hence, odontometrics can be applied in the identification of human remains and in the characterization of paleodemographically disarticulated populations, revealing themselves as a crucial method to Legal Medicine and Forensic Odontology.

P03
Forensic Dental Age Assessment: Effect size on real age Medical Report

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Keywords: Dental Age Assessment; Effect Size; Panoramic Radiography; Forensic Reports; Forensic Dentistry

Background/Objectives: Age estimation plays a crucial role for living individuals in various scenarios such as criminal responsibility determination, sexual abuse, pornography, and asylum seekers. Dental age estimation of subadults has been widely assessed through methods which involved analysis of teeth's open apices and eruption. Many authors have created and improved distinct scorings and methodologies for age estimation based on teeth development and eruption. The aim of this study was to evaluate the performance of age estimation methods such as Cameriere, Demirjian, and AlQahtani in quadrants of the left side and right side of each jaw and accuracy in both sexes, as well as to determine how reliable is the method for human age estimation by calculating the effect size.

Methods: 483 orthopantomographic images were selected from Centro Hospitalar Universitário Lisboa Norte aged between 6 and 15 years old. Several measurements of widths and lengths and classification of teeth development stages were performed, according to each age estimation method.

Results: The correlation coefficients obtained for the three methods were close to 90% regarding the exact age for both sides. Cameriere and Demirjian have a very strong correlation for the third quadrant (0.977). Regarding the estimation error correlation coefficient, Demirjian and AlQahtani values were low, whereas Cameriere's was –0.516. However, on both sides, there's a greater variability of results for the Demirjian method. Comparing females and males, the statistical analysis showed no significant differences for all methods. Besides, the Wilcoxon test for paired samples almost always reveals significant differences between the estimated values and age, with almost all p-values lower than 0.001, with small effect (as $0.2 < d < 0.5$) except for Demirjian on the third quadrant ($d = 0.61$) in both genders and in the entire sample, therefore revealing a medium effect. On the opposite side is the Demirjian method on the fourth quadrant, which presented a p-value of 0.153 (with d=0.027) for the entire sample, 0.798 (d=0.05) in the sample restricted to females and 0.038 (d=0.075) in males. Hence, Demirjian method revealed the best results on one quadrant and the worst on the other quadrant.

Conclusions: When the courts request a forensic examination on age estimation, it is recommended a combined application of different dental age assessment methodologies, to promote the obtention of more realistic and reliable results. The statistic effect size helps the judge in determining if the difference is real or if it is due to a change of factors. Thoughtful consideration should be given to sex, identifiable human group, geographic population specificity, and environmental factors.

P04
Effect of statins intake in the risk for progression of age-related macular degeneration – a comparison of two Cox regression models applied to the Coimbra Eye Study

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Keywords: Age-related macular degeneration, statins, Cox regression model.

Background:Age-related macular degeneration (AMD) is a multifactorial disease, influenced by a combination of environmental factors (such as age, smoking, lifestyle, diet) and genetic factors. Several studies suggest a link between lipid-lowering medications, such as statins, and AMD progression, with contradictory results. We aim to study the association of statin exposure on the progression to AMD in a Portuguese population from a central region of Portugal (the Coimbra Eye Study).

Methods:To test the association between AMD progression and statin intake, we used two models: the use of statins as a time-independent covariate in a Cox proportional hazard regression or as a time-dependent covariate in an extended Cox regression model. Both models were adjusted for potential confounding known to influence AMD, including age, gender, body mass index, smoking status, diabetes and arterial hypertension assessed at the baseline. The correlation between the two eyes for the same patient was taken into account using a robust (sandwich) standard error.

Results: 683 subjects were eligible for the analysis, with a mean age of 65.6 ± 6.8 years at baseline and where 55.2 % were females. The mean follow-up time was 6.3 ± 0.6 years, and 122 subjects (17.9%) progressed to AMD. 170 subjects started taking statins between the baseline and the follow-up visit. Although both models have similar results, the hazard proportional assumption is violated when the use of statins is a time-independent covariate (Cox proportional hazard regression model). In our study statins intake is indeed not constant over time because the participants started taking medication only after some time from the baseline visit date. When using the extended Cox regression analysis, the time where the participants started taking the medication and the time where they stop taking the medication is included. There was a significant statistical difference in the risk of AMD with statins (HR=0.509, 95% CI 0.302-0.860; p-value=0.012). We also found significant differences in the increased risk for progression with age (HR= 1.064, 95% CI 1.036-1.094; p-value<0.001) and in smokers or ex-smokers compared to non-smokers (HR=1.801, 95% CI 1.073-3.023; p-value=0.026). Although not shown, other statins intake variables were also tested, namely, time drug exposure and statins dosage, with similar results.

Conclusions: An extended Cox regression model can demand a complex implementation and interpretation in ophthalmologic studies, but it is critical and suitable when the exposure variable is not constant over time and when patients are exposed beyond the baseline visit.

P05
Association between the adrenoreceptor β2 gene and pediatric asthma severity– a study of the PACMAN cohort

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Keywords: asthma, oral corticosteroids, glm, negative binomial, zero-inflated, hurdle.

"Pharmacogenetics of Asthma medication in Children: Medication with Anti-Inflammatory effects" (PACMAN) is an observational retrospective pharmacy-based study carried out in 2009, in the Netherlands, aiming to investigate the effects of genetic variation on treatment response to asthma medication in children and to identify (profiles of) SNPs that characterize response phenotypes. Data on respiratory symptoms and medication use, including medication type and amount, was collected from pharmaceutical records of asthmatic children and data on the children's sex, age, genetic traits, and ethnicity.

We aimed to assess the association between asthma severity and the Arg16Glu polymorphism of the β2 adrenoreceptor gene (ADRB2). This gene is expressed in bronchial muscle cells, which is involved in the physiological response of the airway response and has been associated with clinical drug response and asthma exacerbations. We used the PACMAN data and considered the dispensing of oral corticosteroid prescriptions as a proxy of the disease severity since corticoids are commonly used in uncontrolled asthmatic states (exacerbations).

We considered two different genetic models – additive and genotypic, which can be translated for analysis purposes into a numeric format, corresponding to the number of copies of the minor allele, and categorical (each genotype representing a category), respectively. We used models of the class of the Generalized Linear Mixed Models for count data with excess of zeros, namely zero-inflated and hurdle models, considering a Negative Binomial distribution to account for overdispersion. Both models included the polymorphism in the zero and count components and were adjusted for children's baseline characteristics.

In both approaches to deal with the excess of zeros, a significant effect of the polymorphism was found only in the binary component of the models. In the count component, only sex and age showed a significant effect. This points towards the existence of an effect of the polymorphism in the presence of asthma exacerbations, with not shown effect in the frequency of OCS prescription.

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P06
Communication Strategies used by Health Professionals and Finalist Students from Health Areas with People with Aphasia

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Introduction: Aphasia is a communication disorder, prevalent in about 1/3 of stroke survivors. People with aphasia (PWA) have frequent contact with different health professionals (HP), who must be prepared for successfully communicate with these population.

Objective: To identify the communication strategies used with PWA by HP and finalist students (FS) from health areas, trained in Portugal, and explore their knowledge, training and needs on the subject.

Methods: Exploratory, cross-sectional, descriptive, qualitative and quantitative study, developed in 2 phases. Phase 1: development of a self-completion questionnaire with closed and open questions, based on the literature, and its content validation through a panel of experts, considering a Content Validity Index (CVI) greater than 90%. Phase 2: exploratory analysis of the HP/FS communication with PWA through the referred questionnaire, disseminated online, nationally. In order to participate in this study, the following inclusion criteria were defined: 1) being a HP/FS trained in Portugal; 2) having or having had contact with PWA. Quantitative data were analyzed using Microsoft Excel (2013 version) and qualitative data using thematic analysis.

Results: The expert panel (phase 1) consisted of HP from various health areas (N=7), requiring two rounds for a CVI > 90% in all items of the questionnaire. A total of 197 HP and 26 FS participated in the study (phase 2). The communication strategies identified as the most used by HP/FS were visual and physical strategies (gestures, images, writing and drawing). There was also a tendency to use the same strategies (gestures, images/symbols, reduction of verbal discourse, use of concise speech, writing and drawing) for different purposes (understanding, expression, recognition of skills). The explored subject seems to be absent in some curriculum plans, with a reduced level of knowledge of the participants, with more than half of them referring the need to seek training/information on the subject.

Conclusions: Self-reported strategies used by HP/FS trained in Portugal for communicating with PWA seem to be fundamentally visual and physical strategies. The participants tend to use these strategies in a similar way, regardless of the purposes, suggesting lack of knowledge or in-depth knowledge on the subject, despite the interest in optimizing the process. Given the growing number of PWA in Portugal, it is suggested that this theme should be explored in an explicit and structured way in the curricula of the various areas of health and that some training should be organized for HP/FS already in active practice.

P07
Association of the practice of contact sports with the development of amyotrophic lateral sclerosis

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Keywords: amyotrophic lateral sclerosis, contact sports, risk-factor, smoking, trauma

Objectives: Amyotrophic lateral sclerosis (ALS) is a rapidly progressive neurodegenerative disease, currently with no cure, involving mainly the motor system. High-intensity physical activity and sports prone to repetitive injuries of the cervical spine and head (when associated with vigorous practice) have been suggested as possible risk factors for ALS. Our objective was to evaluate the relationship between the practice of contact sports (boxing, hockey, football, rugby) and ALS.

Methods: The study included 2247 individuals, 1326 patients and 921 controls from several European countries. Analysis of the effect of contact sports on ALS was conducted in male participants only, as very few women practiced contact sports. Logistic regression models were used with the response variable as the presence or absence of ALS, with α=5% significance level.

Results: A relationship between the practice of contact sports and ALS was found, with those practicing contact sports having 76% higher odds of an ALS diagnosis (OR=1.76, p=0.001). In addition, univariate analyses for age (higher risk for older people, p<0.001), smoking status (higher risk for ex-smokers, p=0.022) and tobacco exposure (higher risk for more exposure, p=0.038) also indicated that these variables are risk factors for ALS. In multivariate models, in addition to age, the interaction term between practice of contact sports and tobacco exposure was still significant (p=0.03).

Conclusions: This is one of the largest studies on the role of contact sport in ALS development. Our results support the existence of a relationship between the practice of sports with repetitive trauma at the level of the cervical spine and head, and ALS. This risk appears to be enhanced by tobacco exposure.

P08
Self-perceived functioning in relation to existing symptoms 12 months after SARS-COV-2 infection in workers of an industrial facility in Aveiro Region – an observational study.

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Keywords: Functioning; Occupational; Health; SARS-CoV-2; Symptoms; WHODAS 2.0; Worker

Background/Objective: Most individuals recover after acute SARS-CoV-2 infection, but some may suffer persistent symptoms with potential medium and long-term consequences. The present study aims to analyze self-perceived functioning concerning existing symptoms 12 months after SARS-CoV-2 infection in workers of an industrial facility in the Aveiro Region.

Methods: Observational study, including workers with a positive SARS-CoV-2 RT-PCR/TRAg test. After 12 months of the infection, the occupational health team collected information on sociodemographic variables, manifested symptoms, and perceived functioning assessed using the WHODAS-2.0–12 items - where '12 points' means the highest functioning. Data analysis included descriptive statistics and univariate and multivariate linear regression.

Results: Eighty-five workers were infected with SARS-CoV-2, 77.7% were male, with a mean age of 36y1m±9y8m, 36.8% have a higher education level and 17.7% reported at least one chronic condition. Thirty workers (35.3%) reported persistent symptoms, with fatigue (27.7%) and arthralgia (14.4%) being the most described. Whodas 2.0 mean score was 15,7±5,0, and items most frequently reported as presenting limitations were difficulties in working (43.5%), concentrating (35.3%), and walking one kilometer (35.3%). Self-perceived functioning depended on educational level (β=-2.37, CI95% -4.53 ; -0.21) or the existence of a chronic illness (β=3.53, CI95% 0.81 ; 6.24), and the level of functioning is associated with the persistence of symptoms of fatigue (β=4.02, CI95% 1.75 ; 6.29), headache (β=4.13, CI95% 0.84 ; 7.42), and myalgia (β=3.30, CI95% 0.14 ; 6.45).

Conclusions: Persistent symptoms 12 months after symptomatic SARS-CoV-2 infection have an influence on self-perceived functioning. Occupational health services should regularly address the assessment of persistent symptoms of SARS-CoV-2 infection to prevent possible impacts on daily activities and participation.

P09
Disclosing gene signatures in gliomas via classification and dimensionality reduction methods

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Keywords: Elastic net, Feature selection, Glioma, Multinomial logistic regression.

Background/Objectives: Gliomas are among the most aggressive cancers, showing a large intertumoral heterogeneity, which calls for the need to develop novel and updated targeted therapies for each glioma type. The knowledge about gliomas is rapidly evolving due to the advances in molecular technologies, as revealed by the updates in the World Health Organization (WHO) classification of tumors of the Central Nervous System (CNS) [1, 2], with the incorporation of key molecular features in the classification of gliomas. The main objective of this work is the identification of key transcriptomic biomarkers of glioma heterogeneity across the latest WHO glioma classifications, aiming at contributing to disease understanding at the gene expression level and ultimately helping management of these tumors.

Methods: The uniform manifold approximation and projection (UMAP) method [3] and multinomial logistic regression using the elastic net penalty (MLR-EN) [4] were applied to RNA sequencing (RNA-seq) data from glioma patients obtained from The Cancer Genome Atlas (TCGA) database. The dataset comprises astrocytoma and oligodendroglioma lower-grade gliomas (LGG), and glioblastoma (GBM), the most common and aggressive glioma. For each patient, two labels were considered, regarding the 2016 WHO classification of tumors of the CNS [1] and its 2021 updated version [2]. The UMAP was first applied for the visualization of the separability of glioma types with the complete dataset. MLR-EN models were built based on the RNA-seq data for the classification of patients into glioma types and the identification of genes associated with each class as potential biomarkers of intertumoral heterogeneity. Model parameters controlling the strength of the penalty were optimized by cross-validation. After gene selection, UMAP representations were obtained for the subset of genes selected to evaluate how well these genes separate glioma types.

Results: The UMAP representations for the complete dataset showed good separability among glioma types regarding both the 2016 and 2021 classifications, with a noticeable improvement in the heterogeneity among clusters with the update in the WHO classification. Very accurate MLR-EN models were obtained, yielding AUC values of over 90% and identifying subsets of genes that greatly improved the observed separability. For most misclassified patients in the 2016 WHO classification, an update in the corresponding label was verified in the 2021 WHO classification.

Conclusions: MLR-EN uncovered relevant biological information regarding glioma heterogeneity through the selection and evaluation of genes as potential diagnostic indicators, highlighting the increasing relevance of RNA-seq data in glioma classification, in line with the 2021 WHO glioma classification update.

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P10
Explanatory variables consistency and association strengths in sepsis diagnosis: a methods comparison

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Keywords: Sepsis, Procalcitonin, Feature selection, Association effect

Sepsis is the main cause of death in burn patients and Procalcitonin (PCT) has already been identified in some studies as biomarker of sepsis. The purpose of this study was to evaluate the relative importance, the selection consistency and association strengths of several explanatory variables (e.g., PCT) for sepsis diagnosis. The analysis includes data from 104 burn patients who were admitted to Coimbra Burns Unit in Portugal between January 2011 and December 2014, during the second week of their hospital stay, and who had a total burn surface area (TBSA) of 15% or higher and underwent subsequent surgery.The methods employed in this study include logistic regression (LR), logistic regression by the stepwise automatic selection method based on the Akaike information criterion (StepAIC), logistic least absolute shrinkage and selection operator (LASSO), and Random Forest (RF). Logistic regression (LR) is a classic method used to model the relationship between a binary outcome and predictors. The stepwise automatic selection method based on StepAIC is utilized for feature selection in logistic regression, allowing for the automatic identification of relevant predictors. Logistic LASSO applies a regularization technique to logistic regression, promoting sparsity in the model by shrinking less important predictors to zero. Lastly, Random Forest (RF) is an ensemble method that constructs decision trees and combines their outputs to improve predictive accuracy and handle complex interactions among predictors.The results of different regression methods consistently show the selection and estimation of the association effect on the occurrence of sepsis in the following variables: PCT (Procalcitonin), Prothrombin, Temperature, Burn degree, Inhalation injury, and Alcoholism. The ensemble method (random forest) identifies PCT as the variable with the highest degree of importance, based on both mean decrease accuracy and mean decrease Gini criteria. This study highlights the significance of PCT in the diagnosis of sepsis, but also underscores the importance of other variables that consistently can enhance prediction models for sepsis occurrence.

P11
Identification of the Molecular Basis of Heart Failure through Microarray Merging

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Background/Objectives: Microarrays are powerful tools for health-related research, aiding diagnostic/treatment of diseases by understanding underlying mechanisms. One advantage of microarrays is that they allow for the simultaneous analysis of thousands of genes, making them useful in cardiovascular disease(CVD) research. They enable identification of deregulated genes and provide a global view of molecular processes involved in CVDs. This helps to identify signaling pathways and mechanisms contributing to disease development and progression. Merging multiple microarrays has advantages, including increasing sample size and statistical power, improves generalizability of findings, and reduces impact of technical variability and batch effects. This enables the identification of more reliable gene expression patterns across samples. Heart failure(HF) is a common and life-threatening condition affecting millions worldwide. Over the years, different ways have been explored to better understand the underlying mechanisms of HF and develop effective treatments. When it comes to HF, microarrays can be instrumental in identifying key genes/pathways involved in disease's development and progression. This work applies multivariate analysis after data-merging and batch correction of six curated microarray datasets of HF to identify its global signature.

Methods: Gene expression datasets related to HF were retrieved from GEO repository. This included 6 datasets comparing heart tissue of patients with HF and healthy samples, yielding a combined dataset of 108 HF and 47 controls, and 1019 features. Statistical analysis was performed in R, including batch correction using Combat method to account for non-biological variation resulting from different analysis settings, followed by data normalization. PCA and OPLS-DA were utilized for data exploration to uncover a HF gene expression profile. Discrimination between healthy and HF samples was attained and validated by bootstrap.

Results: Models exhibited good discriminatory ability, with Q2=0.68 and a median bootstrapped Q2=0.59. Genes with a median VIP and 95% confidence interval (computed from bootstrapped models)>1 were considered relevant. Of the 61 genes identified, 24 exhibited gene-disease association score (fetched from DisGenet Database)>0.1. Of these, 9 genes linked to CVD, 8 with nervous system diseases, 7 with mental disorders, 7 with respiratory tract diseases, 5 with immune system diseases, 5 with digestive diseases, 4 with nutritional/metabolic diseases, and 2 with hemic/lymphatic diseases.

Conclusions: Overall, the study identified a global signature for a multi-etiological HF group. Some of the findings indicate the influence of inflammatory/immune systems in HF. This signature may be valuable for molecular HF studies stemming from different conditions. The study also underscored the importance of public repositories in facilitating data-merging studies.

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P12
That is the predictive value of ambulatory blood pressure monitoring (ABPM) in terms of future cardiovascular events for patients with resistant hypertension?

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Background: Arterial hypertension (AH) is a major risk factor for Cardiovascular (CV) disease. The most severe outcomes are associated with resistant hypertension (RH), which has an estimated prevalence of 10–18% among patients receiving treatment for AH. Due to the heightened risk of CV events associated with RH, accurate CV prognosis is crucial. According to the European Society of Cardiology, RH should be confirmed by ambulatory blood pressure monitoring (ABPM) or home blood pressure monitoring (HBPM). ABPM is mandatory for RH diagnosis, but its use for prognosis is limited. This study aimed to identify the predictors of future CV events when diagnosing RH through ABPM.

Methods: This retrospective observational longitudinal study involved 258 patients, with a mean age of 60.4 ± 11.2 years and 61.2% male. The patients underwent 24-hour ABPM between 1999 and 2019. All patients included in the study had a mean systolic blood pressure (SBP) of ≥130 mmHg on ABPM, or SBP ≥135 mmHg during the daytime while taking the highest tolerable doses of at least three antihypertensive agents, including a diuretic. Alternatively, they had controlled blood pressure with four or more antihypertensive agents. The primary outcomes of the study were global cardiovascular events, which included cerebrovascular, coronary, and other cardiovascular events. The mean follow-up period was 6.0 ± 5.0 years.

Results: Sixty-eight CV events were recorded, of which 63 were non-fatal and 5 were fatal. Patients who experienced these events were generally older, with chronic kidney disease and prior CV events. The study found that an increment of 1 standard deviation in 24-hour systolic blood pressure, night systolic blood pressure, and 24-hour pulse pressure were independent predictors of global cardiovascular events, with respective hazard ratios (HRs) of 1.44 (95% confidence interval [CI] 1.10-1.88), 1.35 (95% CI 1.01-1.80), and 1.39 (95% CI 1.02-1.89). In addition, patients with a pulse pressure > 60 mm Hg of 24 hours, daytime, and nighttime, analyzed as a categorical variable, had a significant HR related to future cardiovascular events in a multivariate Cox analysis, with respective HRs of 1.95 (95% CI 1.01-3.45), 2.15 (95% CI 1.21-3.83), and 2.07 (95% CI 1.17-3.67). Kaplan Meier survival analysis of 24-hour pulse pressure, daytime, and nighttime > 60 mmHg showed a worse CV outcome (Log Rank <0.05).

Conclusion: In conclusion, ABPM-based RH diagnosis was deemed crucial and is a fundamental tool not only for the diagnosis of resistant hypertension, but also for predicting future cardiovascular events.

P13
STOP-Bang questionnaire as a screening tool for obstructive sleep apnea syndrome in the bariatric population: a meta-analysis

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Keywords: bariatric surgery, meta-analysis, sleep apnea, STOP-Bang

Introduction: As in the general population, obstructive sleep apnea syndrome (OSAS) is underdiagnosed in the bariatric population. Undiagnosed patients are subject to a higher incidence of postoperative cardiopulmonary complications, hence the importance of evaluating these individuals before bariatric surgery. To identify patients at high risk of OSAS, a meta-analysis was performed to determine the best cutoff point of the STOP-Bang questionnaire for this population.

Methods: A literature search in MEDLINE and The Cochrane Library databases was conducted on October of 2022, using "bariatric surgery", "sleep apnea" and "STOP-Bang" as keywords. The objective was to identify published articles, in which the STOP-Bang questionnaire was applied as a screening tool for OSAS in patients selected for bariatric surgery and in which a sleep study was performed to confirm the diagnosis. All the articles that were able to provide enough data to construct a two-by-two table directly or by calculation were included in the meta-analysis. A linear mixed effects model was applied to obtain pooled sensitivity, specificity, and positive and negative predictive values, considering different STOP-Bang score thresholds. Additionally, the optimal threshold for the data included in the meta-analysis was determined, through maximization of the Youden index. The meta-analysis was performed with R Studio (version 4.0.2), using {meta} and {diagmeta} packages.

Results: Eight studies met the inclusion criteria for the systematic review, representing a OSAS prevalence between 37% and 91%. The global prevalence of moderate/severe and severe OSAS was 21% and 35%, respectively. The combined sensitivity and specificity for an estimated optimal cutoff of 4.6 to predict moderate/severe OSAS was 67% and 73%, respectively. To predict severe OSAS, the estimated optimal cutoff was 5.2. The corresponding combined sensitivity and specificity were 66% and 76%, respectively. The STOP-Bang questionnaire presents good diagnostic accuracy for both disease severities, obtaining an AUC = 0.762 for moderate/severe OSAS and an AUC = 0.768 for severe OSAS.

Conclusion: This meta-analysis, despite including a reduced number of studies (< 10), confirms that the STOP-Bang questionnaire is an effective tool to identify patients at moderate to severe risk of OSAS among candidates for bariatric surgery. According to the study carried out and the number of articles included, it was concluded that the ideal cutoff point for OSAS screening, using the STOP-Bang questionnaire, is a score ≥ 5. Our results are in accordance with the Portuguese Society of Anesthesiology guidelines, which recommend a cutoff ≥ 5 for bariatric population.

P14
Brain Protection Strategies In The Surgical Treatment Of Acute Type A Aortic Dissection And The Occurrence Of Intraoperative Brain Damage - A Systematic Literature Review and Meta-Analysis

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Keywords: Aortic dissection, brain and cerebral, cardiac anesthesia, cardiac surgery, protection,.

Introduction: Aortic dissection is a rare but deadly clinical entity. Surgical treatment should be performed expeditiously in the absence of contraindications. Cardiac arrest is mandatory and brain compromise is a concern, due to insufficient blood supply. Several strategies try to mitigate this risk, namely brain reperfusion and hypothermia. However, the literature is still unsatisfactory in identifying which procedures have the best neurological outcomes. Our work attempts to review which strategies have the best neurological impact.

Methods: We systematically reviewed the articles found in PubMed, written in English, between 1/1/1960 and 11/23/2022, using the keywords cardiac surgery, cardiac anesthesia, aortic dissection, protection, brain and cerebral. We included all articles that provided a comparative analysis of brain damage events with the use of at least two different brain protection techniques. The compared protection strategies were: retrograde cerebral perfusion (RCP) vs. antegrade cerebral perfusion (ACP); RCP vs. deep hypothermic hypothermia with no-cerebral perfusion (DH); ACP vs. DH; unilateral ACP (uACP) vs. bilateral ACP (bACP); DH (<28°C) vs. moderate hypothermia (MH, 28°C-32°C); low hypothermia (<24°C) vs. high hypothermia (≥ 24°C). And the assessed neurological outcomes were: incidence of temporary neurological damage (TND), permanent neurological damage (PND) and stroke.

Results: The obtained forest plots regarding the effect of different protection strategies on the occurrence of cerebral events are demonstrated in figure 1 (supplementary. material). Overall, there are no statistically significant differences in the outcomes, regardless of the strategy used. Only MH was associated with a lower stroke rate when compared with DH (OR 1.19, 95% CI 1.02-1.38, I2 = 0%).

Discussion: Given the high morbidity and mortality associated with surgical repair of the aorta, it is essential to understand which brain protection strategies are associated with better clinical outcomes. This meta-analysis does not provide unequivocal clarification of the clinical advantages of the mentioned techniques. This may be due to the absence of systematic and universal approaches, classifications and endpoints, which may hinder a legitimate comparison between the results of different authors. Additionally, more research and randomized trials are needed to aggregate knowledge in the field. Nevertheless, the lack of a disproportionately beneficial strategy lightens any pressure to adopt new and sophisticated techniques, reinforcing the confidence of professionals in the practices with which they are most familiarized.

Conclusion: This meta-analysis showed that during surgical repair of acute aortic dissection, there is not a clearly advantageous brain protection strategy to reduce neurological events. Only MH seems to be protective against stroke, compared to DH.

Supplementary material: Available online

P15
Perceived health status of patients in a hyperbaric medicine unit in the north of Portugal

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Keywords: hyperbaric oxygen therapy; health status, mediation analysis

Background / Objectives: Hyperbaric oxygen therapy (HBOT) consists of the administration of pure O2 in a high-pressure environment. In Europe, the application of this treatment is based on recommendations from the European Committee on Hyperbaric Medicine. The aim of this study was to analyze the self-reported health status at the time of the first session by patients who underwent HBOT.

Methods: An observational study was carried out at the hyperbaric medicine unit of Matosinhos Local Health Unit. Data were obtained from patients who underwent HBOT sessions between 2021 and 2022 regarding sociodemographic variables (gender and age), the motive for treatment, and health status assessed using the EQ-5D-5L. This questionnaire consists of six questions, assessing five dimensions (Mobility, Self-care, Usual activities, Pain/Discomfort, Anxiety/Depression) measured on a five-point scale, and general health status measured between 0-100 points on a visual analog scale (VAS). The results of each domain were transformed based on norms for the Portuguese population. Data exploration included descriptive statistics, Spearman's correlation coefficient evaluation, Mann-Whitney test, and mediation analysis.

Results: Of the 452 patients (50.9% male), the mean age was 55.6±15.5 years. The average health status score was 0.887±0.177 (min-max: -0.205-1.000), with 65.5% of patients reporting problems in at least one of the dimensions. The frequency of signaling problems, by domain, was Mobility 25.2%, Self-care 11.7%, Usual activities 31.0%, Pain/Discomfort 40.0%, and Anxiety/Depression 42.5%. The average for general health status measured through the VAS was 72.7±19.5. A low but statistically significant association was found for self-reported health status and age (EQ-5D-5L Spearman's rho=-0.129, p<0.05; VAS Spearman's rho=0.180, p<0.001). A statistical difference in health status was also found for sudden deafness and all other treatment motives (EQ-5D-5L, 0.925±0.114 vs 0.802±0.251 p<0.001; VAS 75.8±18.6 vs 66.1±19.7, p<0.001). Mediation analysis to assess the mediating rol of age in the relationship between the motive for treatment and EQ-5D-5L scores revealed a significant indirect effect of the motive for treatment on health status scores through age (β=0.014, CI95% [0.005-0.027], p<0.05). The total effect of the motive for treatment on EQ-5D-5L scores was significant (β=0.122, CI95% [0.081-0.172], p<0.05).

Discussion / Conclusion: At the time of the first session of HBOT, most patients report problems in their health status, with the assigned value being negatively influenced by increasing age. Patients with sudden deafness report better health status indicators but those are mediated by age.

P16
Relevance of testing proportional hazard assumption in Cox Regression - Sex differences in long-term survival after coronary artery bypass grafting

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Introduction: Data about the impact of sex on survival after coronary artery bypass grafting (CABG) have been conflicting and mainly focused on first 5-years of follow-up (FUP). Cox analysis is the most commonly survival analysis method used in clinical research and testing its proportional hazard (PH) assumption should be emphasised.

Aims: To compare long-term survival after CABG between women (W) and men (M) using Multivariable Cox Regression.

Methods: Longitudinal, retrospective, single-center study including a random sample of 150 W and 150 M who underwent first isolated CABG between 2004 and 2014. Al -causes mortality was checked on December 2022 and studied using Kaplan-Meier (KM) Curves, Log-Rank test and multivariable Cox Regression with and without split analysis. Median FUP was 11 years and the maximum 19 years. PH assumption was verified using KM curves examination and Schoenfeld's tests. "Survival" package of R software version 4.1.2 was used for this analysis.

Results: From 3894 consecutive patients who underwent first isolated CABG during the study period, 80% were men. The random sampling of 300 patients evidenced that W were older (median 68 vs 64 years, $p<0.01$) and had higher incidence of arterial hypertension (87% vs 70%, $p<0.01$), diabetes (55% vs 39%, $p<0.01$), obesity (35% vs 20%, $p<0.01$) and renal disease (70% vs 55%, $p<0.01$). M had more often peripheral arterial disease (23% vs 9%, $p<0.01$) and active smoking habits (22% vs 4%, $p<0.01$). At 5-, 10- and 15-years of follow-up, W vs M presented cumulative survival of 88% vs 90%, 70% vs 70%, and 42% vs 56%, respectively (Log-Rank test, p=0.25). KM curves evidenced that the hazard of sex is not proportional overtime, which was confirmed by a trend for non-proportionality using Schoenfeld's test (p=0.076 for sex variable). The overall multivariable Cox regression model evidenced no differences for sex (HR: 0.97, 95%CI: 0.66-1.43, p=0.89), but the split analysis at 10-years of FUP showed that sex impacts for patients who reached 10-years of FUP. Women have worse survival outcome (HR: 2.0, 95%CI: 1.02-4.10) than men after 10-years of FUP, while no effect of sex was evidenced in first 10-years of FUP (HR: 0.77, 95%CI: 0.49-1.20).

Conclusion: Women have similar outcomes to men during early and mid-term follow-up, but worse survival results after 10-years of follow-up, evidenced by split analysis. The impact of time-varying coefficients should be carefully addressed to adequately choose the statistical methodologies and to improve the interpretation of results.

P17
Exploring the impact of sex differences on atrial fibrillation recurrence after catheter ablation using a data-driven approach

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Keywords: Atrial Fibrillation, Catheter Ablation , Cox regression, Hazard Proportionality, Risk of recurrence, Schoenfeld residuals, Sex, Split Analysis, Women

Background/Objectives: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia in adults. Some patients undergo catheter ablation (CA) to restore and maintain sinus rhythm, although for many AF will recur after procedure. While the recurrence rate of AF after catheter ablation tends to be higher in women, the impact of sex on time to AF recurrence after CA remains unclear. We aimed to evaluate the effect of sex AF recurrence after CA.

Methods: Single-center retrospective study that included all patients who underwent a first procedure of AF CA between 2017 and 2021. Late recurrence (LR) was defined as any AF recurrence after a 90-day blanking period post-CA. The effect of sex on the cumulative freedom from LR was estimated using the Kaplan-Meier method and compared using the log-rank test and Cox proportional hazards model, adjusted for clinically relevant characteristics (age, body mass index (BMI), persistent AF, hypertension, thyroid disfunction and dilated left atrium). Proportional hazard assumption of the Cox model was tested using Schoenfeld residuals.

Results: A total of 656 patients were included in the analysis, 32% of whom were women. Median follow-up after catheter ablation was 27 months (minimum 6, maximum 68). Compared to men, women who underwent catheter ablation were older (median age 62 vs. 56 years), had higher BMI (median 27.9 vs. 27.1 kg/m2), and higher prevalence of hypertension (54% vs. 45%), thyroid dysfunction (28% vs. 10%) and valvular disease (15% vs. 8.4%). After covariate adjustment, women had a higher risk of LR (hazard ratio [HR] 1.67, 95% confidence interval [CI] 1.18-2.36; p = 0.04). However, Kaplan-Meier curve showed that sex-related effect was not proportional over time, confirmed by Schoenfeld test (p = 0.025), and that HR diverged after 1-year follow-up. A reanalysis after a time split at 1-year follow-up showed that women had a higher risk of LR after 1-year from catheter ablation (HR 2.53; 95% CI 1.56 – 4.12; p <0.001), but not within the first year after the procedure (HR 1.43; 95% CI 0.97 – 2.11; p = 0.072). Persistent AF was also an independent predictor of LR (HR 2.00; 95% CI 1.42 – 2.83; p <0.001).

Conclusions: Recurrence of AF following CA is more frequent in women 1-year after procedure. Sex did not impact AF recurrence within the first year after CA. These findings highlight the need to unveil the physiological and biological processes leading to late AF recurrence and its sex-dependent association.

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P18
Lipidomic profiling of HFpEF patients for the stratification of cardiovascular risk

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Keywords: Cardiovascular Risk, Cox Regression, C-index, Hazard Ratios, Heart Failure, Plasma Lipidomics

Introduction: The role of plasma lipids is well-established in cardiovascular diseases (CVD). Lipids may contribute to the development and progression of HFpEF by increasing inflammation and impairing the ability of the heart to relax and fill with blood. Still, a comprehensive evaluation of the plasma lipidome in patients with Heart Failure with preserved Ejection Fraction (HFpEF) is missing, predominantly for cardiovascular risk stratification.

Methods: In this study, we profiled the plasma lipidome of patients with stable HFpEF (n=60, single center and prospective cohort) using top-down shotgun lipidomics. A total of 105 lipids were measured, normalized to their total sum (to reduce bias between subjects), log-transformed (to reduce skewness) and standardized (to give the same importance to all lipids). The primary endpoint was a composite of cardiovascular death or hospitalization due to HF or acute HF episode. Clinical data (age, sex, estimated glomerular filtration rate (eGFR), BNP and use of statin) was condensed through principal component analysis (PCA) into a single score (PC1) for regression adjustment. The association between each plasma lipid and a cardiovascular event was explored through Cox regression analysis, adjusted to the clinical data score (PC1). Models were internally validated with bootstrapping (resampling with repetitions, recomputed 300 times). All hazard ratios (HR), p-values and c-index were recovered.

Results: For a median follow-up of 39 months (maximum 59 months), 21 patients registered an event. A significant association was found and corroborated with bootstrapping for 11 lipids (7 phosphocholines (PC), 1 phosphoethanolamine (PE), 1 phosphatidylinositol (PI), 1 sphingomielin (SM), and 1 cholesterol ester (CE) and the primary endpoint event in our population. Lipids positively associated with the events were: PE18:0-18:2 (median HR of all bootstrapped models 2.02 [95% confidence interval 1.27-3.54]), PC18:0-22:5 (HR: 1.98 [1.37-3.3]), PC14:0-18:1 (HR: 1.85 [1.13-3.31]), PI18:0-18:2 (HR: 1.84 [1.11-3.61]), PC16:0-17:1 (HR: 1.74 [1.00-3.33]), PC(O)16:2-18:0 (HR: 1.69 [1.03-3.04]), PC16:0-16:0 (HR: 1.67 [1.03-2.55]), PC16:0-22:5 (HR: 1.65 [1.18-2.46]), PC18:0-20:3 (HR: 1.62 [1.00-2.68]), while negative associations were found for SM42:1:2 (HR: 0.60 [0.40-0.90]), and CE20:4 (HR: 0.58 [0.38-0.99]). Median c-index ranged from 0.65 to 0.71, showing moderately robust predictive models.

Conclusion: Despite the small cohort and the low number of events, we identified lipids potentially associated with poor cardiovascular outcomes. These preliminary results revealed that plasma lipidomic might help stratify patients at risk of cardiovascular death, HF hospitalization, and acute HF episodes.

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P19
Assessing the prognostic value of metabolites in patients with Heart Failure: a systematic review and meta-analysis

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Keywords: cardiovascular risk, heart failure, meta-analysis, metabolomics

Introduction: While the association of plasma lipids and the risk of poor cardiovascular (CV) outcomes are known, other plasma circulating metabolites might add value to the prognosis of CV-associated events. Metabolomics may help uncover metabolic dysregulations underlying such associations.

Aim: To compile risk associations between metabolites and poor CV outcomes in patients with Heart Failure (HF) through a systematic review and meta-analysis.

Methods: We performed a systematic review using the Medline and PubMed database (last searched on 31/12/2022). Studies that used blood (plasma or serum) metabolomics in HF patients to predict poor cardiovascular outcomes (death or hospitalization due to worsening of HF), irrespective of follow-up time were included. Time-to-event outcomes were collected for each metabolite through adjusted Hazard Ratio (HR) along with its uncertainty. Fixed and random effects models were used to compute statistical combined measures (HR) and 95% confidence intervals (CI) of individual metabolites.

Results: We identified 69 studies that used metabolomics in patients with HF. Of these, 5 articles, totalizing 2076 patients from 6 independent cohorts, computed and reported the HR of 129 metabolites (*log-transformed and standardized*). Forty-five metabolites were present in at least two studies/cohorts and assessed through meta-analysis. The mean (or median) follow-up period ranged from 1.0 to 6.3 years, and the rate of events ranged from 13-38% of the included sample (n varying from 136 and 516). We identified 8 metabolites with a significant pooled HR and low heterogeneity (I2< 50%) using fixed- and random-effect models. Higher histidine (HR: 0.74 95%CI [0.64-0.86]) and tryptophan (HR: 0.82 [0.71-0.96]) seem to be protective of CV events, while higher symmetric dimethylarginine (SDMA) (HR 1.58 [1.30-1.93]), N-methyl-1-histidine (HR: 1.56 [1.27-1.90]), SDMA/arginine (HR: 1.58 [1.14-1.68]), putrescine (HR: 1.31 [1.06-1.61]), methionine sulfoxide (HR: 1.26 [1.03-1.52]) and 5-hydroxylysine (HR: 1.25 [1.05-1.48]) were associated with a higher risk of events. Of these findings, tryptophan and histidine were reported in 3 studies/cohorts, while the remaining metabolites were reported in 2.

Conclusions: Despite the limited data available, we identified 8 metabolites associated with CV events in patients with HF, suggestive of derangement in inflammatory processes and in the nitric oxide synthesis pathways that need further exploration. The lack of standardization in metabolomic studies and data reporting hampers combining and comparing different studies. Taking metabolomics into a clinical scenario, in the long run, could greatly benefit from harmonizing analytical analysis procedures and adopting open data-sharing policies.

Acknowledgements: This work was financed by the European Regional Development Fund (ERDF) through the North Regional Operational Program in the framework of the project HEALTH-UNORTE: Setting-up biobanks and regenerative medicine strategies to boost research in cardiovascular, musculoskeletal, neurological, oncological, immunological and infectious diseases (NORTE-01-0145-FEDER-000039); "New targets in diastolic heart failure: from comorbidities to personalized medicine – NETDIAMOND" financed by the European structural and investment Funds (ESIF), through the Programa Operacional Regional Lisboa 2020 (POCI-01-0145-FEDER-016385) and national funds by FCT – Portuguese Foundation for Science and Technology (SAICT-PAC/0047/2015), FCT under the scope of the Cardiovascular R&D Center – UnIC (UIDB/00051/2020 and UIDP/00051/2020) and CardioNIR: CARDIOvascular Near-InfraRed spectroscopy probing (PTDC/EMD-EMD/3822/2021).

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P20
Decoding The Genetic Architecture Behind Disease Heterogeneity: A Genome-Wide Association Study And Cluster Analysis In COPD

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Background: Pulmonary, as well as extrapulmonary features such as muscle weakness and reduced exercise capacity, contribute significantly to the morbidity and mortality as well as the individual, social and economic burden of chronic obstructive pulmonary disease (COPD). Aetiology is multifactorial, including extrinsic factors such as smoking, inactivity, malnutrition and corticosteroid use, as well as intrinsic factors such as hypoxia, hypercapnia, inflammation and oxidative/nitrosative stress. Evidence suggests single-nucleotide polymorphisms (SNPs) may be involved in muscle wasting and other pathophysiological processes. A known genetic predisposition to functional impairment could therefore be useful in optimising the treatment of this meaningful patient-centred health domain. Hence, we conducted a cluster analysis and genome-wide association study (GWAS), to identify genetic variants associated with functional impairment in individuals with COPD.

Methods: A cross-sectional study was conducted. Exercise capacity was assessed with the one-minute sit-to-stand test and the six-minute walk test. Peripheral muscle strength was measured by handgrip strength and quadriceps maximum voluntary contraction. Hierarchical cluster analysis (Ward method) based on principal component analysis (PCA)-transformed data was used to classify patients. A PCA was performed to reduce the correlation between the independent variables. GWAS was performed using multivariate logistic regression with cluster assignment as phenotype, adjusted for age, sex, body mass index, smoking status and FEV1 %predicted. An additive model was assumed with a significant SNP p-value threshold of 5x10-8 and a suggestive SNP p-value threshold of 5x10-5 to account for multiple testing. Functional annotation was performed using FUMAGWAS. All statistical analyses were performed with PLINK 1.9 and R statistical software.

Results: We included 208 patients with COPD (68±8 years old; 21% female; FEV1 53 [40, 67] %predicted), of whom a subset of 170 had genotyping data available. Cluster 1 (n=66) was characterised by younger, mostly male individuals with fewer symptoms and preserved exercise capacity and strength. Cluster 2 (n=96) was intermediate between the other two clusters in terms of patients' clinical and demographic characteristics, with preserved functional capacity but decreased strength. Cluster 3 (n=46) was characterised by older, symptomatic patients with a higher prevalence of women, reduced exercise capacity and muscle weakness. Six SNPs were found to be suggestive from GWAS and mapped to genes previously associated with inflammation and muscle wasting mechanisms.

Conclusion: These results suggest that functional impairment in COPD may be influenced by genetics, as individuals with polymorphisms in the mapped genes were at increased risk for functional impairment.

P21
Low versus High-resource Pulmonary Rehabilitation Settings in COPD: A Retrospective, Propensity Score-Matched, Non-Inferiority Study

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Keywords: COPD; Pulmonary Rehabilitation

Background: Pulmonary rehabilitation (PR) is crucial for the management of people with chronic obstructive pulmonary disease (COPD) with well-established physical, psychological and social benefits. Access to PR is, however, limited. Implementing PR with minimal resources is being considered to increase its availability. Nonetheless, the effectiveness of this approach is unclear. This study aimed to assess whether PR for COPD in low-resource was non-inferior to high-resource settings.

Methods: A retrospective study with people with COPD who participated in PR programs was conducted. Programs delivered at the Respiratory Research and Rehabilitation Laboratory, School of Health Sciences of the University of Aveiro (Lab3R-ESSUA) or at hospital outpatient departments were classified as high-resource settings. PR programs conducted at city council facilities or primary healthcare centres were deemed low-resource settings. Outcomes of interest were change in functional exercise capacity assessed with the 6-minute walk test (6MWT), disease impact with the COPD assessment test (CAT) and health-related quality of life with the St. George Respiratory Questionnaire (SGRQ). The minimal clinically important differences for 6MWT ($\geq$ 25m), CAT ($\leq$ -2units) and SGRQ ($\leq$ -4 points) were defined as the non-inferiority margins. Samples were matched using logistic regression-based propensity-score adjusted for sex, age, body mass index, lung function, smoking status, dyspnoea severity, and baseline values for all outcomes at a 1:1 ratio with nearest neighbour matching and a caliper of 0.2. Covariate balance was assessed using standardized mean differences (SMD). Settings were compared using chi-square test, Fisher's exact test, independent t-test, or Mann–Whitney U test, as appropriate. A two-sided 95% confidence interval (CI) between-group differences was constructed to evaluate non-inferiority. Statistical analyses were performed in R software.

Results: A total of 150 people with COPD completed PR. After matching, 102 people were included in the analysis, 51 in each setting. No significant differences were found in baseline characteristics (P>0.05) and all SMDs were less than 0.1, indicating good covariate balance. No significant differences were observed between settings in pre-post change for any of the outcomes (P>0.05). Non-inferiority of the low-resource settings compared with the high-resource settings was demonstrated only for the 6MWT [mean difference between low and high-resource settings (95%CI), 6.6 (-19.73; 32.93)], being inconclusive for CAT and SGRQ.

Conclusion: PR with minimal resources seems to be non-inferior to high-resource PR in terms of functional exercise capacity in COPD. Other matching methods are being explored to minimise sample size loss and strengthen our results.

P22
Evolution of the risk perception of infection by COVID-19 – Evidence from the COVID-19 Barometer: Social Opinion

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Keywords: COVID-19, coronavirus, longitudinal study, pandemic, risk perception, survey

Since the beginning of the COVID-19 pandemic, several non-pharmaceutical interventions (NPI) have been adopted worldwide in an attempt to keep the growing transmission of the virus under control. Several factors might influence the effectiveness of NPI. This study aimed to evaluate the evolution of the perception of the risk of infection by COVID-19 in Portugal between March 2020 and March 2022, and to identify associated factors. We used the "Covid-19 Barometer: Social Opinion" barometer, which was launched at the beginning of the pandemic in Portugal to identify and monitor the evolution of the Portuguese population's perception of the pandemic and its impact on daily life and was online during two years. We also considered COVID-19 incidence, stringency data, COVID-19 variants' prevalence and Google searches on COVID-19.The outcome considered was the perceived risk of infection by COVID-19, which was classified into low versus high/moderate. The explanatory variables from the Barometer were grouped into dimensions: general factors (socio-demographic and health-related variables), adherence to protection measures, vaccine hesitancy and coping mechanisms.Considering the nature of this study and the outcome variable, generalized linear models were used to study the temporal evolution of the considered variables – in particular, mixed effects logistic regressions. One model was fit per group of variables/dimension. Preliminary results show that, linked to a higher risk perception are lower levels of education, poor health status and working full-time at the workplace (as opposed to remote working) – the last two with a growing tendency over time. On the other hand, individuals with a previous COVID-19 diagnosis and a better mental health status are more likely to perceive lower risks, a propensity that diminishes over time. Students and unemployed individuals are also more likely to have a lower perception of risk, when compared to employed individuals of the same age and sex. Additionally, there is in general a higher probability of perceiving a lower risk of infection as time progresses.

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P23
Relationships between WAI, BriefCOPE and COPSOQII scales on health care professionals: a multivariate analysis

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Keywords: Health professionals, WAI, BriefCOPE, COPSOQII

Background/Objective: Individual health and organizational performance are strongly influenced by how people manage stress, or how they cope. Analysis and understanding of bidirectional association of BriefCOPE and COPSOQII and a unidirectional association of these two with "Índice de Capacidade para o Trabalho (ICT)", a Portuguese version of Work Ability Index (WAI) in a health care professionals (e.g. Physicians, Nurses…) database (incomplete cases: n=909, complete cases: n=652).

Methods: The Brief-COPE is a 28 item self-report questionnaire designed to measure effective and ineffective ways to cope with a stressful life event. The psychosocial factors of work were evaluated using the COPSOQII. This questionnaire comprises 76 items divided into 29 scales. The WAI assesses the work ability, considering their health status, physical and mental demands, and work-related resources. To explore the association between Sociodemographic variables, BrieCOPE and COPSOQII with WAI, the chi-squared test (for categorical variables) and the Kruskal-Wallis test (for quantitative variables) were applied. Exploratory Factorial Analysis (EFA) and Confirmatory Factorial Analysis (CFA) methods to determine the model structure and fitness were also used.

Results: The WAI classification for the health care professionals was: poor/moderate (n=123; 18.9%), good (n=349, 53.5%), excellent (n=180, 27.6%). The sociodemographic variables showed no significant association with WAI categories. For the BriefCOPE scale, significant results were found with WAI categories in 8 of 14 dimensions (e.g active coping, denial, and substance use). For the COPSOQII scale, significant results were found with WAI categories in 28 of 29 dimensions (e.g work pace, burnout, and bullying). By EFA, the best model of BriefCOPE (oblimin rotation) with 4 dimensions was obtained, explaining in total 55% of the data variance. The best resulting model for COPSOQII, composed of 7 dimensions (varimax rotation), explains 63% of the total variance. These best models were used to be compared to the respective CFA. The results for the CFAs were not satisfactory given that the CFI and TLI indices were not good.

Conclusions: The main conclusion is that the fitting of the models does not have good results, even considering the models proposed by EFA. This might be explained due to the aggregation of all heath care professionals since different types of healthcare professionals have different work environments and demands.

P24
What proportion of women refers moderate to severe pain during office hysteroscopy with a mini- hysteroscope? A systematic review and meta- analysis

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Introduction: Mini-hysteroscopy is an invasive exame, which many authors believe to be painless or, at least, a bearable experience and therefore is usually performed without analgesia or anaesthesia. Is it as tolerable as the articles and authors suggest? 2 meta-analyses published in 2020 by De Silva established pain as a problem in office hysteroscopy and forwarded data suggesting that both analgesia and local anaesthesia can reduce discomfort. The main objective of our study is to estimate the proportion of women who report moderate to severe discomfort during the examination with mini-hysteroscope.

Methods: Online sources were searched with keywords "hysteroscopy" and "pain" from 2000 to December 2014. We found 35 articles randomized controlled trials (RCT) and well-designed prospective trials (PT), studying pain as main outcome in office mini- hysteroscopy. Studies where conscious sedation, anaesthesia or non-steroidal drugs were used were excluded. Data collected was the number of women referring moderate to severe pain compared to total women with intervention in the study. Authors were contacted to try to retrieve unpublished data for analysis. We performed a meta- analysis from eight studies (6 RCT and 2 PT) and 1761 women were included.

Results: A meta-analysis estimated the pooled prevalence of pain [(greater than 3 to 10 on 10cm Visual Analogue Scale (VAS)] for all studies and by two subgroups: (I) RCT and (II) PT. Due to significant heterogeneity between studies, we used the random- effects model. The overall estimated prevalence of pain is 31% (95% CI 0.14– 0.50). Even when considering Jensen's definition of moderate pain, (we used VAS greater than 5, well above his proposed threshold of 4.4 mm) prevalence of pain is still surprisingly high for such a strict limit, giving an overall non-negligible value of 13% (95% CI 0.05–0.24).

Discussion and Conclusions: Mini-hysteroscopy remains painful for at least 13% of women if cut-off for moderate pain is set at VAS ≥5 but it reaches 31% if cut-off switches to a more consensual value of VAS ≥4. From evidence gathered, mini-hysteroscopy may not be as painless as previously thought. Limitations of this study include difficulty in obtaining accurate figures from original articles. Investigation on ways and techniques to alleviate pain in hysteroscopy should continue.

P25
Fetal hemoglobin Level Impact on the Clinical and Laboratory Profile of SCA Patients

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Key words: Fetal Hemoglobin, Sickle Cell Anemia, Clinical and Laboratory Data

Sickle cell anemia (SCA) is a hemolytic disease characterized by production of sickle hemoglobin (HbS). It is one of the commonest types of hemoglobinopathies and also the one the most severe monogenic disorders in the world, especially in Sub-Sahara African region. Fetal hemoglobin (HbF) levels have been identified as a potential modulator of this SCA severity. The aim of this study was to evaluate the impact of HbF on the clinical and laboratory profile of patients with sickle cell anemia. A total of 33 sickle cell anemia patients, undergoing treatment at Hospital Agostinho Neto in Cape Verde, were included in the study. Clinical data were collected through the questionnaire while laboratory results were obtained by analyzing blood samples that were collected from the participants. A descriptive analysis was performed using absolute and relative frequencies for qualitative variable, mean and standard deviation or median and interquartile range for quantitative variables. The linear regression model was performed to investigate the influence of HbF level on clinical and laboratorial outcomes. The findings of the regression analysis demonstrated a significant correlation between HbF levels and variables such as hemoglobin (Hb), Red Cell distribution width (RDW), white blood cells (WBC), and body mass index (BMI). This suggests that higher HbF values may have a positive impact on the laboratory profile and overall health of these patients. However, no association was observed between clinical complications and HbF levels.

P26
Effectiveness of neural mobilization techniques in decreasing pain and improving function in people with low back and neck pain: a systematic review with meta-analysis

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Key words: physical therapy modalities, neurodynamics, low back pain, neck pain, functional status

Introduction: Low back and neck pain are the most prevalent among musculoskeletal conditions with a high impact on the functionality of people who suffer from these conditions[1]. One physical therapy modality that has been used to manage musculoskeletal pain is neural mobilization (NM) techniques. Thus, the aim of this systematic review was to synthesize up-to-date evidence on the effectiveness of using NM to treat pain in adults with low back and neck pain without neurological deficits.

Methods: A systematic review with meta-analysis of studies involving adults with low back (LBP) and neck pain (NP) was performed. Randomized and quasi-randomized studies were included. The following databases were searched: PubMed, Web of Science, CINAHL, MEDLINE, Scopus, CENTRAL, and PEDro. Clinical trial registries and the Open Access Scientific Repositories in Portugal were also consulted. The outcomes of interest were pain and function. Risk of bias assessment was performed using the RoB 2 tool. The certainty of evidence was assessed using the GRADE approach. Subgroup analyses were performed to explore heterogeneity between trials. Publication bias was investigated using funnel plots and Egger and Begg tests. Trim and Fill Method was used to trim the studies responsible for asymmetry in the funnel plot. P-curve analysis was also used to assess selective reporting in individual trials.

Results: Fifteen studies were included for LBP [2-16] and eight for NP. For LBP [17-24], there was a significant effect favouring the NM for pain (k=10) (ES = -1.36 [95%-CI -2.32; -0.40) and function (k=9) (ES = -1.49 [95%-CI -2.16; -0.81). However, subgroup analyses showed that effectiveness remains significant only when NM is applied as part of multimodal interventions (ES = -2.03 [95%-CI -2.89; -1.18) and when applied through tensioning techniques (ES = -1.77 [95%-CI -2.31; -1.22). Similar findings were revealed for function. Funnel plot and the Egger and Begg tests were inconclusive regarding publication bias. The application of the Trim and Fill Method adjusted the global confidence interval for a non-significant effect (SMD = -0.79, [95%-CI -1.91; 0.32]). P-curve analysis did not point to any selective reporting on individual trials. For NP, there was a significant effect favouring NM only for pain intensity when the techniques were integrated into multimodal interventions (ES = -0.76 [95%-CI -1.39; -0.12). There was very low confidence in all effect estimates.

Conclusions: NM appears to have positive effects on pain and function in patients with low back and neck pain. More studies are needed.

Supplementary material: References Available online

P27
Bacterial co-infections in patients with COVID-19: a retrospective single center study.

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Keywords: COVID-19, bacterial co-infection

Background: The COVID-19 pandemic constitutes a challenge to healthcare systems worldwide, where bacterial co-infection emerged as a potential indicator of disease progression. Coinfection is a community-acquired infection diagnosed within 48h of hospital admission for COVID-19. However, there is a lack of understanding regarding its prevalence, incidence, and characteristics in COVID-19 patients. This study aimed to characterize the association between COVID-19 and bacterial infections in patients admitted to CHBV, Aveiro, Portugal, between March 2020 and December 2021.

Methods: This retrospective observational study was conducted on hospitalized patients in CHBV, between March 2020 and December 2021. COVID-19 confirmation was made using RT-PCR on respiratory samples, while microorganisms were identified using MALDI-TOF mass spectrometry. Entries with a COVID-19 test performed within 48h from the bacterial sample collection date and the first occurrence of each microorganism in 30 days were considered. Predictive multivariate binary regression models were created using the presence of COVID-19 infection, sex and age as predictive variables for the five identified microorganisms, and sensitivity analyses were performed to create outlier-free models. ROC curves were obtained and Odds Ratio and confidence intervals were calculated for each independent variable of the model.

Results: With a total of 7606 entries, 7,2% of patients had a bacterial infection and 3,1% of patients tested positive for COVID-19. Additionally, 0,3% of individuals met the specifications of bacterial coinfection, namely UTIs (39,1%) and wound infection (17,4%). The chi-squared test revealed a p-value of 0,471, meaning there is no evidence of association between bacterial and COVID-19 infections. The main identified microorganisms were Escherichia coli (16,1%), Klebsiella pneumoniae (15,0%), Enterococcus faecalis (8,1%), Staphylococcus epidermidis (7,5%) and Pseudomonas aeruginosa (6,5%). COVID-19 OR was not significant in all the univariate prediction models. Sex was significant in E. coli (OR=0.62), E. faecalis (OR=2.10), and S. epidermidis (OR=2.20) models, while age was significant in the E coli, K pneumoniae, E. faecalis, and P. aeruginosa models. The OR value was consistently 1.02.

Conclusion: Our results showed that 0,3% of our study population developed bacterial coinfections, the lowest value compared with other studies. In the context of COVID-19 infection, distinguishing bacterial colonization from infection presents as a challenge. We strictly defined co-infection as microbiologically proven. Most patients presented with respiratory symptoms and received empiric antibiotics, which could have influenced coinfection identification. This is a single-center experience, and our results may not be generalizable but should be compared with other institutions.

P28
Forecast model for Performance Indicators, a case of USF Arte Nova

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Keywords: Forecast; Health care unit; Performance Indicators

Background/Objectives: In recent years, Primary Health Care has been undergoing a reform that aims to transform it organisationally and allow greater proximity to communities and better service delivery. In this sense, there was the implementation of Performance Indicators whose objective is for the team of each unit to be able to understand where there are gaps in their service and be able to correct them based on the results of the indicators. Thus, this work aims to evaluate two methods of predicting an indicator in the short term so that, in the future, it can be applied to all indicators and help the unit teams.

Methods: This retrospective study was carried out with the monthly data of the indicator " 3 - Taxa de domicílios médicos por 1.000 inscritos" corresponding to the USF Arte Nova from January 2017 to July 2022 (67 months). Two methods were used to model the indicator for forecasting: time series analysis and interrupted time series analysis (intervention: month of the first case of COVID-19 confirmed in Portugal). Linear models with time, to explain the trend, and sinusoidal components, to explain seasonality, were used as independent variables. The models were trained with only the first 58 months to be able to assess the quality of the model's 9-month prediction compared to the original values of these months through error measures.

Results: Until approximately March 2020 the trend of the indicator is upward, becoming almost zero from that month onwards. The two models (uninterrupted and interrupted time series), in terms of coefficients, are relatively similar as well as their fit to the data (the adjusted R2 are 0.989 and 0.988 and the AIC are 177.2 and 180.5, respectively). When comparing the 9-month forecasts of both models with the original values, the uninterrupted time series model (ME (Mean Error)=0.87; RMSE (Root Mean Square Error)=1.48; MAE (Mean Absolute Error)=0.97; MPE (Mean Percentage Error)=4.64; MAPE (Mean Absolute Percentage Error)=5.27) proved to be more accurate than the interrupted time series model (EM=6.68; REQM=7.24; EAM=6.68; EPM=39.37; EPAM=39.38).

Conclusions: Having said this, in the specific case of this indicator the most appropriate model to use in the forecast is the model that does not consider the intervention, although visually we can identify a difference in behaviour in the month when the first case of COVID-19 was diagnosed in Portugal.

P29
Hypertensive Disorders in Pregnancy: Association Between Clinic and Ambulatory Blood Pressure and Adverse Pregnancy Outcomes

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Background: Hypertensive disorders are present in 5% to 10% of pregnancies, corresponding to the most frequent medical complication of pregnancy and a leading cause of maternal and perinatal morbidity and mortality world-wide. Blood pressure measurement plays a central role in the screening and management of hypertension during pregnancy. The conventional method of BP assessment is clinic blood pressure measurement, however, has been questioned for being a limited method once it is a one-off reading. On the other side, ABPM assesses blood pressure for 24 hours, allowing the assessment of circadian rhythm.

Methods: Retrospective and observational study that included 204 pregnant women diagnosed with gestational hypertension or hypertension before pregnancy, followed in the cardiology/hypertension appointment between January 2007 and June 2021. The maternal and perinatal outcomes were evaluated. To examine the relationship between clinic and ambulatory BP measurements and outcomes, Cox regression and Random Survival Forests models were applied.

Results: Gestational hypertension and chronic hypertension rate was 28.4% and 71.6% respectively. A total of 96 (47.1%) events occurred, with pre-eclampsia/eclampsia being the most frequent events (25.5%). The results demonstrates that ABP values are more strongly associated with events than casual BP values. In addition, DBP values have a stronger association with events compared to SBP and nocturnal blood pressure values also have a greater predictive value compared to daytime values.

Conclusion: These findings demonstrate that 24-hour ABPM is a useful adjuvant tool for the monitoring and management of women with hypertension disorders in pregnancy.

P30
Patients pain and anxiety in office hysteroscopy

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Keywords: Anxiety, Office hysteroscopy, Pain

Background: Office hysteroscopy is a routine technique very useful in gynaecology. This technique allows direct visualization and diagnosis, and it is the gold standard in uterine abnormal bleeding. Anxiety is always present before a medical intervention, and that anxiety is important for patient perception of pain. There seems to be a positive association between anxiety level and visual analog scale pain reporting. The State anxiety-trait inventory for adults (STAI) Form Y1 (administered for anxiety trait) and Form Y2 (administered for anxiety state) have been validated for evaluation and scoring of anxiety. Both consist of a self-administered twenty question sheet with four possible answers (not at all, somewhat, moderately so and very much so). Score values range from twenty to a maximum of eighty in each subscale.

Methods: One hundred and eighteen patients scheduled for office hysteroscopy at Centro Hospitalar Tondela-Viseu, were invited to enroll in this prospective observational study. After exclusion criteria, one hundred cases were analyzed. Before examination, a STAI Y1 and a STAI Y2 questionnaire was made. At the end of procedure, a ten centimetre visual analogue scale was used for pain evaluation and the State anxiety-trait inventory for adults questionnaires for anxiety assessment. Three other satisfaction questionnaires, each consisting of three answers, were also administered and investigated. Statistical analysis was performed with SPSS 22.0 IBM for windows and in a statistical hypothesis test with a p value <0.05 was considered statistically significant.

Results: The association between variables was evaluate by Spearman's correlation. There seems to be a weak correlation between anxiety and pain score which is not significant ($p>0.05$). The Kruskal Wallis test was used to evaluate the association between the pain score and the satisfaction variables, once again, anxiety scores were not significant ($p>0.05$) except for question number one and for the Y2 questionnaire (state anxiety) which showed a modest association between anxiety and pain ($p= 0{,}023$). In contrast, this same Kruskal Wallis test shows significant association between pain score and replies from satisfaction questionnaires ($p<001$). A ROC curve was constructed from binary responses to identify procedures as easy and hard to endure. Testing of the area under a ROC curve was conducted and the statistical results were significant ($p<0.001$).

Conclusions: Questionnaires on patient satisfaction may be useful and are reliable. Correlation between anxiety and pain reporting showed no influence with anxiety trait ($p= 0.4170$) and a mild correlation with anxiety state ($p= 0.146$).

P31
Modeling COVID-19 with graph theory and cellular automata as an alternative to overcome the limitations of the SIR model

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KEYWORDS: Modelling, Graph Theory, Cellular Automata, Covid19, SIR.

The mathematical modeling of COVID-19 was essential to predict the spread of the SARS-CoV-2 virus as well as to understand the transmission and the impact of the subsequential interventions taken to prevent its spread. Models for this task often rely on systems of differential equations, that although have good results regarding temporal evolution, generally lack consistency when it comes to other aspects like properties of space and heterogeneous populations. The aim of this research is to adopt a new approach to the modeling of COVID-19 in order to overcome the limitations of the classical models, such as the SIR model. By adopting an approach considering graph theory and cellular automata, it is expected that some of these limitations, like lack of spatial properties and the assumption of homogeneous populations will be mitigated. Some results have already been acquired, with focus on the creation and analysis of the contact network, which is the fundamental cornerstone to establish the creation of the transmission graphs.

P32
Determinants of Surgical site infection in hip and knee arthroplasty: A retrospective cohort study

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Keywords: Nosocomial infections, Arthroplasty, Risk factors, Perioperative procedures

Introduction: Nosocomial infections are the most common complication in hospitalized patients. The "Unidade Local de Saúde do Nordeste - ULSNE" taken part in the project "STOP Infeção Hospitalar!" in 2015, having registered a decrease in the infection rate of hip/knee arthroplasty until june 2018, when these gains were reversed. This study intends to describe and test the association between the risk factors seen in the literature (of the user and perioperative) and the occurrence of infection, in the ULSNE between the years 2017 and 2019.

Methods: An observational, retrospective cohort study was conducted with patients admitted to the ULSNE in the period of time under review. Taking into account the risk factors considered, a descriptive and bivariate analysis was made.

Results: A total of 716 arthroplasty in the to hip (n=347) and knee (n=369) were analysed to the referred hospital, including 276 programmed and 440 non-programmed surgeries. The mean age of the patients were 70.3 (9.3) years, with 54.3% females. A total of 4.2% of patients presented infection in the following 90 days after surgery (mean 30 days), with 86.7% (n=26) of the infections being deep, mainly by Staphylococcus aureus (n=12) and Staphylococcus epidermidis (n=6). Postoperative fever (n=713, 99.6%), lower glycemia levels (<180mg/dL) (n=668, 93.3%) and antibiotic therapy after surgery (n=630, 88.0%) and hemoderivatives use after surgery (n=8, 1.1%) were also analysed. There were no statistically significant differences between patient-related factors and the occurrence of infection. Regarding perioperative factors, blood glucose level was associated with the occurrence of infection in the context of hip arthroplasty and body temperature in the context of knee arthroplasty.

Discussion/ Conclusions: Only two of the study variables showed an association with the occurrence of infection, with the reduced number of users with infection being a limitation. A high level of adherence to the perioperative procedures implemented under the project "STOP Infeção Hospitalar!" was verified.

P33
The dimension reduction power of ClustOfVar: application of the variable cluster analysis technique in a mixed data health database

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Keywords: ClustOfVar, Clustering, Dimension Reduction, Generation XXI Cohort, Mixed Data

Background/Objective: Technological evolution is increasingly making real the elements necessary for the daily practice of personalized medicine, an improved vision of health care whose decisions regarding prognosis, diagnosis and therapeutic strategies depend on the patient's various characteristics. This approach leads to the collection and use of information that is broad in extension and complexity, for which dimensionality reduction techniques are imperative, in order to simplify and understand it. This paper aims to show the value of the ClustOfVar technique, a variable clustering technique capable of dealing with mixed data, resulting in data reduction. Through its hierarchical and non-hierarchical approaches, it replaces sample variables with representative synthetic variables. This dimensional reduction can be extended to individuals by applying Ward's method.

Methods: The cleaning process of anthropometric, obstetric, vital signs and pubertal status data from 700 participants of the Generation XXI cohort and/or their mothers led to variables being removed (181 down to 105 variables, 82 quantitative and 23 qualitative). Then, the hierarchical technique of the ClustOfVar package was applied, which started by building a hierarchy of variables. The optimal number of clusters was then determined, considering the aggregation level plot and the bootstrap methodology, and each cluster was characterized. The partition into clusters was then tried with the non-hierarchical process. Once the partition was defined, Ward's method was applied, dividing the participants into clusters. We finished with their description according to the synthetic variables.

Results: The partition in 8 clusters of variables suggested by the hierarchical technique was chosen, with the first and third cluster being filled mainly by maternal characteristics (relating mainly to menstruation and physical measurements, respectively). While cluster 2 mixes maternal and individual characteristics, cluster 4 contains only patient variables at birth. Cluster 5 is the most diverse, with anthropometric and related measurements of vital signs and blood macromolecules. Cluster 6 has total mass and fat measurements. Finally, cluster 7 is related to pubertal status variables, and cluster 8 includes cholesterol variables. The clustering of individuals results in the creation of specific profiles for each of the 8 clusters of individuals.

Conclusions: The ClustOfVar technique accomplishes a data transformation relevant to the dispersion of personalized medicine. However, it lacks the ability to deal with high proportions of missing data and its bootstrap process is very time-consuming.

P34
Coping strategies and psychosocial factors at work of dietitians/nutritionists: a multivariate analysis approach

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Keywords: BriefCOPE, Coping, COPSOQ-II, Dietitians/Nutritionists, Work Ability Index (WAI)

Background/Objective: Dietitians and nutritionists, like many healthcare professionals, frequently experience stress, which can be influenced by coping strategies (BriefCOPE) and the psychosocial work environment (COPSOQ-II) and their impact on work ability and stress levels (WAI). The main objective of this short paper is to examine how BriefCOPE and COPSOQ-II scales can be used to study coping with work-related stress among dietitians and nutritionists (n=301), with a focus on exploring the relationship among these scales and WAI.

Methods: BriefCOPE is a self-report measure of coping strategies, and it evaluates various coping strategies, including problem-solving, positive reframing, and avoidance coping. COPSOQ-II is a questionnaire that assesses various psychosocial factors related to the work environment, including job demands, job control, social support, and rewards. WAI is a tool used to assess an individual's work ability, considering their health status, physical and mental demands, and work-related resources. BriefCOPE and COPSOQ-II multivariate outliers were removed based on Mahalanobis distance. The sociodemographic characteristics, the BriefCOPE (n=285) and COPSOQ-II (n=233) scales association with WAI scores were analysed through Chi-Square, Kruskal-Wallis and one-way Analysis of Variance (ANOVA) tests. Exploratory (EFA) and confirmatory (CFA) factor analyses were conducted for both scales. Data was analysed using the R software.

Results: BriefCOPE and COPSOQ-II dimensions were obtained, and the WAI scores was reduced to three levels: "Poor/Moderate" (n=69; 22.9%), "Good" (n=158; 52.5%), and "Excellent" (n=74; 24.6%). About BriefCOPE and COPSOQ-II dimensions, association with WAI scores revealed 8 and 22 dimensions, respectively, with statistically different distribution among WAI categories. In exploratory factor analysis, for BriefCOPE scale the best model selected was constituted by 4 factors and explained 57% of variance, and for COPSOQ-II scale the best model was constituted by 7 factors and explained 64% of variance. In confirmatory factor analysis, the best models selected for each scale demonstrated better fit values in comparison with the theoretical models.

Conclusions: Most of the BriefCOPE and COPSOQ-II dimensions revealed statistically different distribution among WAI categories for the dietitians and nutritionists group. The excellent work capacity is related to the situation of "I almost always do this" for the dimensions of "Active coping", and "Positive reinterpretation" for BriefCOPE, and with the situations of "Never/almost never" or "Rarely" for the dimensions of "Role conflicts", "Work/Family conflict", "Stress", "Sleeping troubles", "Depressive symptoms", and "Bullying" for COPSOQ-II. This indicates that individuals with excellent work capacity frequently experienced active coping and positive reinterpretation, and never or rarely experienced stress, sleeping issues, burnout, and depressive symptoms. For both scales, EFA presented different factor structures when compared to the theoretical ones. Our data do not fit the theoretical models of BriefCOPE and COPSOQ-II scales, but present good results for the models proposed by EFA.

P35
Are coping and workplace psychosocial factors related to work ability in physicians? A PLS-SEM approach

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Keywords: Coping, partial least squares path modelling, physicians, work ability, workplace psychosocial factors

Background/Objective: Over the last few years, new statistical techniques have been developed in the context of multivariate analysis, which are proving to be very useful in the social or health sciences, even marketing. The aim of this work was to study the interplay between 3 scales: BriefCOPE for evaluating coping strategies; COPSOQII for assessing psychosocial factors; and WAI for assessing work ability.

Methods: Considering a subpopulation of physicians (n=35) we applied the Partial Least Squares Structure Equations Modelling (PLS-SEM) technique to study the relation between the 3 scales.

Results: Regarding the analysis of BriefCOPE and WAI, the only BriefCOPE domain significantly related to WAI was 'Strategies focused on emotions' (β=0.329;p=0.038). In COPSOQII and WAI analysis, the COPSOQII domain 'Health and wellness' was significantly associated with WAI (β= 0.599; p<0.001) with a strong effect. In final model regarding the three scales, we could observe that the apparent relationship between WAI and 'Strategies focused on emotions' (BriefCOPE) is mediated by the COPSOQII domain 'Health and wellness' (p = 0.047), which shows that there is small effect between the BriefCOPE and WAI.

Conclusions: This study is the first to test relationships between these three scales simultaneously. Using a PLS-SEM approach to analyse the data, the results of the present study highlight the central role of 'Health and wellness' in work ability and in the mediation between coping 'Strategies focused on emotions' and work ability. These data suggest that employers should implement organizational policies that enhance health and well-being in order to achieve better performance from their employees.

P36
Occupational health, well-being and ability to work in a sample of Portuguese Nurses

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Keywords: Coping with work; Well-being; Occupational health; Factor analysis; Nurses

Background/Objective: Occupational health is a multidisciplinary activity aiming to keep people mentally and physically well and safe at work. In nurses, it has deserved a particular attention, considering the complexity and demanding nature of the job. The current study aims to investigate the association between psychosocial variables, including coping with work (BriefCOPE) and psychosocial factors of work (COPSOQ-II), and ability to work (WAI) among Portuguese nurses.

Methods: An observational cross-sectional study with 111 Portuguese nurses was conducted and the outcome measures include socio-demographical variables, COPSOQ, BriefCOPE and WAI. To study the variables presented in the original database, a sociodemographic characterization was performed, followed by an exploratory factor analysis (EFA) to the COPSOQ and BriefCOPE dimensions. To quantify, test and confirm the results obtained in the previous analyses, a confirmatory factor analysis (CFA) was performed.

Results: Key coping dimensions were closely associated with better ability to work among nurses, particularly the use of instrumental support, planning, quantitative demands, and emotional demands. The EFA for BriefCOPE suggested a 5-factor structure, which is a slightly different factor structure for the corresponding 3 theoretical dimensions, and the CFA results show that the model is not fit to the data. Regarding the COPSOQ-II scale, the EFA suggested the same 8-factor structure of the original scale's theoretical model. For this scale, most of values obtained in CFA are consistent with the cut-off values, so a fit of the model to the data is possible.

Conclusions: The current study focus on potential factors playing a role in key well-being and coping with work outcomes on the psychosocial characterization of Portuguese nurses.

P37
Exploratory and Inferential Analysis of Children's Eye Defects Screening in the Region of Aveiro

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Keywords: ACES Baixo Vouga, CEDS, Functional Unit, USF, Primary Care Health Centre, Municipalities, USCP, Screening

Background/Objective: Amblyopia is one of the leading causes of monocular vision loss in children in Portugal, affecting 1 to 4% of children. Diagnosis and treatment of amblyopia at an early stage can prevent visual impairment, and thus the Children's Eye Defects Screening (CEDS) was implemented in primary care health centres nationwide with the aim to identify children with eye changes capable of causing amblyopia. The primary objectives of this study were to compare the proportion of screenings conducted in the different municipalities and the possible interference of the typology of functional units in adherence to screening.

Methods: An exploratory analysis using R Software was performed on the standardised screening data to identify differences between the 11 primary care health centres in the Region of Aveiro. In addition, an inferential analysis was performed using non-parametric tests such as the Kruskal-Wallis test and the Wilcoxon test, both used to verify whether there are significant differences between the analysed groups.

Results: It is possible to observe that the results obtained in 2021 were abnormal because of the COVID-19 pandemic, which lead to an increase in the number of screenings in 2022. The family health units had higher numbers of requests generated, screening attendances, and reports than personalised health care units, especially in 2021 and 2022. Most of the screening results were negative, with approximately 10% of screenings being positive and roughly 1% of scans being inconclusive. There also appears to be a growing trend of positive results in some municipalities, which may result from a higher reach to the target population of this screening.

Conclusions: The purpose of our statistical analysis was to identify differences between the primary health centres in Region of Aveiro. Our results show that might be useful to perform further studies in order to address potential inequities regarding CEDS access.

P38
Physicians' perceptions of psychosocial factors and coping strategies in their ability to work: a multivariate analysis

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Keyword: Physicians; Coping; Workplace; Burnout; WAI; COPSOQ-II; BriefCOPE

Background/Objective: Physicians play a crucial role in healthcare systems but face negative impacts from a challenging work environment, leading to burnout. Burnout has negative effects on physician health and patient care. Understanding psychosocial aspects of work and coping strategies used by physicians is essential. Validated tools, including COPSOQ-II, BriefCOPE, and WAI scales, can provide insight into the psychosocial impact of the medical profession. The study aims to use these scales to explore the relationship between job demands (COPSOQ-II), coping strategies (BriefCOPE), and work ability (WAI) among Portuguese physicians.

Methods: Participants were recruited through professional associations and organizations with access to physicians, and data was collected via a self-administered web-based questionnaire. Participants' sociodemographic characteristics were associated with WAI scores through Chi-Square analysis and One-way ANOVA. Outliers were detected through sensitivity analysis, and exploratory and confirmatory factor analyses were performed for the COPSOQ-II and BriefCOPE scales. Associations between WAI scores and COPSOQ-II and BriefCOPE scales were also analyzed.

Results: The study surveyed 55 physicians and found that except for sex, there were no significant differences in the work ability index (WAI) by sociodemographic characteristics. Significant differences were found between WAI and higher scores in job purpose, quality of management, and general health, while higher stress, sleep issues, and depressive symptoms were associated with lower WAI groups. Exploratory (EFA) and confirmatory factorial analyses (CFA) were conducted on the BriefCOPE and COPSOQ-II scales, revealing disconnection with the theoretical model. Under EFA, the BriefCOPE items related to theoretical dimension of "dysfunctional coping" are scattered into other coping dimensions, and the empirical model of the COPSOQ-II scale presented a different configuration from its theoretical model, either in the number of dimensions or in the distribution of items by their dimensions. Under CFA, these differences between the theoretical and empirical models are even clearer, as neither dataset fits to its theoretical counterpart without changes. In BriefCOPE, removing self-blaming is sufficient to correct this, while in COPSOQ, a minimum of 9 dimensions needed to be excluded. Even then this result presents unacceptable CFI(Comparative Fit Index), TLI(Tucker-Lewis Index) and RMSEA(Root Mean Square Error of Approximation) values.

Conclusions: This study analyzed physician perceptions of workplace environment and job-related and psychosocial factors using a questionnaire. However, the results did not provide any significant findings, and only suggested some possible associations between certain workplace factors, coping abilities, and work ability. The study had a small sample size and further research with larger sample sizes is needed to confirm these findings.

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P39
Neutrophil-to-lymphocyte ratio as a prognostic marker in highly PD-L1 expressing advanced non-small cell lung cancer patients in first line treatment with Pembrolizumab

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Introduction: Immunotherapy has revolutionized the treatment of advanced stage non-small cell lung cancer (aNSCLC). Peripheral markers such as the neutrophil-lymphocyte ratio (NLR) have been proposed to assess this response, given their easy availability and low cost. The aim of our study was to evaluate the relationship between NLR at baseline (NLR-T0), after the 3rd (NLR-C3) and 6th treatment cycles (NLR-C6), and progression free survival (PFS) and overall survival (OS), in a population with aNSCLC with a PD-L1 expression ≥ 50% treated with pembrolizumab monotherapy in first line. We also compared patients' clinical data, tumor characteristics (histology, PD-L1 expression), pembrolizumab toxicity between low and high NLR groups and its association with OS.

Methods: We performed a retrospective study of patients with aNSCLC with PD-L1≥50% and no identification of oncogenic drivers who were treated with pembrolizumab first line in the Pulmonary Oncology Unit from February 2017 to July 2021. Patients' data (demographic, tumor characteristics, treatment outcomes) were extracted from electronic medical records of the patients. NLR values at baseline and after the 3rd and 6th pembrolizumab cycles were analyzed in highly PD-L1 expressing aNSCLC patients treated with pembrolizumab monotherapy in first line. Optimal NLR cut-off were determined with respect to OS, by receiver operating characteristic (ROC) curve. PFS and OS were compared by Kaplan Meyer method and Cox Proportional Hazard model for NLR measures.

Results: Sixty-six aNSCLC patients with PD-L1 expression greater than 50% (51% males, mean age 65.8±11.2 years) were included in the study. In relation to histology, 65.2% patients had adenocarcinoma and 27.3% squamous carcinoma. The PD-L1 expression was 90% or more in 74% of the patients. Low NLR values (NLR≤4) after the 3rd pembrolizumab cycle were associated with a significant improvement in PFS (23.6 vs 4.3 months, p=0.002) and OS (32.9 vs 6.3 months, p=0.022) compared with high NLR values (NLR>4).

Conclusion: In patients with aNSCLC and a PD-L1 expression greater than 50% receiving frontline pembrolizumab treatment, low NLR values after the 3rd pembrolizumab cycle were associated with significantly longer PFS and OS. This biomarker may thus help identify individuals on pembrolizumab monotherapy who are at greatest risk for disease progression.