

# ANNUAL MEETING 2021



Proceedings of the 7<sup>th</sup> Annual Meeting

## Global Health | New Trends

17 – 19 JUNE  
Virtual



**Coimbra  
Health School**

Polytechnic of Coimbra





## TECHNICAL DATA

### **Title**

Coimbra Health School - Annual Meeting 2021  
Global Health - New Trends

### **Sub-Title**

Proceedings of the 7<sup>th</sup> Annual Meeting

### **Publishing company**

Instituto Politécnico de Coimbra  
Escola Superior de Tecnologia da Saúde

### **Editorial Coordination**

Diana Martins; Fernando Mendes; Hélder Simões; João Lima; Luís Cavalheiro

### **Date**

Junho de 2021

### **Cover design**

Carolina Melo; Helder Simões

### **ISBN**

978-989-8252-66-1 (*e-book*)

**Warnings**

The content of this publication does not necessarily reflect the official opinion of the Coimbra Health School. The institution is not responsible for the use that may be made of the information contained in this publication. This publication contains information obtained from authentic sources. Considerable efforts have been made to publish reliable data and information. However, editorial coordination cannot assume the validity of all materials or the consequences of their use.

**Brands**

Products or company names may be trademarks or registered trademarks and are used for identification and explanation only, with no intent to infringe.

**Copyright**

Reproduction is authorized, provided the source is acknowledged, unless otherwise specified.



ESCOLA SUPERIOR DE TECNOLOGIA DA SAÚDE DE COIMBRA  
Rua 5 de Outubro  
S. Martinho do Bispo  
3040-854 Coimbra  
Portugal

Web: [www.estescoimbra.pt](http://www.estescoimbra.pt) | <https://skyros-congressos.pt/am2021/>  
Email: [annualmeeting@estescoimbra.pt](mailto:annualmeeting@estescoimbra.pt)

## - Index -

Message from the Coimbra Health School President.....	2
Message from the Coordinating Committee.....	3
Message from the Congress President .....	4
Commissions.....	5
Scientific Program.....	6
Abstracts.....	10
Mental Health .....	11
Global strategy for women's, children's and adolescents' health .....	20
Emerging and Priority health technologies .....	25
COVID-19 Pandemic.....	29
Healthy lifestyles and health education .....	45
Public health and environment.....	56
Nutrition and noncommunicable diseases .....	58
Multimorbidity and polypharmacy in Elderly .....	62
Innovative pharmacological approaches for noncommunicable diseases .....	65
Hearing and balance disorders and rehabilitation.....	69
Musculoskeletal injury .....	74
Health promotion and disease prevention.....	84
Sleep and health .....	99
Diagnosis and monitoring of noncommunicable diseases .....	101

## MESSAGE FROM THE COIMBRA HEALTH SCHOOL PRESIDENT

JOÃO JOSÉ JOAQUIM

The year 2020 brought us a global challenge of an unprecedented dimension. To this challenge, science gave a thoughtful and also global response. Although the approach has not been unique at the world level, because political, organizational, social and economic criteria have created diversity in the implemented responses, it was possible to perceive the knowledge that research and science have produced. The pandemic has also brought greater attention from society to science, research, and even health systems' response. Another relevant factor in this context was the communication of health authorities. The uncertainty of the situation brought apparent advances and setbacks, with difficulty for the population to understand.

In this scenario, the preparation for the 2021 Annual Meeting was born, which was launched under the topic ***Global Health: New Trends***.

In a multidisciplinary way, the discussion of the current situation and future perspectives was the motto to create a program of excellence with renowned speakers, which stands out at the forefront of research, health care provision, and science. The event organization has already reached a relevant international projection and comprise a significant level of organization. We express our acknowledgement to all involved in organizing the event and the speakers, participants, who together give the dimension and projection provided by the number of registered participants and abstracts submitted.

## MESSAGE FROM THE COORDINATING COMMITTEE

**DIANA MARTINS AND JOÃO LIMA**

The International Annual Meeting 2021 is designed to be a forum for sharing knowledge and science between organizations, including academia, industries and experts. The Global Health has becoming increasingly challenged by the present conditions and therefore worth of permanent debate.

On its 7th edition, Annual Meeting 2021- Global Health, New Trends is aligned with the guidelines of the World Health Organization for Global Health. The meeting will highlight topics such the importance of Investment and Innovation in Health Technologies, Lifestyle changes in disease prevention, and how virus can shape life. The Work Health System and From Global Information to Local Intervention will also be addressed, among other relevant topics.

The Annual Meeting 2021 consolidates its role as an international event by having participants from all over Europe and Brazil. The pandemic allow us to have an outstanding programme with excellent speakers for 3 days of congress. Our event also presents 5 workshops in different areas of expertise. The submission rate of abstracts demonstrates the quality of our participants with 100 poster presentations and more than 120 oral communications from all over the world. The abstracts of oral communications will be publish in the European Journal of Public Health. We are grateful to all the authors that promote their work in Annual Meeting.

The great output of the event was only possible due to teamwork and significant engagement of all members of the Scientific and Organizing Committee. For that we would like to give a special word recognizing the commitment.

The visible part of the AM success are the participants that decide to spend these 3 days with us and share science and knowledge, as well as enhance the great atmosphere of Annual Meeting!

## MESSAGE FROM THE CONGRESS PRESIDENT

**FERNANDO MENDES**

The Annual Meeting 2021 topic is Global Health - New Trends. The pandemic we are facing and the moments we are living, highlight the fact that we need global strategies and to combine efforts in order to have better health of populations.

It is a fact that different individuals backgrounds, countries and social groups impact with individual health levels. With global actions to decrease health inequalities and inequities we will contribute for a better global health for all.

The relevance of Global Health-New Trends takes us to a science forum held between the 18 and 19 of June in virtual format at Coimbra Health School - Annual Meeting 2021. During these days, a panel of national and international experts will debate major topic that contribute to Global Health of populations. The subtopics under discussion are aligned with the Global Health Observatory from World Health Organization.

Two days of experiences and knowledge sharing, debating the future of health of populations, will be for sure a contribution for humankind, but step by step and with global actions we will make the change.

The health professions that are educated at Coimbra Health School, namely: Audiology, Biomedical Laboratory Sciences, Clinical Physiology, Dietetics and Nutrition, Environmental Health, Pharmacy, Physiotherapy, Medical Imaging and Radiotherapy, all have a role in health systems at the multidisciplinary team in intercomplementarity with the other health professions.

A special word to all health professionals, researchers and students that decide to participate, to submit their research results, their work for knowledge deepen of all.

Thank you for your participation!

## COMMISSIONS

### CONGRESSE PRESIDENT

Fernando Mendes

### COORDINATION COMMITTEE

Diana Martins and João Lima

### SCIENTIFIC COMMITTEE

President: Luís Cavalheiro (Portugal), Ana Lúcia Baltazar (Portugal), Armando Caseiro (Portugal), Clara Rocha (Portugal), Cristina Murphy (United Kingdom), Cristina Santos (Portugal), Daniel Courteix (France), Florence van Hunse (The Netherlands), Gry Sjøholt (Norway), Helder Santos (Portugal), Inês Araújo (Portugal), Isabel Andrade (Portugal), Itallo Collopy Junior (Brazil), João Filipe Calapez de Albuquerque Veloso (Portugal), Julie Lovegrove (United Kingdom), Luís Saboga Nunes (Portugal), Marie Culliton (Ireland), Nejc Mekiš (Slovenia), Óscar Tavares (Portugal), Rui Cruz (Portugal), Samuel Agüero (Chile), Ana Paula Amaral (Portugal), Magdalena Golachowska (Poland), Emília Telo (Portugal), Agostinho Cruz (Portugal), Vitor José Nogueira Mendes (Switzerland), Marcia Sofia da Silva Ferreira Soares (United Kingdom), Tania Fleig (Brazil), Luis Henrique Telles da Rosa (Brazil), Maria das Graças Wanderley de Sales Coriolano (Brazil).

### ORGANIZING COMMITTEE

Célia Gomes (Portugal); Cristina Nazaré (Portugal); Helder Simões (Portugal); Joaquim Pereira (Portugal); Mário Monteiro (Portugal); Paula Pacheco (Portugal); Sónia Fialho (Portugal); Paula Fonseca (Portugal).

## SCIENTIFIC PROGRAM

### FRIDAY, JUNE 18

9:30     **Opening Session**

10:00    **Tech4health**

**Moderator:** *Jorge Figueira*

- Investment and Innovation in Health Technologies: A Case Study  
*Antero Abrunhosa*
- New Technologies applied to health: Portuguese reality  
*João Quintas*
- Medical Device Cybersecurity  
*Miguel Pupo Correia*

11:45    **When Human behaviors and life is shaped by virus**

**Moderator:** *Margarida Saraiva*

- Virus: Friends or Foes?  
*Rogério Vaz Saad*
- How so few can stay protected by some many: Herd group immunity  
*Alfredo Corel*
- The syndemic of HIV, HIV-related risk and multiple co-morbidities: a Portuguese reality  
*Ana Cláudia Miranda*
- Virology and vaccination: When the enemy is used to defeat their own troupes  
*Lars Frelin*

14:15    **Lifestyle Diseases in Modern Era**

**Moderator:** *Francisco Goiana da Silva*

- A Challenges in Cardiovascular Health  
*Rui Fonseca Pinto*
- Neuroscience and obesity: a new relationship  
*Gabriela Ribeiro*
- Future of medical devices  
*Metin Akay*
- Epigenetics and Cancer  
*Filipa Vieira*

16:00 **Lifestyle changes in disease prevention: Does it work?**

**Moderator:** *Jorge Machado*

- Public Health in Disaster Contexts  
*Mariana Neto*
- Design Thinking: An approach for Healthcare Improvement  
*João Pequeno*
- Gaming and Health Promotion  
*Marlene Rosa, Cátia Pontes*
- Sustainability and Public Health: where are the gaps?  
*Francisco Ferreira*

18:00 **Oral Communications**

## SATURDAY, JUNE 19

### 9:00 Oral Communications

#### 10:00 The Work Health System awakens! May the work force be with you!

**Moderator:** *João José Joaquim*

- New paradigme of labor relationships in healthcare professionals: COVID-19 influence  
*Miguel Ricou*
- The relevance of interdisciplinary team work in health workforce - National Health Council  
*Henrique Barros*
- How allied health professionals contribute to the outcome of health national systems - ACSLM  
*Marie Culliton*

#### 11:45 Universal Health Care: Myth or Reality

**Moderator:** *João Luís Campos*

- Universal health coverage in pandemic situation  
*Nuno Jacinto*
- Health Governance in pandemic situation  
*Célia Cravo*
- COVID-19 and Universal Health Care in Portugal  
*Carla Nunes*

#### 14:15 From Global Information to Local Intervention

**Moderator:** *Paulo Marques*

- Health Information Systems and Policy Design for chronic non-communicable diseases  
*João Breda*
- Health@Portugal: Think global, act local  
*António Lacerda Sales*
- From Big Data to Health Care System Managment  
*Luís Filipe Loureiro Góis Pinheiro*
- Healthy Urban Planning  
*Ângela Freitas*

16:00 **Embrace Women and Children Health assure for the Future**

**Moderator:** *Lúcio Meneses Almeida*

- Early childhood intervention: Preschool Project  
*Rita Nobre / Susana Montenegro*
- Influence of the family on child development  
*Teresa Mota Castelo*
- Obesity, the silent growing disease in children  
*Ana Rito*

16:30 **Final Conference**

**Moderator:** *Fernando Mendes*

- Health Systems Management and Organization in Global Health  
*Joaquim Cunha*

18:00 **Award Session: Best Oral Communication and Poster**

18:15 **Closing Session**

## ABSTRACTS

Mental Health

## Mental Health

PO - (AM2021-27625)

### VITAMIN D IN THE TREATMENT OF BRAIN CHANGES SUCH AS DEMENTIA/DEPRESSION

Ruben Costa<sup>1</sup>; Prof. Ana Paula Fonseca<sup>1</sup>

**Keywords:** Vitamin D, Dementia, Depression, Hypovitaminosis D

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Farmácia, Portugal

#### Background

Dementia is characterized by multiple cognitive deficits including impairment in memory and encompasses four subtypes, being Alzheimer's disease the leading cause of dementia in the elderly, thus becoming a worldwide concern due to its high prevalence and incidence, adverse consequences and lack of a cure. Depression is a disorder that can manifest itself through feelings of sadness, anxiety, despair, guilt, and can even lead to loss of interest in physical activity, loss or gain of appetite, concentration problems and, in more serious cases, attempted suicide. Although widely diagnosed, it is not treated because of stigma, lack of effective therapies and inadequate mental health resources.

#### Methods

In this systematic review Medical Subject Headings (MeSH) and key words in text with the terms "Vitamin D", "Depression" and "Dementia" were used, being analyzed in different studies, the neuroprotective capacity of vitamin D in dementia and the association of hypovitaminosis D to depression. In both cases the effects of a vitamin D supplementation on treatment/protection in these diseases were evaluated.

#### Results

A deficiency in vitamin D levels seems to be associated with a substantial increase in the risk of developing dementia, as well as, in the development of depression in people at risk, however, it still generates some doubts in relation to healthy individuals.

#### Conclusion

Vitamin D supplementation appears to be beneficial in conjunction with other therapies in order to protect/delay the development of these conditions.

## Mental health

PO - (AM2021-27634)

### PIEGT16: PORTUGUESE SCALE TO ASSESS THE EMOTIONAL INTELLIGENCE PROFILE

Sonia Brito-Costa<sup>3,4,5</sup>; Hugo Almeida<sup>1</sup>; Rui Antunes<sup>5</sup>; Florencio Castro<sup>2</sup>

**Keywords:** WEIP-S, TMMS24, Emotional Intelligence, Psychometric Properties

1 - University of Aveiro, CNL – Consumer Neuroscience Lab, ISCA; 2 - Universidade da Extremadura, 3 - Polytechnic Institute of Coimbra, Human Potential Development Center (CDPH), Portugal; 4 - Polytechnic Institute of Coimbra, Institute of Applied Research (i2A), Portugal; 5 - Polytechnic Institute of Coimbra, Coimbra Higher School of Education, Research Center in Social and Human Sciences (NICSH), Portugal

#### Background

This investigation was split in two separate studies, both based in the Emotional Intelligence Model proposed by Mayer e Salovey (1997) and intended to translate and validate a scale of emotional intelligence assessment to the Portuguese population.

#### Methods

In the first study, after translating and adapting the Workgroup Emotional Intelligence Profile - short version (WEIP-S) (Jordan & Lawrence, 2009), we evaluated its internal consistency and constancy. The second study evaluated the dimensionality (as an approximated measure of factor analysis) and the validity of the criteria, by comparison with a parallel instrument already validated for the Portuguese population (Trait Meta-Mood Scale - TMMS24 - Queiroz et al. (2005) and double check its internal consistency. After the first study, the WEIP-S was designated as PIEGT16 - Perfil de Inteligência Emocional do Grupo de Trabalho - 16 itens (Work Group Emotional Intelligence Profile – 16 items). The sample of the first study consisted of 150 participants and 369 participants for the second study.

#### Results

Both internal consistency and constancy were found in study 1, as revealed by the statistical significance of correlations in test-retest. In study 2, a Four-Factor Model was extracted by grouping the same itens as in the original scale (Jordan & Lawrence, 2009).

#### Conclusion

Despite the low values observed, both correlations were statistically significant, hence showing concurrent validity, while internal consistency showed regular values. The results indicate that the WEIP-S's portuguese version (PIEGT16) revealed good psychometric characteristics.

## Mental health

PO - (AM2021-27653)

### STRESS AND SLEEP DEPRIVATION AMONG AUDIOLOGISTS DURING COVID-19 PANDEMIC: AN INTERVENTION PROPOSAL

Sandra Isabel da Costa Ferreira<sup>1</sup>; Ana Paula Amaral<sup>1</sup>

**Keywords:** mental health, stress, sleep, audiologist, health promotion

1 - Instituto Politécnico de Coimbra- Escola Superior de Tecnologia da Saúde de Coimbra

#### Background

SARS-CoV-2 was first identified in humans in December of 2019 in Wuhan, China, leading to various health risks, both physical and mental. Audiologists are faced with higher levels of stress at their work, and this accumulation can contribute to a nervous breakdown which in consequence will impair sleep quality. Aims: 1) To evaluate the impact of the COVID-19 pandemic on stress and sleep quality in Audiologists; 2) To develop, implement and evaluate a mental health promotion program for Audiologists.

#### Methods

An analytical study with a pretest-posttest design will be done, with an evaluation before and after intervention. We expect 100 audiologists to participate. Measures: Portuguese version of Pittsburgh Sleep Quality Index, Portuguese version of Perceived Stress Scale and actigraphy (to assess the sleep-wake cycle). The intervention will run for twelve weeks, three sessions a week, with distance methodologies. Each week will include a session of sleep hygiene. Moreover, yoga sessions and risotherapy will be held once a week, each for 30 minutes. In addition to the group sessions, individual sessions will be held with a psychologist once a week with a maximum duration of 40 minutes.

#### Results

Stress levels are expected to decrease by around 30% and the quality of sleep to increase by 20%.

#### Conclusion

The development of stress management interventions is fundamental to promote mental health in audiologists with a focus on sleep quality.

## Mental health

PO - (AM2021-27678)

### THE RELATIONSHIP BETWEEN ANXIETY, DEPRESSION AND CARDIOVASCULAR DISEASE - A CROSS-SECTION STUDY

Rui Gonçalves<sup>2</sup>; Raquel Sousa<sup>1</sup>; Inês Rosendo<sup>1</sup>

**Keywords :** cardiovascular disease, anxiety disorders, depressive disorders

1 - USF Coimbra Centro; 2 - Faculdade de Medicina da Universidade de Coimbra

#### Background

Cardiovascular disease represent the leading cause of death worldwide. Furthermore, cardiovascular disease is also responsible for the consumption of many medical resources, work absenteeism and for worse quality of life of the patients. On the other hand, psychiatric diseases have recently gained more relevance worldwide as one of the principal causes of disability.

#### Methods

Observational and cross-sectional study in a convenience sample, composed by patients followed on 5 portuguese primary healthcare facilities, who voluntarily accepted to answer the questionnaire through an interview, which took place between July 2020 and January 2021. After informed consent, a questionnaire was carried out including sociodemographic characterization, presence of cardiovascular disease and/or cardiovascular risk factors and the Portuguese version of HADS. Descriptive and inferential statistics were performed, using Mann-Whitney U test. A value of  $p < 0,05$  was considered statistically significant.

#### Results

Sample of 179 people, 53,1% female, in which 57,5% had one or more CVRF and 59,8% had CVD and/or CVFR and the most prevalent CVRF were hypertension (48%) and dyslipidemia (43,6%). There was a statistically significant relationship only between diabetes and anxiety ( $p=0,005$ ).

#### Conclusion

There was a greater risk of anxiety in people with diabetes compared to people without diabetes. In clinical practice, this fact suggests the importance of giving attention to anxious symptoms in people with diabetes, given the relevance of this comorbidity in patients` quality of life. The main limitation of the study is related with the sample size which, if maximized and randomized, would make it possible to confirm and generalize the data obtained

## Mental health

PO - (AM2021-27679)

### PSYCHODERMATOSES: THE DEPRESSING SKIN

Vera Galinha<sup>1</sup>; Ana Paula Fonseca<sup>1</sup>

**Keywords** : skin, psychodermatology, psychosomatic

1 - ESTESC - Coimbra Health School

#### Background

The skin is the dynamic interface between the external environment and the internal environment of the body, in addition to being considered essential for communication at all levels. Being our skin, our brand image, is understood that its appearance often determines the image that we make of others and that others make of us. The general appearance that it presents also provides some clues to some dysfunctions of the body. Many dermatological diseases can be triggered or exacerbated by psychological problems. However, the opposite is also true, and the changes at a cosmetic and / or functional level can be so profound that they trigger situations of stress, anxiety, depression, among others.

#### Methods

Bibliographic review by searching several databases (PubMed, Google Scholar, ScienceDirect, Scielo and Wiley Online Library).

#### Results

Although there is no unanimity regarding the classification of different psychodermatoses, studies suggest dividing them into 3 groups based on the causal, consequent or exacerbating role of the psychological factor. In a disease classified as psychodermatosis, it is essential to take into account the preponderant role that the psychological component assumes in the diagnosis, treatment and prevention of dermatological disorders

#### Conclusion

Advances in therapy along with scientific data demonstrate the strong correlation that exists between dermatology and psychiatry / psychology. The future is based on a holistic approach to the individual, which will make it possible to advise a specialized therapy focused on oneself, with more benefits for the patient and which will allow him to have a better quality of life.

## Mental health

PO - (AM2021-27712)

### BURNOUT AND HEART RATE VARIABILITY IN SHIFTWORKERS FROM A HEMODYNAMICS' UNIT

Joaquim Pereira<sup>1</sup>; Joana Martins<sup>1</sup>; Silvia Santos<sup>2</sup>; Telmo Pereira<sup>1</sup>

**Keywords :** Stress, burnout, HRV, cardiovascular disease, holter

1 - ESTESCoimbra; 2 - CHUC

#### Background

The Burnout concept is very present in nowadays' society, especially when it talks about jobs that imply taking care of others. It is known that there is a relationship between stress and cardiovascular system. As an added factor to the development of chronic stress, is shiftwork. Changes in Heart Rate Variability (HRV) can be seen as an early indicator of cardiovascular diseases.

The objective of this Project, was study health professions from a Hemodynamic Service to understand how the burnout level of the participants are reflected in the HRV and, consequently, in the health status of their cardiovascular system.

#### Methods

Holter was used to obtain 24h monitoring of the heart rhythm and was connected in the beginning of the shift, obtaining the HRV variation. Burnout levels were obtained using Maslach Burnout Inventory.

#### Results

Age and HRV evolve in an inverse way, in a statistically significant way. The numbers of shiftwork years has some statistically significant value although it can also be influenced by age. When we compare levels of burnout and HRV, in qualitative terms, there is a greater reduction in HRV in people with higher levels of burnout and also a reduction in the action of the Parasympathetic and with an increase in the activity of the Sympathetic.

#### Conclusion

There is a probable relationship between exposures to chronic stress and great emotional exhaustion – Burnout Syndrome – and reduced HRV. Consequently, who with higher levels of burnout, have a higher cardiovascular risk.

## Mental health

PO - (AM2021-27815)

### THE ASSESSMENT OF EMOTIONAL INTELLIGENCE IN HEALTH PROFESSIONAL AND INSERTION OF SOCIOEMOTIONAL EDUCATION IN HIGHER EDUCATION INSTITUTIONS

Priscila Granemann<sup>1</sup>; André Luis Fonseca Dias Paes<sup>1</sup>; Bruna Magalhães Ibañez<sup>1</sup>; Giulia Vittoria Ambrog Pereira<sup>1</sup>; Rogério Saad Vaz<sup>1</sup>

**Keywords :** Emotional intelligence, Health person, Health education

1 - Faculdades Pequeno Príncipe

#### Background

Emotional Intelligence (EI) reflects the interrelationships between thoughts, feelings, and skills, investigate emotional reactions and interpretations as well as the role of emotions in intelligent behavior. This research area has contributed to reflections and criticism in the clinical, educational, occupational, and social settings. Especially health institutions, which are spaces where emotional feelings reflect relationships and the environment and the education with only cognitive domains has been shown unsatisfactory.

#### Methods

The research aims to validate a questionnaire called Emotional Intelligence Measure (EIM) focused on health professionals of a large children's hospital, and thus indicate if there is a need for emotional learning in higher education institutions. This work is a quantitative, exploratory, and descriptive study. A closed structured questionnaire was created and validated by Siqueira; Barbosa; Alves, 1999 and 106 professionals were interviewed.

#### Results

The validation proved to be satisfactory with Cronbach's alpha 0,8. The results of the research indicated that professionals over the age of 30 had greater self-knowledge, nursing technicians demonstrated low sociability and empathy had a lower response rate when compared to the other pillars of EI.

#### Conclusion

Thus, therefore, health education institutions need conditions for EI to be part of teaching and must welcome social experiences, with the development of relationships linked to knowledge, enabling better performance in the work environment and humanistic development.

## Mental health

PO - (AM2021-27844)

### LOVE IN CONSTRUCTION AND DECONSTRUCTION: A CHEMICAL APPROACH

Manuel Bandeira dos Santos Neto<sup>1</sup>; Ana Angélica Mathias Macêdo<sup>2</sup>; Fernando Mendes<sup>3</sup>

**Keywords:** neurobiological phenomenon, construction of love, physical-biological sensations, social relationships, love's chemistry

1 - Universidade Federal Rural de Pernambuco; 2 - Instituto Federal do Maranhão; 3 - Instituto Politécnico de Coimbra - Escola Superior de Tecnologia da Saúde de Coimbra - Departamento de Ciências Biomédicas Laboratoriais

#### Background

Is love: cultural, emotional, spiritual, physical and / or social? Love is a complex neurobiological phenomenon based on brain activities that include desire, trust, pleasure and reward. In addition, it involves a high number of chemical messengers called neurotransmitters. Thus, this research aims to present a construction of love as a neurobiological phenomenon and a deconstruction as a physical, spiritual and / or social phenomenon only. Furthermore, we sought to answer the following questions: how do we fall in love? Why do we love? What neurotransmitters are fundamental to passion and love?

#### Methods

For this, a bibliographic search was made in journals and books to discuss love, its different phases, models and theories of how do we fall in love and how our brain reacts to this phenomenon.

#### Results

From that, it was noticed that people in love have strong brain activity in regions associated with addiction. And throughout the different phases between passion and love, several neurotransmitters act in the organism of lovers: norepinephrine, dopamine, serotonin, norepinephrine, oxytocin and vasopressin. Also, we found different theories and models of love and how the human being related to his/her partners. In the words of the poet Fernando Pessoa: "when I saw you, I loved you long before". Love with an image falls in love with the image and loves its being.

#### Conclusion

Therefore, this work brought contributions to the area of mental health, focusing on emotions and physical-biological sensations affected by the neurotransmitters involved in love as a neurobiological phenomenon that affects social relationships.

Global strategy for women's, children's and adolescents' health

## Global strategy for women's, children's and adolescents' health

PO - (AM2021-27766)

### USE OF MELATONIN IN PEDIATRICS: ASSOCIATED RISKS AND BENEFITS

Zélia Barbosa Moreira<sup>1</sup>

**Keywords:** melatonin, Sleep disorders, benefits and risks

1 - Polytechnic Institute of Coimbra, ESTESC, Farmácia, Coimbra, Portugal

#### **Background**

Sleep is essential for normal growth and development, both in the physical and emotional aspects of the child. It is during sleep that the balance between the different parts of the CNS is restored, memory consolidation, energy conservation, optimization of immune functions and hormone production.

Sleep disorders have consequences not only in the short term, such as difficulties in attention, concentration and daytime sleepiness, but also in the long term, such as cardiovascular problems, obesity, depression, among others. According to the different ages a certain number of hours of sleep is advised.

Melatonin is a hormone produced mostly by the pineal gland in the brain and to a lesser extent by the retina. For the treatment of sleep disorders Pediatricians have prescribed melatonin.

#### **Methods**

Bibliographic review through a research in diverse databases (PubMed, Google Scholar, ScienceDirect and Wiley Online Library).

#### **Results**

Melatonin has been shown to be effective in inducing and maintaining the sleep cycle in children, including children with ADHD, autism and other neurodevelopmental disorders. However, there are studies that show that the use of melatonin has side effects at the level of the immune, metabolic and cardiovascular systems

#### **Conclusion**

In general, studies have shown that melatonin has beneficial effects in the treatment of sleep disorders, not only primary, but also associated with mental, neurological or other medical problems. However, little is known about the long-term effects of melatonin in children.

## Global strategy for women's, children's and adolescents' health

PO - (AM2021-27816)

### THE ROLE OF CYTOKINES IN EMBRYO IMPLANTATION

**Andressa Rossi Junkes**<sup>1</sup>; André Fonseca Dias Paes<sup>2</sup>; Bruna Magalhães Ibañez<sup>2</sup>; Camila Moraes Marques<sup>4</sup>; Isadora F. G. Sena<sup>3</sup>; Alexander Birbrair<sup>3</sup>; Rogério Saad Vaz<sup>4</sup>

**Keywords:** Cytokines, Embryo implantation, Immune tolerance, Immunological factors, Fertilization

1 - Faculty of Medicine, Little Prince College, Curitiba, Paraná, Brazil; 2 - Member of a scientific initiation program and undergraduate medical student, Faculty of Medicine, Little Prince College, Curitiba, Paraná, Brazil; 3 - Department of Pathology, Federal University of Minas Gerais, Institute of Biological Sciences, Belo Horizonte, Minas Gerais, Brazil; 4 - Master's Program in Teaching in Health Sciences - PECS, Little Prince College, Paraná, Brazil

#### Background

The embryo implantation process requires balanced and synchronized molecular signaling pathways between the embryo and the endometrium in which cytokines play an essential role to create an adequate environment for implantation, especially the embryotrophic type.

The purpose of this article is to elucidate the role of promoter cytokines of embryo implantation.

#### Methods

An electronic research was performed for English articles in databases, including SciELO, PubMed, CAPES/MEC periodical portal, Nature research, Science Direct, LILACS and Cochrane, from 1998 to 2020. The articles most appropriate to the theme were chosen and referenced in this work.

#### Results

The cytokines LIF, GM-CSF, G-CSF, IL-6, IGF-1, IGF-2, IL-10 and IL-11, impact on cellular functions of embryo and endometrium through their primary abilities to change the property of several cells and tissues. Therefore, these cytokines can play embryotrophic functions, being promoters of embryo implantation, and coexist in a stability with those playing embryotoxic actions, TNF, TRAIL, IFN- $\gamma$ , non-promoters of embryo development.

#### Conclusion

The promoter cytokines are an important determinant of embryos survival and its implantation capacity. A balance between embryotrophic and embryotoxic cytokines is essential to create an adequate environment for implantation, mainly favoring the promoters of embryo development in implantation window. Hence, a disbalance may cause implantation failure, which is the major cause of pregnancy loss and infertility in humans and animals. Despite the extensive research, this field presents a vast domain which remains understood and can revolutionize the way we understand embryo implantation and what concerns the universe of fertilization.

## Global strategy for women's, children's and adolescents' health

PO - (AM2021-27852)

### DOSE-AREA PRODUCT IN PEDIATRIC CARDIOLOGY INTERVENTIONAL PROCEDURES

Akemi Yagui<sup>1</sup>; Hugo Schelin<sup>1</sup>; Valeriy Denyak<sup>2</sup>; Luiza Costa<sup>1</sup>; Paula Vosiak<sup>1</sup>; Helen Khoury<sup>3</sup>; Danielle Filipov<sup>4</sup>

**Keywords:** radiation protection, child, fluoroscopy, radiation dosage

1 - Pelé Pequeno Príncipe Research Institute; 2 - National Science Center Kharkov Institute of Physics and Technology'; 3 - Federal University of Pernambuco; 4 - Federal University of Technology – Paraná

#### Background

In pediatrics, the cardiac catheterization procedures are performed to diagnose or treat congenital heart disease and their main advantage is that they are less invasive when compared to surgery. However, such procedures provide high doses of radiation to patients. The radiological protection in this type of radiology is essential, because the children are more sensitive to radiation. Objectives: to estimate the dose-area product (DAP) and fluoroscopy time in pediatric patients of different age and weight groups in cardiac catheterization procedures in a pediatric hospital.

#### Methods

The data were obtained through the report provided by the equipment, which has a dose meter attached to the output of the X-ray tube and provides the DAP values, fluoroscopy time, in addition to sex, age and weight of the evaluated patients.

#### Results

Weight or age values did not significantly influence DAP rate values. The mean age and weight of patients undergoing cardiac catheterization procedures was higher when compared to similar studies.

#### Conclusion

The correlation between weight and age is linearly dependent, so the implementation of protocols according to the patient's age and weight range could result in DAP optimization. The definition of reference dose level values for the weight and age ranges presented in this work are be an important factor in the optimization of the exposure dose of pediatric patients.

## Global strategy for women's, children's and adolescents' health

PO - (AM2021-27882)

### RISK OF RADIO-INDUCED TUMOURS DUE TO DOSES RECEIVED IN PAEDIATRIC CT AND DOSE REDUCTION STRATEGIES

Magda Correia<sup>1</sup>; João Costa<sup>1</sup>

**Keywords:** Pediatrics, Radiology, Radiation Protection, Tomography, X-Ray Computed

1 - Escola Superior de Saúde Dr. Lopes Dias - Instituto Politécnico de Castelo Branco

#### **Background**

The number of paediatric CT (computed tomography) exams has been increasing in recent decades, which raises the question of a possible health impact due to the doses received, especially the increased risk of developing a radio-induced tumour.

This work consists of a systematic review of the literature, of a descriptive-correlational type, whose main objective is to relate the risk of radio-induced tumours due to the doses received in paediatric CT and the need for dose reduction strategies.

#### **Methods**

The research methodology for carrying out this work was based on bibliographic research between the years 2011 and 2020, which fit the inclusion criteria and the research instruments of the bibliographic references were books and databases.

#### **Results**

There is, in fact, an increased risk of developing radio-induced tumours due to the doses received in paediatric CT, therefore dose reduction strategies should always be used. It is necessary to properly implement guidelines and protocols in the imaging services where paediatric CT is performed, since, according to studies carried out, after the optimization of protocols, the dose used decreases substantially.

#### **Conclusion**

The most effective dose reduction strategies are the optimization of protocols, the automatic selection of kVp, the modeling of the current and the application of iterative reconstruction algorithms.

Emerging and Priority health technologies

## Emerging and Priority health technologies

PO - (AM2021-27668)

### EFFECT AND SAFETY OF PROBIOTICS TO REDUCE THE INCIDENCE OF ATOPIC DERMATITIS

Rita Natália Couto Santos<sup>1</sup>; Ana Paula Fonseca<sup>1</sup>

**Keywords** Atopic Dermatitis, *Staphylococcus aureus*, Probiotics, *Bifidobacterium*, *Lactobacillus*

1 - Escola Superior de Tecnologia da Saúde de Coimbra

#### **Background**

Atopic dermatitis (AD) is a chronic inflammatory disease, characterized by dry skin, intense itching, recurrent eczematous lesions and loss of sleep, which affects the quality of life of patients. Probiotics are "living microorganisms that confer health benefits to the host when administered in adequate amounts". The purpose was to study the use of probiotics in AD as a method of prevention, safety and efficacy, and the most studied and effective probiotics belong to the genera *Bifidobacterium* and *Lactobacillus*.

#### **Methods**

This study was carried out at the School of Health Technology of Coimbra, being a systematic review. The study period ranged from 2014 to 2019 with a duration between September 2019 and June 2020. The study population was aged between 0 months and over 18 years, including pregnant women. In addition, all scientific articles and information were collected through the following databases, *PubMed*; *B-on* and; *Google Scholar*.

#### **Results**

Probiotics are generally considered safe, however they are not exempt from adverse effects, such as systemic infections, harmful metabolic activities, excessive immune stimulation and gene transfer. In addition, several investigations have shown results with efficacy and effectiveness in reducing the incidence of atopy, in the use of probiotics or in the combination of probiotics.

#### **Conclusion**

It is crucial to study the evident anatomophysiology relationship of the intestine with the use of probiotics and their progressions in the incidence of AD. However, further studies are needed to prove the use of probiotics as a new therapeutic strategy in AD.

## Emerging and Priority health technologies

PO - (AM2021-27854)

### DEVELOPMENT OF A 3D ARTIFICIAL LUNG AS A TOOL FOR TESTING DRUG CANDIDATES FOR COVID-19

**NN Rosa**<sup>1</sup>; NB Oliveira<sup>1</sup>; AC Irioda<sup>1</sup>; PEF Stricker<sup>1</sup>; BF Mogharbel<sup>1</sup>; MC Perussolo<sup>1</sup>; KAT Carvalho<sup>1</sup>

**Keywords:** LUNG, 3D PRINTING, COVID-19, PRECLINICAL DRUG EVALUATION

1 - Cell Therapy and Biotechnology in Regenerative Medicine Department, Pelé Pequeno Príncipe Institute, Child and Adolescent Health Research and Pequeno Príncipe Faculties.

#### Background

In December 2019, cases of human infection with COVID-19 began in China and, in January 2020, the World Health Organization declared a state of international emergency. Considering the search for new drugs to fight this disease and that the lung is one of the main targets of the SARS-CoV-2 virus, we propose developing a 3D prototype of a functional artificial lung in vitro.

#### Methods

Wharton's jelly human mesenchymal stem cells (MSCs) were isolated, characterized by flow cytometry, and differentiated into adipocytes, osteocytes, and chondrocytes. To develop the 3D pulmonary alveolus, MSC will be differentiated into pneumocytes type I and II, basal cells, ciliated cells, and mucus-producing cells. Immunocytochemistry and RT-PCR will be performed to confirm their differentiation. The structure will be printed in a 3D bioprinter and sodium alginate bioink, and the vascular system will use endothelial cells.

#### Results

The cells showed a human MSC antibody profile with expression for the CD73, CD90, and CD105 markers and non-expressive CD34 and CD45 markers. It was also observed that the cells are viable for cell therapy because they have expressive HLA-ABC and non-expressive HLA-DR markers. In addition, the cells were differentiated into adipocytes, osteocytes, and chondrocytes, colored with Oil Red, Alizarin Red, and Alcian Blue, respectively, to demonstrate their pluripotency.

#### Conclusion

The 3D cell culture aims to reproduce the complexity of the tissues and particularly for the lung tissue, and can be a valuable alternative for in vitro drug tests.

## Emerging and Priority health technologies

PO - (AM2021-27772)

### IRRADIATION, A METHOD OF EXCELLENCE OR TECHNOLOGICALLY OUTDATED?

Ana Santos<sup>1</sup>; [Ana Lúcia Baltazar](#)<sup>1</sup>

**Keywords:** irradiation, food processing, non-thermal methods, conservation techniques, food quality

1 - Polytechnic Institute of Coimbra, Coimbra Health School

#### Background

Irradiation is a method used in food processing to extend the shelf life of foods. Wide dissemination of this method and its repercussions from the macroeconomic point of view justify a bibliographic review. The aim of this research is to analyze the use of irradiation in fresh food, like fruit and vegetables, as a global conservation technique.

#### Methods

Scientific review using the keywords "irradiation" and "food processing" on scientific and technological databases, since 2000. Simultaneously, analyzed official reports from U.S. Food and Drug Administration and World Health Organization.

#### Results

This technology has been registered a reduction in its application in Europe and the United States of America and a significant increase in emerging economies. It promotes an increase in their macroeconomic potential, with a positive impact in reducing the microbial load and increasing the time of shelf life of food. Irradiation is therefore highly recommended for inactivation of pathogenic microorganisms and if combined with other methods, it can increase the food quality of the products.

#### Conclusion

Today, the scientific community have important pieces of evidence that a nonthermal procedure like irradiation have a vital role in the shelf-life increase of fruits and vegetables. This is conservation technic used at a global level.

COVID-19 Pandemic

## COVID19 pandemic

PO - (AM2021-27682)

### USE OF REMDESIVIR AND ITS ADVERSE REACTIONS IN THE COVID-19 PANDEMIC.

Diana Pereira<sup>1</sup>; Maria Marmé<sup>1</sup>; Cristiano Matos<sup>1</sup>

**Keywords:** Remdesivir, Adverse effects, Action mechanism, Drug interactions, Liver damage

1 - Departamento de Farmácia, Coimbra Health School, Polytechnic Institute of Coimbra, Coimbra, Portugal

#### Background

*Remdesivir* is a pro-drug that has been shown to have antiviral activity for some RNA viruses, namely *SARS-CoV2*. This virus did not have a therapy, therefore studies have been carried out in which it is proven that *Remdesivir* reduces *COVID-19* patients recovery time. This medicine is administered intravenously, and its action mechanism is based on the action analogous to ATP, competing with its substrate. Like any drug, *Remdesivir* also has adverse effects and drug interactions. The aim of this study is to investigate the adverse reactions of *Remdesivir*, as well as its action mechanism to understand this pro-drug use in this pandemic.

#### Methods

A bibliographic research of scientific articles was carried out on *Google Scholar*<sup>®</sup>, *CENTRAL* (Cochrane Controlled Register of Trials) and *Medline* (PubMed), whose publication date varies from 2020 to the present. Keywords such as "*Remdesivir*", "*adverse effects*", "*mechanism of action*", "*drug interactions*", "*liver damage*" were used.

#### Results

After the bibliographic research, 8 articles were selected that analysed adverse reactions, with emphasis on liver injuries. Furthermore, the importance of using *Remdesivir* in patients infected with the *SARS-CoV-2* virus was analysed.

#### Conclusion

Due to the current pandemic, the use of *Remdesivir* was a very important milestone for Public Health, as it has been shown to cause a positive effect on the health of individuals hospitalized with *SARS-CoV2*. Despite this, this drug has been shown to cause liver damage in a few found studies which presents limitation for the drug prescription.

## COVID19 pandemic

PO - (AM2021-27750)

### SOCIAL REPRESENTATION OF COVID 19: A COMPARATIVE ANALYSIS

Fátima Ney Matos<sup>1</sup>; Margarida Pocinho<sup>2</sup>; Ana Amaral<sup>2</sup>

**Keywords:** COVID-19, pandemic, behaviors and dependencies, social representations

1 - Instituto Superior Miguel Torga; 2 - Escola Superior de Tecnologia da Saúde de Coimbra-IPC

#### **Background**

The COVID-19 pandemic has brought numerous challenges to our community, and several economic, social and cultural repercussions.

#### **Methods**

A qualitative analysis was performed, using the Word Evocation Test, The inducing words were Viruses and Covid-19, were performed. The data analysis was carried out, where we classified the responses according to category and domain using the SPSS23 and the Infogram software.

#### **Results**

As for the inducing word Virus, it was possible to verify a high association on the part of our sample with the current pandemic (corona and covid), its impacts (pandemic, world and health) and preventive measures (mask, quarantine and detachment) , several feelings of displeasure were also mentioned, such as panic, fear and concern, and also several terms related to microbiology, which may have occurred due to the fact that a high percentage of our sample attended the microbiology course, although the sample was for convenience. Concerning the inductive word Covid-19, a high evocation of preventive measures (mask, disinfectant and vaccine) was visible, as well as various forms of social distance (isolation and confinement), as well as negative feelings (fear and sadness) and the verbalization of countries, with China standing out in this category.

#### **Conclusion**

The social representations of university students in relation to the words Viruses and Covid-19 are related to the current pandemic situation and its negative impact. Mask and detachment are the most pronounced words for which prevention is very present in the minds of university students

## COVID19 pandemic

PO - (AM2021-27770)

### COVID-19: BENEFITS OF VITAMIN D

Ana Daniela Cruz<sup>1</sup>; Ana Margarida Fernandes<sup>1</sup>; Francisco Teixeira<sup>1</sup>; Ana Lúcia Baltazar<sup>1</sup>

**Keywords:** COVID-19, Vitamin D, Pulmonary Cytokine Storm

1 - Polytechnic Institute of Coimbra, Coimbra Health School

#### Background

Vitamin D is a steroid hormone found in many foods and also produced by the endogenous system when the sun's ultraviolet rays reach the skin and trigger its synthesis. There are several in vitro studies which report that vitamin D has many mechanisms through which it reduces the risk of microbial infection and death as it plays a vital role in "respiratory homeostasis" reducing rates of viral replication. The goal of this research is to partially understand the reasons behind the respiratory infections caused by the SARS-CoV-2 virus, and in what sense improved immunity through better nutrition through vitamin D can be an essential factor.

#### Methods

This research was constructed through scientific databases from 2020, according to the work aim.

#### Results

The severe damage caused by the SARS-COV-2 virus is due to its infection of the upper and lower airways with rapid replication of the virus and a massive inflammatory cell infiltration which produces an enormous increase in proinflammatory cytokines. Vitamin D, through its active metabolite 1.25(OH)2D, increases innate defence by antimicrobial induction of peptides such as catechycidine which lead to viral destruction and elimination by various mechanisms.

#### Conclusion

Information is limited to the potential protective factors for this infection. Currently, it is not clear how vitamin D achieves the balance between the functional state of immune responses and antiviral status in these patients. However, considering the range of beneficial immunological effects attributed to vitamin D and its safety, it is used as a supplement in therapeutic intervention in COVID-19 in critically ill patients.

## COVID19 pandemic

PO - (AM2021-27775)

### DEVELOPMENT OF A NEW VENTILATED FACE SHIELD FOR PERSONAL PROTECTION

Luis Roseiro<sup>1</sup>; Marco Silva<sup>1</sup>; Fernando Moita<sup>1</sup>; Nuno Cruz<sup>1</sup>; Nuno Lavado<sup>1</sup>; Diogo Fernandes<sup>1</sup>; Bruno Martins<sup>2</sup>; João Sobral<sup>2</sup>

**Keywords:** Covid19, Face Shield Protection, Public Health and Safety

1 - Polytechnic of Coimbra, ISEC, Coimbra, Portugal; 2 - Solien - Soluções Integradas de Engenharia, Lda, Taveiro, Portugal

#### **Background**

The COVID-19 forces society to adopt new behaviors with a direct impact on daily activities, and the use of facial or face shield masks is now a compulsory reality. In several professions, and especially in glasses users, discomfort with the use of masks or the fogging of glasses or shield can lead to the intention of not using or even endanger their use. Thus, the development of personal protective equipment that allows the comfortable use of face shields can be important to ensure that citizens will use this protection system. To guarantee comfort and safety in the use of protective masks, the development of a forced ventilated face shield is presented.

#### **Methods**

The ventilated face shield results from the work of a multidisciplinary team in the field of engineering and incorporates a production system based on additive manufacturing and electronics. The visor was designed using 3D modeling, divided into a support structure made of PETG, produced using a 3D printer, an electronic control system, a rechargeable battery with a fan, a front shield fitted with a PETG sheet, and an anchor elastic on the head.

#### **Results**

Functional tests on the device have shown adequate effectiveness, ensuring that the shield does not fog in users with face protection masks.

#### **Conclusion**

The ventilator face shield is a device that can play a relevant role in the context of fight against COVID-19, since, in addition to ensuring the necessary comfort when using a protective face shield, it allows the use of a mask without fogging.

## COVID19 pandemic

PO - (AM2021-27825)

### PHARMACOLOGICAL APPROACH OF COVID-19 IN HOSPITALIZED CHILDREN

**Adriana Matos**<sup>1</sup>; Ana Correia<sup>2</sup>; Diana Martins<sup>3,4,5,6</sup>; Fernando Mendes<sup>3,4,5,7,8</sup>; Rui Cruz<sup>1,9</sup>

**Keywords :** SARS-CoV-2, COVID-19, children, treatment

1 - Polytechnic Institute of Coimbra, ESTESC-Coimbra Health School, Pharmacy, Portugal; 2 - Department of Pediatrics, Hospital Pedro Hispano, Unidade Local de Saúde de Matosinhos; 3 - Politécnico de Coimbra, ESTeSC, DCBL, Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854 Coimbra, Coimbra, Portugal; 4 - University of Coimbra, Center for Innovative Biomedicine and Biotechnology (CIBB), Coimbra, Portugal; 5 - University of Coimbra, Coimbra Institute for Clinical and Biomedical Research (iCBR) area of Environment Genetics and Oncobiology (CIMAGO), Biophysics Institute of Faculty of Medicine, Coimbra, Portugal; 6 - - Clinical Academic Center of Coimbra (CACC), Coimbra, Portugal; 7 - Clinical Academic Center of Coimbra (CACC), Coimbra, Portugal; 8 - European Association for Professions in Biomedical Sciences, Belgium, Brussels; 9 - Centre for Health Studies & Research, University of Coimbra, Coimbra, Portugal

#### Background

COVID-19 is the disease responsible for emerging pandemic that we are living, affecting both adults and children. The disease presentation is milder in children compared to adults, having a faster recovery period and a better prognosis. Despite this, COVID-19 in children may cause serious clinical manifestations that require hospitalization, such as multisystemic inflammatory syndrome in children (MIS-C). Our aim was to describe and characterize the current pharmacological therapies available for the treatment of COVID-19 in pediatric age because published information about pharmacological treatment of COVID-19 in children is lacking.

#### Methods

We conducted a review in the online database Pubmed, using the keywords: "COVID-19", "therapeutic", "treatment", "child hospitalized", "children", "MIS-C", "PIMS-TS". We only considered studies published between November 2020 and February 2021.

#### Results

In hospitalized children with COVID-19, caution should be practiced when considering pharmacological therapy, since the benefit/risk ratio in the use of drugs in children is not proven. Various treatment options and different pharmacological agents have been used in hospitalized children, such as Remdesivir, Hydroxychloroquine, Chloroquine, Lopinavir/Ritonavir, Tocilizumab, Anakinra, Antibiotics, Interferons, and some Corticosteroids (Dexamethasone, Prednisolone, Methylprednisolone, Hydrocortisone). Only Remdesivir is approved for children with COVID-19, the remaining drugs are used *off-label*.

#### Conclusion

In the future, it is necessary to invest in research aimed at closing the information gaps about the efficacy of each pharmacological agent used for COVID-19 in children. Investigations should focus on the pharmacokinetics of the drugs, tolerability, optimal dose, the safety, and the safety profile of each, for all age groups.

## COVID19 pandemic

PO - (AM2021-27835)

### ANTIBODIES ANTI-SARS-COV-2 PREVALENCE IN A HIGHER EDUCATION INSTITUTION POPULATION

Ana Pires<sup>1</sup>; Rúben Nunes<sup>1</sup>; Carolina Melo<sup>1</sup>; Gonçalo Simões<sup>1</sup>; Inês Dias<sup>1</sup>; Patrícia Henriques<sup>1</sup>; Armando Caseiro<sup>1,2,3</sup>; Ana Valado<sup>1,2,4</sup>; Diana Martins<sup>1,5,6,7</sup>; Fernando Mendes<sup>1,5,6,7,8</sup>

**Keywords:** COVID-19, Coronavirus, SARS-CoV-2, IgM, IgG

1 - 1 - Politécnico de Coimbra, ESTeSC, DCBL, Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854 Coimbra, Coimbra, Portugal; 2 - 2- Laboratory for Applied Health Research (LabinSaúde), Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854 Coimbra, Coimbra, Portugal; 3 - 3 - Unidade de I&D “Química-Física Molecular” – Universidade de Coimbra, Coimbra Portugal; 4 - 4- Marine and Environmental Sciences Centre (MARE), Faculty of Sciences and Technology, University of Coimbra, Coimbra, Portugal; 5 - 5 - University of Coimbra, Coimbra Institute for Clinical and Biomedical Research (iCBR) area of Environment Genetics and Oncobiology (CIMAGO), Biophysics Institute of Faculty of Medicine, Coimbra, Portugal; 6 - 6 - University of Coimbra, Center for Innovative Biomedicine and Biotechnology (CIBB), Coimbra, Portugal; 7 - 7 - Clinical Academic Center of Coimbra (CACC), Coimbra, Portugal; 8 - 8 - European Association for Professions In Biomedical Sciences, Belgium, Brussels

#### Background

In December 2019 was identified the Coronavirus disease 2019 (COVID-19), which is caused by the Severe Acute Respiratory Syndrome Virus 2 (SARS-CoV-2). In March 2020, a pandemic was declared by the World Health Organization. Universities may present a risk of SARS-CoV-2 transmission, due to student movements, agglomerations, and classes. Thus, it is essential to screen this population to verify exposure to SARS-CoV-2 and ensure the safety of students.

#### Methods

A survey was used in 425 individuals, it includes data like age, temperature, and symptoms. Then, a sample of blood was taken, and ELISA was used to determine the seroprevalence of anti-SARS-CoV-2 antibodies in this population.

#### Results

Regarding the results, 3.1% were positive for IgM (n= 13), and 0.5% were positive for IgG (n=2). Correlating the results with data such as temperature, age, symptoms, or occupation, we did not verify any relationship between these and the positive values for IgM or IgG.

All positive results were retested before obtaining the final result and all individuals who were positive for IgM were subjected to the SARS-CoV-2 PCR tests to assess whether the results would be effectively positive. All were negative, indicating that serological tests had a false positive result. We can also observe that the other data used are not distinguishing factors between positivity or negativity for IgM or IgG.

#### Conclusion

The prevalence of antibodies anti-SARS-CoV-2 in the studied populations was low, and the IgM results showed to be false-positives. The two IgG positives were from previously infected persons.

## COVID19 pandemic

PO - (AM2021-27836)

### PREVALENCE OF SARS-COV-2 INFECTION IN MUNICIPALITY FROM THE CENTER OF PORTUGAL

Maria Viseu<sup>1</sup>; Rúben Nunes<sup>1</sup>; Carolina Melo<sup>1</sup>; Gonçalo Simões<sup>1</sup>; Inês Dias<sup>1</sup>; Patrícia Henriques<sup>1</sup>; Armando Caseiro<sup>1,2,3</sup>; Ana Valado<sup>1,2,4</sup>; Diana Martins<sup>1,5,6,7</sup>; Fernando Mendes<sup>1,5,6,7,8</sup>

**Keywords:** SARS-CoV-2, COVID-19, COVID-19 Serological Testing, Antibodies, Seroprevalence

1 - 1 - Politécnico de Coimbra, ESTeSC, DCBL, Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854 Coimbra, Coimbra, Portugal; 2 - 2 - Laboratory for Applied Health Research (LabinSaúde), Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854 Coimbra, Coimbra, Portugal; 3 - 3 - Unidade de I&D “Química-Física Molecular” – Universidade de Coimbra, Coimbra Portugal; 4 - 4 - Marine and Environmental Sciences Centre (MARE), Faculty of Sciences and Technology, University of Coimbra, Coimbra, Portugal; 5 - 5 - University of Coimbra, Coimbra Institute for Clinical and Biomedical Research (iCBR) area of Environment Genetics and Oncobiology (CIMAGO), Biophysics Institute of Faculty of Medicine, Coimbra, Portugal; 6 - 6 - University of Coimbra, Center for Innovative Biomedicine and Biotechnology (CIBB), Coimbra, Portugal; 7 - 7 - Clinical Academic Center of Coimbra (CACC), Coimbra, Portugal; 8 - 8 - European Association for Professions In Biomedical Sciences, Belgium, Brussels

#### Background

COVID-19 is the disease caused by the SARS-CoV-2, and the virus transmission occurs mainly through human-to-human contact by respiratory droplets. Some professions are at a higher risk of contamination due to person to person contact. Therefore it is important to screen this workers in order to know if they are/have been exposed to SARS-CoV-2, as well as to breakdown transmission chains in the community.

#### Methods

A survey (collecting data related to gender, age, profession) was handed to a sample of 420 individuals with risk professions among the 9.607 residents of Mortágua. Temperature measurement was performed also. After blood collection, immunochromatographic and immunoturbidimetric methods were used to detect antibodies (IgM and IgG) and C-reactive protein, respectively.

#### Results

The majority of the studied population (64.5%) was female and the average age of participants was of 46.29 years. The most prevalent profession was "Teachers and non-teaching staff" (30.0%). C-Reactive Protein values were mainly "<1mg/L", with a corresponding percentage of 59.0%. 99.8% of the 420 individuals tested, had a negative result on antibody screening against SARS-CoV-2, thus, the seroprevalence was 0.2%. The positive result occurred in an individual of the female gender.

#### Conclusion

Despite being a small and unrepresentative sample, this study showed that the seroprevalence of SARS-CoV-2 was low, as would be expected at the beginning of the SARS-CoV-2 pandemic.

## COVID19 pandemic

PO - (AM2021-27853)

### CREATION OF A COVID-19 DIRECT REPORTING SYSTEM FOR SCHOOLS

Diogo Queiroz Almeida<sup>1</sup>; Tomás Silva<sup>1</sup>; Gustavo Duarte<sup>1</sup>; Rachel Barbabela<sup>1</sup>; Sérgio Silva<sup>1</sup>; Márcia Balazeiro<sup>1</sup>; Jaime Baptista<sup>1</sup>

**Keywords:** COVID-19, Public Health, Information Systems

1 - Matosinhos Public Health Unit. Matosinhos. Portugal

#### Background

The identification of COVID-19 cases and contact tracing has been the focus of local public health units (PHU). The school setting has proved difficult to manage, since case information is usually attributed to the PHU of the area of residence of the COVID-19 case. This made the management of COVID-19 cases in schools difficult and untimely, since either the school reported the information (which was unstandardized, lacked relevant information, and didn't have a common channel) or another PHU had to send the information (which could be untimely, assuming it would arrive).

#### Methods

A system was developed resorting to Microsoft Forms and Microsoft Power Automate, which was released to all schools in the county. The system goes through a structured questionnaire, which provides key information to the risk evaluation of contacts. A decision is communicated in the end, with the probable course of action, which has to be validated. The PHU is informed of the submission with the risk evaluation to help prioritize the cases, according to the need of intervention in the school.

#### Results

Since implementation, over 450 submissions have been made. The system helped to streamline the entire process, which proved useful particularly during the peak of the second and third wave. The initial verbal evaluations, both internally, and with the school responsables, was positive. These evaluations were then validated resorting to satisfactory surveys.

#### Conclusion

The creation of specific and direct communication channels can help increase both the efficacy and efficiency of the response to the current pandemic.

## COVID19 pandemic

PO - (AM2021-27856)

### THE ROLE OF SCHOOL STUDENTS IN THE COVID-19 PANDEMIC – THE EXPERIENCE OF MATOSINHOS

Diogo Queiroz Almeida<sup>1</sup>; Gustavo Duarte<sup>1</sup>; Rachel Barbabela<sup>1</sup>; Nuno Rodrigues<sup>1</sup>; Tomás Silva<sup>1</sup>

**Keywords:** COVID-19, Schools, Children, Public Health

1 - Matosinhos Public Health Unit. Matosinhos. Portugal

#### **Background**

Although it has been over a year since the WHO declared the COVID-19 pandemic, some topics remain susceptible to discussion. One of them is the role of children in the transmission of the disease, with opinions diverging between a minor role to the hypothesis of being potential superspreaders. This can be particularly relevant when the decision to open or close schools is discussed, since the overall impact can be considerable.

#### **Methods**

All the cases of school students reported in January of 2021 were evaluated in the school context. These cases were evaluated in terms of basic demographic information, proportion to the total number of cases during the month in the pandemic, and secondary cases.

#### **Results**

Matosinhos has 175357 inhabitants. During January, a total of 3363 confirmed cases were reported, of which 806 (23.9%) were in children or adolescents. Of these, and after risk assessment, 116 required isolation of contacts in the school. The mean age was  $10 \pm 5$  years and there were 66 (56.9%) male students. Overall, 2079 contacts were isolated from the school grounds, and 1807 (86.9%) accepted to be tested for the SARS-CoV-2 with a RT-PCR test. A total of 98 secondary cases, without a probable link outside the school, were found, in 58 different classes (attack rate of 5.42%).

#### **Conclusion**

Children showed to be capable of transmission of the SARS-CoV-2, and should be considered as vectors of transmission when decisions are being considered where they play a major role (like the education system).

## COVID19 pandemic

PO - (AM2021-27859)

### COMPARISON OF SARS-COV-2 ANTIGEN DETECTION WITH REAL TIME RT-PCR IN A PORTUGUESE UNIVERSITY HOSPITAL

**Rita Teixeira**<sup>1</sup>; Catarina Sousa<sup>1</sup>; Sandra Fernandes<sup>1</sup>; Katherine Rodrigues<sup>1</sup>; Cristiana Pena<sup>1</sup>; Cristina Correia<sup>1</sup>; Ana Constança Mendes<sup>1</sup>; Maria Helena Ramos<sup>1</sup>

**Keywords:** SARS-CoV-2, antigen detection, RT-PCR

1 - Centro Hospitalar Universitário do Porto

#### Background

Detection of SARS-CoV-2 infection is crucial for isolation and treatment of infected patients. Although molecular methods are the most reliable diagnostic tools, detection of viral antigens is helpful for rapid screening and differentiation of contagious from non-or less contagious individuals. However, this method needs careful study for implementation in the hospital environment.

#### Methods

During July-August 2020, twenty-five nasopharyngeal samples, collected from patients attending a Portuguese hospital, with respiratory symptoms, were tested by RT-PCR with SARS-CoV-2 test™, Roche, and selected according to Cycle threshold (Ct) range between 14.48 and 37.83 for positive samples (n=19). These samples were later tested for SARS-CoV-2 antigen detection, with Standard Q COVID-19 Ag test, SD Biosensor.

#### Results

Of 25 samples tested, 6 were negative and 10 were positive by both methods. Discrepant results were observed in 9 samples, antigen negative, but positive by RT-PCR. Overall, antigen-test sensitivity was 53% and specificity was 100%. However, for samples with Ct <20 (n=11), sensitivity was 82%, as for samples with Ct>20 (n=8), sensitivity was 13%.

#### Conclusion

Antigen detection was less sensitive than PCR. The low sensitivity for samples with Ct>20 is concordant with other studies, particularly for higher Ct values. Antigen detection was negative for one sample with high viral load (Ct=14.48), possibly due to an early stage of infection rendering this a major limitation of the method.

Although antigen detection may be rapid and easy-to-perform, it is not an ideal method for diagnosis in the hospital environment, prone to outbreaks in clinical wards, where sensitivity is paramount.

## COVID19 pandemic

PO - (AM2021-27880)

### FOOD ACCESS PUBLIC POLICIES ADOPTED BY BRAZIL AND PORTUGAL DURING THE COVID-19 PANDEMIC IN 2020

Helena M A Ximenes<sup>2</sup>; Ana Angélica M Macedo<sup>1</sup>; Fernando Mendes<sup>3</sup>; Alcides F Gussi<sup>4</sup>; Nágila R T Damasceno<sup>2</sup>

**Keywords:** Food access public policies, Covid19, Brazil, Portugal

1 - Federal Institute of Maranhão, Maranhão, Imperatriz 65906335, Brazil; 2 - Public Health Faculty – University of São Paulo Av. Dr. Arnaldo, 715, São Paulo - SP, 01246-904, Brazil.; 3 - Politécnico of Coimbra, ESTeSC, Street 5 of October - SM Bispo, Separate 7006, 3046-854 Coimbra, Portugal; 4 - Agricultural Science Center - Federal University of Ceará, Av. Mister Hull, 2977 - Bloco 847 - Campus do Pici, 60356-001, Fortaleza - CE, Brazil

#### Background

It's well established that a good nutritional status is essential to maintain the immune system working properly what is especially important during a pandemic of infectious disease such as COVID-19. Thus, public policies to guarantee food access became extremely important in countries where the disease has spread as Brazil and Portugal, the two major Portuguese language economies in the world. So, this study aims to present and compare the public policies adopted by the Brazilian and Portuguese federal governments to guarantee food access and healthier food choices for their population during the COVID-19 pandemic in the year 2020.

#### Methods

A narrative review was conducted, searching for articles and official documents in PubMed and Google published from 2020 to 2021. The terms used in the search were “public policy”, “food safety”, “food insecurity”, “COVID-19”, “Brazil”, and “Portugal”. Nine articles were selected, two of them about Portugal.

#### Results

In Portugal, a governmental program produced educational material to maintain optimal nutrition at different levels, aiming to maintain a healthy food habit and to treat the ones infected by COVID-19. In Brazil, this kind of initiative was provided at first by private and social institutions and in the second moment by the government. Just before the pandemic, the Brazilian federal government applied budget cuts and institutional dismantlement, especially the ones related to nutrition safety.

#### Conclusion

The main difference between the countries included the timing of the government responses and the fact that in Portugal prevailed coordinated actions, which didn't happen in Brazil.

## COVID19 pandemic

PO - (AM2021-27885)

### SARS AND MERS LABORATORY DIAGNOSTIC METHODS

**Carolina Melo**<sup>1</sup>; Rúben Nunes<sup>1</sup>; Diana Martins<sup>1,2,3,4</sup>; Fernando Mendes<sup>1,2,3,4</sup>

**Keywords:** SARS Virus, Middle East Respiratory Syndrome Coronavirus, Clinical Laboratory Techniques

1 - Politécnico de Coimbra, ESTeSC, DCBL, Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854 Coimbra, Coimbra, Portugal; 2 - University of Coimbra, Coimbra Institute for Clinical and Biomedical Research (iCBER) area of Environment Genetics and Oncobiology (CIMAGO), Biophysics Institute of Faculty of Medicine, Coimbra, Portugal; 3 - University of Coimbra, Center for Innovative Biomedicine and Biotechnology (CIBB), Coimbra, Portugal; 4 - Clinical Academic Center of Coimbra (CACC), Coimbra, Portugal

#### Background

Coronaviruses (CoVs) can cause severe respiratory syndromes, such as Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). SARS-CoV appeared in 2002 with a fatality rate of 9.6% and MERS-CoV led to a higher fatality rate of 34.4%, ten years later. The aim of this review is to summarize the outcome of SARS-CoV and MERS-CoV diagnostic assays in assessing their sensitivity and specificity, thus improving the laboratory diagnoses.

#### Methods

This systematic review includes 33 studies and was performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. The literature is available on the indexed search engine “PubMed” and the selected keywords were “SARS Virus”, “Middle East Respiratory Syndrome Coronavirus”, “Clinical Laboratory Techniques”, “Molecular Diagnostic Techniques”, “Serologic Tests” and “Antigen Detection” according to Medical Subject Headings Mesh.

#### Results

RT-PCR and RT-qPCR assays targeting two genomic regions revealed sensitivities and specificities close to 100%. The sensitivity of serologic tests fluctuates according to the number of days after the onset of the first symptoms and its specificity is low. The N antigen-capture diagnostic method showed a sensitivity of 93.9% and specificity of 99.6%, compared to RT-qPCR.

#### Conclusion

Serologic tests constitute an important tool for patient follow-up once they allow a retrospectively assess of infection and antigen tests can be used as a screening test since they have a good specificity, however, RT-PCR will always be considered the “gold standard” in the diagnosis since it has the best specificities and sensitivities.

## COVID19 pandemic

PO - (AM2021-27890)

### TMA SARS-COV-2 RNA DETECTION IN PLASMA OF COVID-19 CRITICALLY ILL PATIENTS

Célia Ferreira<sup>1</sup>; Cristina Isabel Pereira<sup>1</sup>; Inês Figueiredo<sup>1</sup>; Andreia Baptista<sup>1</sup>; António Martins<sup>1</sup>; Maria Faria<sup>1</sup>; José Fernández<sup>1</sup>; Jorge Tomaz<sup>1</sup>

**Keywords:** plasma, nasopharyngeal exudate, Transcription-Mediated Amplification, SARS-CoV-2 RNA, PCR

1 - Serviço de Sangue e Medicina Transfusional (SSMT), Centro Hospitalar e Universitário de Coimbra (CHUC), Coimbra. Portugal

#### Background

SARS-CoV-2 RNA can be detected initially in the upper respiratory tract, 1 to 2 days before the onset of symptoms and can persist for 7 to 12 days in moderate cases and up to 2 weeks in severe cases. SARS-CoV-2 RNA viremia can also be detected in blood of some patients with COVID-19.

#### Methods

Seventeen critically patients confirmed diagnosed with SARS-CoV-2 infection were included in this study. SARS-CoV-2 RNA was screened by transcription-mediated amplification (TMA) of plasma samples from patients, with SARS-COV-2 RNA detectable by PCR in nasopharyngeal exudate samples. Serological tests were also carried out to detect IgG and IgM antibodies against SARS-CoV-2.

#### Results

Regarding the TMA, there were 8 positive (47%), 5 doubtful (29%) and 4 negative (24%) samples. As for serological tests, there were 14 positive samples (82%) and 3 negative (18%).

#### Conclusion

The results were consistent in 76% (47% + 29%) between the plasma samples and nasopharyngeal exudate samples even with a collection interval of 31days. The discordant results (24%) can be explained with the difference between harvest dates of PCR and TMA, due to the lack of knowledge of the infection phase combined with the presence and viral load of the virus in blood.

Samples where no SARS-CoV2 IgG / IGM antibodies were detected were positive for PCR and TMA tests.

## COVID19 pandemic

PO - (AM2021-27891)

### DIRECT ANTIGLOBULIN TEST IN PATIENTS WITH COVID-19

Maria Faria<sup>1</sup>; Célia Ferreira<sup>1</sup>; Andreia Baptista<sup>1</sup>; Inês Figueiredo<sup>1</sup>; Cristina Isabel Pereira<sup>1</sup>; António Martins<sup>1</sup>; Ana Esumaga<sup>1</sup>; Jorge Tomaz<sup>1</sup>

**Keywords:** Direct Antiglobulin Test, COVID-19, hemolytic anemia

1 - Serviço de Sangue e Medicina Transfusional (SSMT), Centro Hospitalar e Universitário de Coimbra (CHUC), Coimbra. Portugal.

#### Background

Coronavirus disease 2019 (COVID-19), is the disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Results of a recent study shows that a high percentage of patients with COVID - 19 present a positive Direct Antiglobulin Test (DAT), specific for IgG, however without evidence of hemolytic anemia.

#### Methods

152 patients from CHUC were studied, of which 35 were confirmed to have SARS-CoV-2 infection confirmed by RT-PCR (reverse transcriptase polymerase chain reaction) and another 117 with undetectable SARS-CoV-2. All samples were DAT performed by BioRad analyzer IH-1000, BioRad ID-Card LISS / Coombs techniques.

#### Results

In patients with COVID-19, there were 18 patients (51.4%) with reactive results for DAT, of which 66.6% are of the IgG type and only 5.5% for complement C3d and 94, 4% had a negative Indirect Antiglobulin Test (IAT). In patients without COVID-19 infection, only 5.13% had positive DAT.

#### Conclusion

We found a higher number of positive DAT cases in patients with COVID-19 compared to non-infected patients. These data were suggested by an association of DAT with an infection with SARS-CoV-2, whose pathogenesis is not yet known. The results obtained agree with other studies already published. Further studies are needed to understand the real meaning of a positive DAT in COVID-19: infection, therapy or changes in the erythrocyte membrane.

## COVID19 pandemic

PO - (AM2021-27841)

### LOVE IN TIMES OF PANDEMIC: APPROXIMATIONS AND DISTANCES

Manuel Bandeira dos Santos Neto<sup>1</sup>; Ana Angélica Mathias Macêdo<sup>2</sup>; Fernando Mendes<sup>3</sup>

**Keywords:** pandemic, social distancing, Covid-19

1 - Universidade Federal Rural de Pernambuco; 2 - Instituto Federal do Maranhão; 3 - Instituto Politécnico de Coimbra - Escola Superior de Tecnologia da Saúde de Coimbra - Departamento de Ciências Biomédicas Laboratoriais

#### Background

Love is considered a physical phenomenon, the result of attraction between two people. As a result of that attraction, the expression “chemistry occurred” is commonly used. It is known that this fascination is the result of the action of chemical substances called neurotransmitters that stimulate and react in our organism to contact, smell and touch between people. According to the mentioned, this research aims to present some effects of the pandemic to discuss approximations and distances in romantic relationships as a result of social distancing.

#### Methods

To achieve the above, a bibliographic search was made in journals and books.

#### Results

From this, it was noticed that from the second half of 2020, the number of divorces was the highest recorded in Brazil. According to the Brazilian Institute of Geography and Statistics, this number has grown by 75% in the last 5 years, with an increase of 260% in July 2020, in relation to previous months. Many surveys indicate that this high rate is related to intense coexistence of couples due to social isolation imposed by Covid-19. However, researcher Helen Fisher says that strong coexistence can strengthen romantic relationships, being a determining factor to differentiate attraction and love. This approximation or distance is linked to the production (or lack) of neurotransmitters such as dopamine, serotonin and vasopressin.

#### Conclusion

Therefore, this work strengthens the discussions around the strong coexistence due to social isolation and its consequences for romantic relationships, having impacts in the area of mental health.

Healthy lifestyles and health education

## Healthy lifestyles and health education

PO - (AM2021-27629)

### ADHERENCE TO THE MEDITERRANEAN DIET AND CHARACTERIZATION OF THE ANTHROPOMETRIC PROFILE OF YOUNG ATHLETES

Teresa Ferreira<sup>1</sup>; Helena Loureiro<sup>1</sup>; Margarida Pocinho<sup>1</sup>

**Keywords:** Mediterranean Diet, Obesity, Nutrition Status, Young Athletes

1 - Coimbra Health School, Polytechnic of Coimbra

#### Background

Soccer nutrition is crucial for a better sports performance and the Mediterranean Diet is proven to be one of the most adequate to ensure the supply of all nutrients in different age groups, promoting the development of the athlete's physical capacities. Thus, the aim of the present study is to characterize the anthropometric profile and the prevalence of overweight and obesity, as well as to evaluate the adherence to the Mediterranean Diet.

#### Methods

The study included 33 young male Portuguese soccer players from Vitória Sport Clube in 2019/2020 season, aged between 10 and 12 years old. Weight and height were determined, through which the Body Mass Index was calculated, and the waist circumference to determine the quotient between it and height *Waist-to-height ratio* index. It was also applied by indirect administration, a questionnaire about sociodemographic characteristics and adherence to the Mediterranean Diet, KIDMED<sup>®</sup> index.

#### Results

From the anthropometric assessment, 63,6% presented appropriate weight, 33,3% were overweight and 3,0% were obese. Regarding the waist circumference, only 3,0% of the sample was above normal. As for the KIDMED<sup>®</sup> questionnaire, 85,0% had high adherence to the Mediterranean Diet and the remaining 15,0% had moderate adherence, no one had low adherence.

#### Conclusion

The prevalence of overweight and obesity was 36,3% and the vast majority had high adherence to the Mediterranean Diet. The focus on dietary education should be considered as a major nutritional strategy to maximize sports performance.

## Healthy lifestyles and health education

PO - (AM2021-27663)

### SKIN CANCER PREVENTION: PHOTOTYPES AND SPF

Ana Paula Fonseca<sup>1</sup>; Vera Galinha<sup>1</sup>

**Keywords:** Skin cancer, prevention, skin phototypes, SPF

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Pharmacy Department, Rua 5 de Outubro, S. Martinho do Bispo, 3046-854 Coimbra, Portugal

#### Background

According to the World Health Organization (WHO), an increase in non-melanoma and melanoma skin cancer has increased in recent decades. Currently, between 2 and 3 million non-melanoma skin cancers and 132,000 melanoma skin cancers occur globally each year.

Skin pigmentation is the main defense factor against the harmful action of solar radiation. But, not all people synthesize the same amount of melanin, for this reason there are different skin phototypes.

According to the Portuguese Association of Skin Cancer (APCC), the incidence of various types of skin cancer has been increasing due, essentially, to an exaggerated or inadequate sun exposure, favoring skin cancers.

Each skin type has an ideal sun protection factor, sunscreens represent an effective way to prevent sunburn, photoaging and especially skin cancer. However it is also important that other cares for sun protection is truly complete in prevention.

#### Methods

The literature review was carried out by means of a bibliographic survey, through research in the databases PubMed, Google Scholar, ScienceDirect and Wiley Online Library, between 2015 and 2020.

#### Results

The SPF represents the effectiveness of a sunscreen formulation. These products should absorb the majority of UV radiation (290 to 400 nm) so as to be effective in preventing skin cancer, wrinkle formation, photo ageing, sunburn and other skin damages.

#### Conclusion

To prevent the skin cancer, we have to encourage the correct use of sunscreen vs skin phototype vs SPF, reapplication and double-application to reach a desirable effect of the sunscreen and promote the use of other physical protection.

## Healthy lifestyles and health education

PO - (AM2021-27710)

### NUTRITIONAL PROFILE AND COMPOSITION OF FOODS FOR CHILDREN AGED 0 TO 36 MONTHS MARKETED IN THE CITY OF NATAL/RN

CRB Araujo<sup>1,2</sup>; KF Rocha<sup>3</sup>; KDS Ribeiro<sup>4</sup>; BR Carneiro<sup>5</sup>; AF Oliveira<sup>6</sup>; P Padrão<sup>7,8</sup>; P Moreira<sup>7,8,9</sup>

**Keywords:** Food composition, Food labeling, Nutritional profile

1 - Faculdade de Ciências da Nutrição e Alimentação, Universidade do Porto, Porto, Portugal; 2 - Universidade Federal do Rio Grande do Norte(UFRN) Natal, RN - Brazil; 3 - Programa de Pós-Graduação em Nutrição, Universidade Federal do Rio Grande do Norte(UFRN)Natal, RN - Brazil; 4 - Universidade Federal do Rio Grande do Norte (UFRN),Natal,Brazil.; 5 - Universidade Federal do Rio Grande do Norte (UFRN),Natal Brazil; 6 - Universidade Federal do Rio Grande do Norte (UFRN),Natal Brazil.; 7 - Faculdade de Ciências da Nutrição e Alimentação, Universidade do Porto, Porto, Portugal.; 8 - EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Porto, Portugal.; 9 - Centro de Investigação em Atividade Física, Saúde e Lazer, Universidade do Porto, Portugal

#### Background

Information on the nutritional profiles and composition of industrialized foods and beverages that are specifically labeled for children is very important. To evaluate the nutritional profile of commercial foods for children aged 0-36 months, in the city of Natal-RN, Brazil, according the Pan American Health Organization Nutrient Profile Model (PAHONP), 2016.

#### Methods

An exploratory cross-sectional study was carried out in Natal-RN, Brazil, based on the World Health Organization protocol on the availability and nutritional composition of commercial food products for children aged 0 to 36 months. Food labels available in all retail stores, in socio-demographically distinct areas of advantage, were used to collect nutritional composition (energy, total carbohydrates, free sugars, total fat, saturated and trans and sodium).

#### Results

Twenty-four foods were analyzed, including 16 soups and 8 fruit/vegetable purees. Regarding nutrition composition the mean ( $\pm$ SD) per 100g was: The average energy content was 69 kcal ( $\pm$ 11), 2.1g ( $\pm$  1.6) for total fat, 0.34g ( $\pm$  0.3) for saturated fat, 6.0g ( $\pm$  4.1) for total carbohydrates, 3.0g ( $\pm$  1.2) for free sugars, corresponding to 27.0%, 4.4%, 34.8% and 1.6% of the Total Energy Value respectively. The content of sodium per 100g was 49mg ( $\pm$ 56.3) corresponding to 0.7mg/kcal. No food had sweeteners or trans fats in its composition. The percentage of foods above PAHONP cut-offs were 0% for sodium and saturated fat .

#### Conclusion

The composition of the evaluated of commercial food products for children aged 0 to 36 months in Natal, Brazil was within the criteria of the free sugars, sodium, total fat and saturated by PAHONP.

## Healthy lifestyles and health education

PO - (AM2021-27743)

### BRAIN ACTIVATION CHANGES DURING COGNITIVE DUAL-TASK: COMPARISON BETWEEN YOUNG ADULTS WITH DIFFERENT LEVELS OF PHYSICAL ACTIVITY

**Marina Saraiva**<sup>1,2</sup>; João Paulo Vilas-Boas<sup>5,6</sup>; Maria António Castro<sup>1,3,4</sup>

**Keywords:** cognitive dual-task, physical activity, prefrontal cortex, cerebral oxygenation, fNIR

1 - Robocorp Laboratory, Polytechnic Institute of Coimbra; 2 - Faculty of Sports of the University of Porto; 3 - CEMMPRE, University of Coimbra; 4 - ESTESC-Coimbra Health School; 5 - LABIOMEP- University of Porto; 6 - Faculty of Sports (CIFI2D) of the University of Porto

#### Background

Previous studies suggest that physical activity can modify the hemodynamics response and cerebral oxygenation. The aim of this study was to compare the oxygenated hemoglobin concentration ([HbO<sub>2</sub>]) during cognitive dual-task between young adults with different levels of physical activity.

#### Methods

Thirty-two participants (age=23.13±3.92 years, mean ± SD) were subjected to a cognitive dual-task, consisting of quiet standing while performing a concurrent cognitive task (arithmetic and memory tasks). The subjects used functional near-infrared spectroscopy (fNIRS) during task performance, where oxygenated hemoglobin concentration ([HbO<sub>2</sub>]), deoxygenated hemoglobin concentration ([HHb]), and total hemoglobin (HbTotal=HbO<sub>2</sub> + HHb) were measured in the prefrontal cortex. The International Physical Activity Questionnaire (IPAQ) – short version – was used to assess the levels of subjects' physical activity. After data processing, the Kruskal-Wallis test was used for comparison.

#### Results

According to IPAQ, in this sample, 46.9% are highly active, 37.5% minimally active and 15.6% inactive. No association between levels of physical activity and oxygenated hemoglobin concentration ( $p>0.05$ ) in young adults was found during cognitive dual-task. Hemoglobin total did not differ between the different levels of physical activity during cognitive dual-task.

#### Conclusion

These findings suggest that different levels of activity don't interfere with the oxygenated hemoglobin concentration and the hemoglobin total during cognitive dual-task in young adults. However, it should be noted that most participants had a high level of physical activity compromising the comparison between the different levels of physical activity and hemodynamic response in the prefrontal cortex.

## Healthy lifestyles and health education

PO - (AM2021-27754)

### EPIDEMIOLOGY AND TREATMENT OF CUTANEOUS MELANOMA

Anabela Andrade<sup>1</sup>; Jorge Balteiro<sup>1</sup>

**Keywords:** Melanoma, Epidemiology, Prognosis, Combination therapy, Targeted therapy

1 - ESTeSC - Coimbra Health School, Instituto Politécnico de Coimbra, Portugal.

#### Background

Cutaneous melanoma is a malignant tumor that occurs in melanocytes, which is highly heterogeneous, with a high rate of metastasis and a poor prognosis. Its incidence increases annually, and the main factor may be climate change. It is a cancer highly associated with genetic mutations, very dangerous and lethal, due to its ability to metastasize, reaching easily the circulatory, lymphatic system and other parts of the body. Resistance to therapy and its toxicity are one of the main causes of failure of anti-tumor therapy. The cost associated with the treatment of metastatic melanoma has increased and is currently considered one of the most expensive cancers to be treated. For all its characteristics it has gained the attention of the scientific community.

#### Methods

The present work is a review of the oncological disease Melanoma and its epidemiology. The research was carried out online in databases and pages of official entities, considered credible and relevant to the study of the theme. 36 references were used.

#### Results

The most developed regions have the highest incidence rates of the disease. Light-skinned individuals have a higher risk of developing the disease. Males are more prone to melanoma and mortality is higher in middle-aged individuals and in the elderly.

#### Conclusion

Despite all the fantastic advances in the treatment of melanoma, there are still many challenges to be faced in the future. The future in the treatment of melanoma may involve personalized medicine and prevention depends on the behavior of each individual.

## Healthy lifestyles and health education

PO - (AM2021-27787)

### MOTOR TASK PERFORMANCE DURING SMARTPHONE USE ON STATIC AND DYNAMIC POSTURAL CONTROL IN YOUNG ADULTS

Marina Saraiva<sup>1,2</sup>; Maria António Castro<sup>2,3,4</sup>; João Paulo Vilas-Boas<sup>1,5</sup>

**Keywords:** motor dual-task, motor performance, motor skills, smartphone

1 - Faculty of Sports of the University of Porto; 2 - Robocorp Laboratory, Polytechnic Institute of Coimbra; 3 - CEMMPRE, University of Coimbra; 4 - IPL-Leiria Health School, Portugal; 5 - LABIOMEPE- University of Porto

#### Background

Performing two or more tasks simultaneously is frequently associated with a performance decline in one or both tasks. The smartphone use while walking was associated with increased physical demands related to manipulation of the smartphone. The aim of the study was to compare motor tasks performances using a smartphone during static postural control and gait in young adults.

#### Methods

Thirty-six healthy participants (age=23.25±4.04 years, mean±SD) were instructed to perform two different motor tasks using a smartphone while walking and standing. The motor tasks consisted of typing on the smartphone keyboard (texting a message) and taking the smartphone out of the bag, bringing it to the ear and putting it back in the bag (answer the smartphone). The performance of each motor task was assessed by the number of characters written in the message and the number of times the smartphone was answered during walking and quiet standing position.

#### Results

The motor tasks performance was greater during quiet standing position than walking. The number of characters in the message during the typing on the smartphone while walking task was lower compared to the typing on the smartphone while standing task ( $p=0.005$ ). The number of times the smartphone was taken out of the bag, brought to the ear and put back in the bag was greater during quiet standing position than walking task ( $p=0.004$ ).

#### Conclusion

The motor tasks performance, answering the phone or texting, was worst during the gait, which can represent that the gait requires more attentional resources, head control and dynamic stability.

## Healthy lifestyles and health education

PO - (AM2021-27800)

### INFLUENCE OF AN AQUATIC EXERCISE PROGRAM ON PULMONARY FUNCTION IN INDIVIDUALS WITH ANKYLOSING SPONDYLITIS

Sofia Lopes<sup>1,2,3</sup>; Paula Santos<sup>1,4</sup>; João Borges<sup>1</sup>; Inês Ferreira<sup>1</sup>; Conceição Graça<sup>5</sup>; Ana Henriques<sup>5</sup>; Cristina Mesquita<sup>1,3</sup>

**Keywords:** Rheumatic disease, physical exercise, pulmonary function

1 - Escola Superior de Saúde - IPPorto; 2 - Escola Superior de Saúde Vale do Sousa; 3 - Centro de Investigação e Reabilitação; 4 - Centro de Investigação em Atividade Física, Saúde e Lazer - CIAFEL; 5 - Escola Superior de Saúde de Aveiro, Universidade de Aveiro

#### Background

Ankylosing spondylitis (AS) is a chronic systemic rheumatic disease of an inflammatory nature that affects the axial skeleton and progressively leads to structural and functional changes that can result in impairment of the respiratory system, namely a decrease in pulmonary function. The objective is evaluate the influence of a specific aquatic exercise program on the pulmonary function of individuals with AS, through the maximum inspiratory and expiratory pressure values (PIM and PEM), chest expansion, forced vital capacity, and their impact on the Bath indices.

#### Methods

The study was classified as pre-experimental, presenting a sample composed of 7 participants. Two assessment moments were performed (M0 and M1) and as assessment instruments, Bath indices were used, a spirometer to assess pulmonary function parameters, a manovacuometer to measure PIM and PEM and the measurement of chest expansion was performed. For statistical treatment, we used the Statistical Program Statistical Package for the Social Sciences (SPSS), and 0.05 was assumed as a significance value.

#### Results

Between evaluation moments, there were statistically significant differences in peak expiratory flow values ( $p=0.028$ ), chest expansion ( $p=0.044$ ), PIM ( $p=0.042$ ), PEM ( $p=0.018$ ), Bath Ankylosing Spondylitis Metrology Index ( $p=0.028$ ) and Disease Activity Index ( $p=0.018$ ).

#### Conclusion

In this study, there was an increase in values in parameters of pulmonary function, mobility and a decrease in disease activity.

## Healthy lifestyles and health education

PO - (AM2021-27824)

### STUDENTS LIFESTYLE: CASE STUDY IN PORTUGAL AND BRAZIL HIGHER EDUCATION

Cecília Fonseca<sup>1,2</sup>; Ermelinda Marques<sup>1,2,3,4</sup>; Renata Saraiva<sup>5</sup>; Agostinha Corte<sup>6,7</sup>

**Keywords:** Lifestyle, Health promotion, Higher education students

1 - Instituto Politécnico da Guarda;; 2 - Unidade de Investigação para o Desenvolvimento do Interior; 3 - Centro de Investigação em Tecnologias e Serviços de Saúde; 4 - Centro Académico Clínico das Beiras; 5 - 3Universidade Estácio de Sá, Brasil; 6 - Instituto Politécnico da Guarda, Portugal; 7 - Unidade de Investigação para o Desenvolvimento do Interior, Portugal

#### Background

The lifestyle adopted by individuals plays an important role in promoting and protecting their health and quality of life. At this level, with the entry into higher education, young people face several challenges, often accompanied by significant changes in their lifestyles. Thus, the aim of the study was to investigate lifestyle of two communities of higher education students, Portuguese and Brazilian, to support the development of strategies to promote healthy behaviour.

#### Methods

To assess students' lifestyle, the questionnaire "Fantastic Lifestyle" was distributed to all students, by electronic mail, and was available online in the years 2017 and 2018. A cross-sectional study was carried out.

#### Results

The sample consisted of 543 Portuguese students, 70.2% female, mean age 22.6 years (SD = 5.9); and 702 Brazilian students, 85% female, mean age 24.9 years (SD = 7.4).

The responses obtained through the tool "Fantastic Lifestyle" questionnaire showed that the majority (54.1%) of the students in Portugal classified the Lifestyle as very good, followed by good (28%), the regular (9.9 %) and the excellent (7.9%). Brazilian students rated Lifestyle as good (34.2%) and very good (32.5%), followed by regular (27.5%) and, with less occurrence, the excellent (4.4%) and needs to improve (1.4%).

The areas that are highlighted by the fact that it requires intervention in Portugal were tobacco and alcohol, and Brazil nutrition, sleep and stress.

#### Conclusion

The results allowed to evaluate the lifestyles in the two communities of students and to identify the dimensions that stood out negatively, as well as outline intervention strategies.

## Healthy lifestyles and health education

PO - (AM2021-27827)

### EFFECTS OF RADIOFREQUENCY AND SHOCK WAVES ON ABDOMINAL FAT

**Bianca Bacelar**<sup>1</sup>; Cecília Rodrigues<sup>1</sup>; Teresa Moreira<sup>1</sup>; Marlene Mota<sup>1,2</sup>; Andreia Noites<sup>1</sup>; Manuela Amorim<sup>1,2</sup>

**Keywords:** lipid metabolism, adipose tissue, lipolysis, radiofrequency, shock waves

1 - ESS|P.Porto; 2 - CISA

#### Background

Abdominal obesity is a major risk factor for cardiovascular and metabolic diseases development. The combination of techniques as radiofrequency (RF) or shockwave (SW) therapy with aerobic exercise can contribute to lipolysis activation and decrease excess abdomen fat. The main aim was to compare the effects of RF with those of SW therapy on lipolytic activity associated with moderate aerobic exercise.

#### Methods

Thirty participants were randomly allocated in two experimental groups (EG1 and EG2) and one control group (CG). Three questionnaires were used to sample characterization: the sociodemographic, International Physical Activity and Food Frequency Semiquantitative. Groups did radiofrequency or abdominal shock wave therapy followed by moderate aerobic exercise. Data of the biochemical profile were collected in three moments: before intervention (M0), after three (M1) and six (M2) sessions. For the statistical analysis was used a significance level of 0.05.

#### Results

There were no changes in lipid profile of all groups after interventions ( $p > 0.05$ ), except for triglycerides in GE1 between the intervention times M2 ( $129.20 \pm 37.62$  mg/dL) compared to M0 ( $69.72 \pm 31.18$  mg/dL) and M1 ( $75.58 \pm 26.60$  mg/dL). There were no significant differences in glycerol concentrations ( $p > 0.05$ ). These results indicate that the techniques used in association with physical exercise do not promote an increase in lipolytic activity.

#### Conclusion

In the present study, RF and SW therapy are effective in rapidly reducing fat and excess weight when combined with physical exercise. The application of these techniques appears to be a safe cardiometabolic intervention.

## Healthy lifestyles and health education

PO - (AM2021-27857)

### PROPOSAL OF CRITERIA FOR QUALITATIVE EVALUATION OF A VEGETARIAN LUNCH MENU IN CANTEENS AND PUBLIC CAFETERIAS

Catarina Camacho<sup>1</sup>; Carolina Gomes<sup>3</sup>; Ana Lúcia Baltazar<sup>2</sup>; Sónia Fialho<sup>2</sup>

**Keywords:** Qualitative evaluation, Vegetarian Diet, Vegetarian Menus, Cafeterias

1 - Trainee nutritionist at Serviços de Ação Social - IPC; 2 - Associated Professor in Coimbra Health School - Portugal; 3 - Trainee Student of the Degree in Dietetics and Nutrition at Coimbra Health School - Portugal

#### Background

In Portugal with the entry into force of the Law nº 11/2017 of April 17, it became mandatory to offer a vegetarian option in canteens and public cafeterias. However, the poor nutritional quality of meals served in these places has been observed, and most often do not comply the nutritional needs of individuals with a vegetarian diet. The present work aims to develop a qualitative assessment methodology for vegetarian menus in order to improve their offer and quality.

#### Methods

For the elaboration of this tool, the proposal of criteria for qualitative evaluation of menus and technical documents on general principles for vegetarian meals of the National Program for the Promotion of Healthy Eating was used as a base. Taking into account the relevance of the items to be evaluated, the score for each one was worked on, in order to allow the qualitative classification of the menu.

#### Results

From the base principles for a healthy vegetarian diet, 30 parameters were obtained, framed in 6 distinct analysis groups. Each parameter was assigned a score between 1 and 3 points according to the degree of relevance, with a score of 1 being attributed to the less relevant items and 3 for the most pertinent items (the sum of the values assigned to each item makes a total of 63 points).

#### Conclusion

This tool allows a uniformity of the qualitative evaluation of vegetarian menus, simplifying their assessment, and consequently facilitating the improvement of the food and nutritional quality of vegetarian meals.

Public health and environment

## Public health and environment

PO - (AM2021-27850)

### WASTE PREVENTION IN THE CENTRAL SERVICES OF THE POLYTECHNIC OF COIMBRA

António Loureiro<sup>1</sup>; Sílvia Seco<sup>1</sup>; Ana Ferreira<sup>1</sup>

**Keywords:** Polytechnic of Coimbra, Sustainable Development, Waste Prevention

1 - Polytechnic of Coimbra, Occupational and Environmental Health Service, Rua da Misericórdia, Lagar dos Cortiços - S. Martinho do Bispo, 3045-093 Coimbra, Portugal

#### Background

Urbanization, economic development and population growth have significantly contributed to the production of waste. More is produced, more is consumed and, consequently, more waste is generated. This situation has contributed to the degradation of the environment in which we live and the proper management of Urban Waste started to assume a prominent role from an environmental and public health point of view.

Acting in the improvement of Waste Management in the Central Services (CS) of the Polytechnic of Coimbra (IPC).

#### Methods

This study presents the evolution of waste management in the CS of the IPC, from June 5, 2019 to April 30, 2021.

#### Results

It was found that, of these, 46.90% were undifferentiated waste, 44.14% paper/cardboard, followed by plastic waste (3.92%), coffee capsules (3.23%) and, finally, glass (1.82%). It should be noted that coffee capsules only started to be separated in January 2020. With the promotion of waste separation at the studied location, it was possible to send 2,989.80 kg of waste to an appropriate final destination that would otherwise go to landfill.

#### Conclusion

The separation of waste for recycling has several environmental, economic and social advantages, such as saving water and energy and reducing the extraction of raw materials, waste treatment fees and the impacts of landfills and incineration. Nevertheless, there is still a path that is being covered in order to promote its prevention and continuous improvement.

Nutrition and noncommunicable diseases

## Nutrition and noncommunicable diseases

PO - (AM2021-27645)

### INFLUENCE OF THE CIVIL STATE ON THE QUALITY OF LIFE OF PEOPLE WITH DIABETES

Catarina Gomes<sup>1</sup>; Inês Rosendo<sup>1</sup>; José Augusto Simões<sup>2</sup>

**Keywords:** Diabetes Mellitus, Quality of Life, Marital Status

1 - University of Coimbra, Faculty of Medicine; 2 - Coimbra Health School

#### Background

Diabetes mellitus is a group of metabolic diseases characterized by chronic hyperglycemia. The disease and its complications results not only in medical costs but in worse health perception. The perception of health/health-related quality of life is influenced by sociodemographic factors. Aim: Measure the perception of mental and physical health in diabetic patients and the influence of their marital status and other sociodemographic factors.

#### Methods

Cross-sectional observational study with a convenience sample of patients with DM from Family Health Units. It was performed after the medical consultation and informed consent through an interview. The questionnaire was about sociodemographic and clinical characterization. The perception of health was measured by *12-Item Short-Form Health Survey*.

#### Results

Sample of 60 individuals, 58.3% male gender, presenting a mean of age 68,88±13,85 years. The majority was married or in a civil union (68.3%), had lower levels of education (63,3%), were Christians (96,7%), retired (71,7%) and tendentially with lower socioeconomic status (15%). The perception of mental and physical health related with marital status was not statistically significant. There was a weak negative correlation with statistical meaning between the perception of health and the age of the patients. Only the perception of physical health was associated with statistical meaning in gender and educational level. There was no association with statistical meaning in the perception of health related to employment status, religion and socioeconomic status.

#### Conclusion

The study didn't reveal an association of marital status and the perception of health probably because of the small size of the sample.

## Nutrition and noncommunicable diseases

PO - (AM2021-27722)

### EVOLUTION OF TENSIONAL PROFILE IN YOUNG WOMEN – ABPM STUDY

Joaquim Pereira<sup>1</sup>; Mara Resende<sup>1</sup>; Silvia Santos<sup>2</sup>; Telmo Pereira<sup>1</sup>

**Keywords:** Obesity, Arterial Hypertension, Ambulatory blood pressure monitoring, IMC

1 - ESTESCoimbra; 2 - CHUC

#### **Background**

Hypertension is considered to be one of the main factors responsible for the high number of cardiovascular complications. This manifestation is associated, in most cases, with unhealthy lifestyles and poor eating habits. Increasingly, society has adopted practices that harm your health, especially when it comes to food and sedentary lifestyle.

As a result of these bad habits, obesity has increased its incidence in recent years, thus appearing at an earlier stage in life. Arterial hypertension is the biggest risk factor for diseases of the cardiovascular system, however it is also the one that we can most easily modify and reverse, so it is important to review our habits.

The objective of the present study was to evaluate the relationship between body mass index and blood pressure values and its variables derived from ambulatory blood pressure monitoring.

#### **Methods**

This study was carried out with data on 40 female individuals, using a pre-existing database with ages between 18 and 49 years old. The diagnosis of hypertension was made using ambulatory blood pressure monitoring (ABPM), which does not have several indirect blood pressure over 24 hours.

#### **Results**

The prevalence of hypertension was 52.5%, does not present our statistical results significant data.

#### **Conclusion**

In this study, BMI values did not have major changes in blood pressure, however it was possible to demonstrate a positive relationship between the presence of arterial hypertension and the increased body mass index.

## Nutrition and noncommunicable diseases

PO - (AM2021-27771)

### DISCRIMINATION OF GLUTEN VS GLUTEN-FREE PRODUCTS BY NUTRITIONAL COMPOSITION AND COST

Beatriz Ferreira<sup>1</sup>; Bruna Pinheiro<sup>1</sup>; João Lemos<sup>1</sup>; Diogo Martinho<sup>1</sup>; Ana Lúcia Baltazar<sup>1</sup>

**Keywords:** gluten-free, celiac disease, nutritional composition, cost

1 - Polytechnic Institute of Coimbra, Coimbra Health School

#### Background

The benefits of gluten-free food associated with celiac disease are well described in the literature. However, the gluten-free food is frequently consumed by general population because it is described with a positive impact in well-being and loss weight programs. The aim of current study is to analyze nutritional components and food cost of products with gluten and gluten-free (n=57).

#### Methods

Ten main categories of products were considered and their nutritional composition was derived from labels and available information provided by commercial superficies. Mann-Whitney test was used to test the differences between groups.

#### Results

The results showed no significant differences in different parameters. Note, that the gluten products presented higher content of protein than gluten-free food (with gluten:  $9.01 \pm 1.03$ ; gluten-free:  $3.6 \pm 0.32$ ,  $p < 0.05$ ). The cost of gluten-free food was, on average, higher than products with gluten in their composition. The results were consistent with data from Italian market.

#### Conclusion

The current study suggests that there are no meaningful effects of non-gluten-free food in general population.

Multimorbidity and polypharmacy in Elderly

## Multimorbidity and polypharmacy in Elderly

PO - (AM2021-27630)

### DEVELOPMENT OF COMMUNITY NURSE - INFORMAL CAREGIVER RELATIONSHIPS

Alina Vaskelyte<sup>1</sup>; Aurelija Blazeviciene<sup>1</sup>; Ausra Kunciene<sup>1</sup>

**Keywords:** Community nurses, Informal Caregivers, Home care, Qualitative study

1 - Lithuanian University of Health Sciences

#### **Background**

Patients with chronic health care conditions who require long-term care are nursed at home, therefore, there is a shift in responsibility for their care from paid formal caregivers to unpaid family members.

#### **Aim**

To assess development of community nurse - informal caregiver relationships.

#### **Methods**

Thirty-one nurses, providing home care services to patients with special needs requiring constant care, participated in five semi-structured focus-group discussions. The data analysis was based on the descriptive phenomenology

#### **Results**

Three distinct phases in the development of informal caregiver–nurse relationship were uncovered: (1) the first phase is associated with the organisation of home care in the family context, including creation of new roles for family members, establishing collaboration with nurses and close interdependence with a person in care; (2) the management of possibilities and challenges faced by informal caregivers in home care phase, during which informal caregivers get involved and prepared for home care in order to ensure the continuity of twenty-four hour care services, the need for formal and informal assistance and respite services is evaluated; (3) the impact of home care on informal caregivers' quality of life and health phase is associated with social and economic burden of care, physical and emotional health problems, spiritual and ethical issues of home care.

#### **Conclusion**

Community nurses define their role in home care as assistants to informal caregivers. Since home care takes up most of informal caregivers' time, it is essential for community nurses to inform about organisations providing medical, psychological, social assistance.

## Multimorbidity and polypharmacy in Elderly

PO - (AM2021-27738)

### “DEPRESCRIBE”: REDUCTION OF POLYPHARMACY AND IMPROVEMENT OF QUALITY OF LIFE

Jorge Balteiro<sup>1</sup>; Cátia Sofia Cátia Silva<sup>1</sup>

**Keywords:** deprescribe, polymedication, inadequate prescription

1 - Coimbra Health School

#### **Background**

Deprescription consists on suspending the use of potentially inappropriate drugs, assessing the risks and benefits for a patient. Polypharmacy in the elderly or chronically patients is associated with an increased risk of adverse drug reactions. Drugs responsible for side effects and those that do not have a relevant clinical indication in their use may be suspended. The decision to maintain, reduce or discontinue a drug should be based on a balance between its effectiveness and the possible risks of its use.

#### **Aim**

Analyze the relationship between deprescription in patients, usually polymedicated, and the improvement of their quality of life.

#### **Material and methods**

Information was collected through the "PubMed", "Scielo" and "B-on" databases for articles published in the last ten years, using the key words "deprescribe"; "polymedication"; "inappropriate prescription".

#### **Results**

The analysis of 8 studies concluded that the benefit of many medicines may be absent and that the risk of adverse drug reactions is high. The relevance of a drug changes over time and it may, eventually, become a potentially inappropriate medication. It has been found that in older patients, the use of certain drugs becomes less beneficial and their use may exceed life expectancy.

#### **Conclusion**

Deprescription should be considered in any polymedication situation, especially in patients with limited or reduced life expectancy. There is a need to re-evaluate the therapy on an individual basis.

Innovative pharmacological approaches for noncommunicable diseases

## Innovative pharmacological approaches for noncommunicable diseases

PO - (AM2021-27725)

### A&NBSP; BIOTECHNOLOGICAL “GREEN” PROCESSING OF SENESCENT VACCINIUM LEAVES BIOMASS – *IN VIVO* SAFETY PROFILE

**Inês Pregoica**<sup>1,2,3</sup>; Carolina Ferreira<sup>1,2,3</sup>; Sara Nunes<sup>1,2,3,4</sup>; André Alves<sup>1,2,3</sup>; Pedro Vieira<sup>1,2,3,5</sup>; Mónica Zuzarte<sup>2,3</sup>; Artur Figueirinha<sup>4</sup>; Lúgia Salgueiro<sup>4</sup>; Flávio Reis<sup>1,2,3</sup>; Sofia Viana<sup>1</sup>

**Keywords:** Blueberry leaves, Enzymatic processing, Antioxidant capacity, Safety profile, Antidyslipidemic effect

1 - Institute of Pharmacology & Experimental Therapeutics & Coimbra Institute for Clinical and Biomedical Research (iCBR), Faculty of Medicine, University of Coimbra, Coimbra, Portugal; 2 - CIBB – Center for Innovative Biomedicine and Biotechnology, University of Coimbra, Coimbra, Portugal; 3 - Clinical Academic Center of Coimbra (CACC); 4 - Faculty of Pharmacy, University of Coimbra, Portugal; 5 - Polytechnic Institute of Coimbra, ESTESC-Coimbra Health School, Pharmacy, Portugal

#### Background

Blueberries (BB) supplementation elicits protection in an array of health conditions. Agro-wasted senescent leaves have been described as a superior source of polyphenols (PP) (1,2). Our group has recently developed a new sustainable, enzyme-assisted approach for BB leaves processing. Herein, we aim to characterize the resultant biomass in terms of PP composition and *in vivo* toxicity profile.

#### Methods

PP content was quantified by HPLC/PDA/ESI-MSn. Vegetable cell wall integrity was assessed with Scanning Electron Microscope (SEM). Total phenolic content (TPC) and total antioxidant capacity (TAC) were determined through the Folin-Ciocalteu/ABTS assays. 32 male C57BL/6J mice were allocated in 4 groups (n=8/group): control (vehicle) and 3 increasing doses of BB [BB1, 50 mg/Kg of body weight (BW); BB2, 500 mg/Kg BW; BB3, 1 g/Kg BW] during 28 days. Physical and biochemical parameters were assessed. Values are means ± S.E.M (ANOVA/post-hoc tests). This work was approved by the ORBEA of iCBR-FMUC (12/2018).

#### Results

HPLC/PDA/ESI-MSn analysis revealed chlorogenic acid as the main PP. TPC and TAC were quantified as 505,30 GAE mg/g BB and 51,14 AAE mg/g BB (220-fold and 38-fold increase in comparison to the fruit, respectively). Relative organ weights showed no significant differences. Serum markers of hepatic function were found within the normal range albeit BB3-animals displayed altered renal function (urea and uric acid, p<0.05). Notably, BB was able to elicit a decrease in serum triglycerides in the BB2/BB3 dosages (p<0.05).

#### Conclusion

Our findings point to a new class of BB-derived nutraceuticals as promising alternatives to tackle metabolic impairments.

## Innovative pharmacological approaches for noncommunicable diseases

PO - (AM2021-27741)

### PHARMACOGENOMIC APPLICATION IN HER2-POSITIVE BREAST CANCER

Célia A. Gomes<sup>1</sup>; Ana Guedes<sup>2</sup>

**Keywords:** Pharmacogenomics, Breast Cancer, HER2 Receptor

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Ciências Complementares Portugal; 2 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Farmácia, Portugal

#### Background

Pharmacogenomics elucidates the hereditary basis of inter-individual differences in drug responses. Genetic variation influences individuals' response to pharmacological treatment. Therefore, pharmacogenomic information can be used to make treatment more effective and safer, allowing a personalized treatment, especially in Oncology. Pharmacogenomics and precision medicine strategies are becoming increasingly prevalent in research and clinical practice.

Breast cancer is a heterogeneous disease that can be classified in 5 different subtypes, based on molecular stratification, among which is found human epidermal growth factor receptor-2 (HER2). It represents a global health problem due to lack of effective therapeutic regimens applicable to all groups. About 25% of all breast cancers are HER2-positive. Several studies have established the HER2 receptor as an effective target for the treatment.

#### Methods

A literature review was carried out in the PubMed, Science Direct and Scielo databases, using the keywords "Pharmacogenomics"; "Breast Cancer"; "HER2 Receptor". After exclusion criteria, 18 articles were selected for analysis.

#### Results

In the last 2 decades, there has been great progress in the development of drugs for the treatment of HER2-positive breast cancer. The discovery of the monoclonal antibody trastuzumab led to a substantial change in the natural history of the disease. There are currently several approved drugs targeting the HER2 receptor, which allow for a decrease in morbidity and mortality. Anti-HER2 therapies show very good survival results for patients with HER2-positive breast cancer.

#### Conclusion

This review presents the drugs approved for the treatment of HER2-positive breast cancer and elucidates how pharmacogenomics can be used to adjust therapy to the patient.

## Innovative pharmacological approaches for noncommunicable diseases

PO - (AM2021-27777)

### COENZYME Q10 IN PREVENTIVE MEDICINE: REVIEW

Teresa Alves<sup>1</sup>; Rui Cruz<sup>1</sup>

**Keywords:** Coenzyme Q10, Mechanisms of Coenzyme Q10, Coenzyme Q10 disease's

1 - Polytechnic Institute of Coimbra, ESTESC-Coimbra Health School, Pharmacy, Portugal

#### Background

Coenzyme Q10 is an essential co-factor and key component of the electron transport chain that leads to a decrease in the generation of free radicals acting as a powerful antioxidant. Coenzyme Q10 levels have been shown to be altered in individuals with diseases such as Parkinson's disease, Huntington's disease, rheumatoid arthritis, heart failure, patients with breast cancer, sepsis, pregnancy at risk of pre-eclampsia, and syndrome uncontrolled blood pressure. Several studies have been developed to clarify and clarify the mechanism of action by which it intervenes in the various cellular processes as well as its power to improve symptoms and diseases. This study is intended to characterize the therapeutic interest of Coenzyme Q10 taking into account the results of its action and in several pathologies where they were used.

#### Methods

We conducted a review in the online databases: "PubMed", "ClinicalTrials.gov" and "Google Scholar", using keywords: "Coenzyme Q10", "CoQ10", "Mechanisms of Coenzyme Q10" and "Coenzyme Q10 diseases". The studies published between 2008 and 2019 with inclusion criteria.

#### Results

The therapeutic potential of Coenzyme Q10 still elicited many times since they were not fully revealed in their role in various diseases. Among the works, the next review of the course, Q-SYMBIO was the most comprehensive study and with more concrete scientific data. In most of the studies analyzed, it has not been proven beneficial.

#### Conclusion

We conclude that are great interest in the therapeutic potential of Coenzyme Q10, although it is necessary to clarify its intervention in diseases where there is a high oxidative stress.

Hearing and balance disorders and rehabilitation

## Hearing and balance disorders and rehabilitation

PO - (AM2021-27744)

### HYPOTHYROIDISM AND HEARING

Antónia Rodrigues<sup>1</sup>; Carla Matos Silva<sup>2</sup>

**Keywords:** Thyroid Gland, Acquired Hypothyroidism, Congenital Hypothyroidism, Hearing Loss

1 - MiniSom, uma marca amplifon; 2 - Instituto Politécnico de Coimbra, ESTeSC-Coimbra Health School, Departamento de Audiologia

#### Background

Thyroid hormones are highly essential from birth, facilitating the later stages of auditory development. Deficiency of this hormone in humans can lead to profound and congenital hearing loss, which can be prevented by the treatment of early hormone replacement in infants with hypothyroidism. One of the most important dysfunctions of the thyroid gland is hypothyroidism (congenital or acquired) in which the production or function of thyroid hormones is compromised. Hypothyroidism results in changes that may be significant to cause hearing loss. The objective of this work was to analyze, based on a systematic review of the literature, whether thyroid gland problems such as congenital hypothyroidism and acquired hypothyroidism affect hearing. It is also intended to compare the two types of hypothyroidism (congenital and acquired) perceiving the influence of these pathologies in the auditory system.

#### Methods

A literature search was conducted in B –on, Google Scholar, Medline, PubMed and SciELO. Regarding this study, were considered complete original scientific articles written in Portuguese and English, published in the last 10 years (2007/2017) and at least one of the terms of the keywords mentioned in the title and / or summary.

#### Results

Of a total of 28 articles after application of the inclusion criterion, 6 articles were selected, 2 on acquired hypothyroidism and 4 on congenital hypothyroidism.

#### Conclusion

It was observed that the results of the exams for hearing assessment demonstrate that the acquired hypothyroid patients had the highest auditory thresholds.

## Hearing and balance disorders and rehabilitation

PO - (AM2021-27752)

### AUDITORY TRAINING IN THE ELDERLY

Daniela Jesus<sup>1</sup>; Cristina Nazaré<sup>1</sup>

**Keywords:** auditory training, elderly, hearing loss, hearing aids, speech perception

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Audiologia, Portugal

#### Background

One of the main complaints that the elderly person has is listening, but not understanding speech. This can be related to the combination of the effects of aging processes with hearing loss, which decrease performance in processing the sound stimulus, but auditory training in the elderly can promote the plasticity of the central nervous system and improve the processing of auditory information. The objective of this study was to verify if the auditory training in elderly people with normal hearing or hearing loss (users or not users of hearing aids) favours their speech perception and other auditory abilities.

#### Methods

The work consisted of a systematic review of scientific articles (according to the objective) published from 2010 to 2020, obtained in the databases Pubmed, B-On, SciELO and Google Scholar, with the keywords: auditory training, elderly, hearing loss, hearing aids (in English and Portuguese).

#### Results

Five scientific articles were selected and demonstrated significant differences in auditory processing tests before and after auditory training in different groups and between moments of evaluation after auditory training, where the groups that received auditory training have a higher performance in the auditory processing, as in speech perception in noise.

#### Conclusion

Auditory training should be considered in the elderly with normal hearing or hearing loss (users or not users of hearing aids) due to the evidence from studies that it improves auditory processing in several abilities, such as speech perception which leads to improvements in communication.

## Hearing and balance disorders and rehabilitation

PO - (AM2021-27759)

### AUDITORY HYPERSENSITIVITY IN CHILDREN WITH AUTISM SPECTRUM DISORDERS

Mónica Santos<sup>1</sup>; [Cristina Nazaré<sup>1</sup>](#)

**Keywords:** Auditory hypersensitivity, autism spectrum disorders, autism, children, hyperacusis

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Audiologia, Portugal

#### **Background**

Auditory hypersensitivity in children with autism spectrum disorders (ASD) has been mentioned in the literature since the earliest reports of this disorder. Most of these children, when exposed to sound are terrified and agitated and may experience unpleasant physiological sensations, which is why it is important to evaluate hearing abilities in the diagnosis and treatment of children with ASD. The aim of this study is to verify if auditory hypersensitivity differs between children with and without autism spectrum disorders.

#### **Methods**

To meet the objective a systematic review of the literature was carried out through the analysis of original scientific articles published since 2011 and researched on the electronic databases B-on, PubMed, ScienceDirect, SciELO and ELSEVIER, using the keywords: auditory hypersensitivity, children with autism spectrum disorders, hyperacusis in autism, auditory hypersensitivity in children with autism, autism, in Portuguese and English.

#### **Results**

Of the 56 studies found during the research, four studies that addressed auditory hypersensitivity in children with ASD were considered relevant according to the pre-established criteria and objective and were included in this systematic review.

#### **Conclusion**

It can be concluded that children with ASD presented significantly more hearing problems than children who did not have, namely auditory hyposensitivity and auditory hypersensitivity where the percentage was significantly higher in comparison to children who did not have ASD. It was also found that the behavioural manifestations of sounds may not be associated with the hypersensitivity of the auditory pathway, but rather with the limbic system.

## Hearing and balance disorders and rehabilitation

PO - (AM2021-27802)

### BALANCE IN INDIVIDUALS WITH ALZHEIMER'S DISEASE

Ana Rita Alves<sup>1</sup>; Inês Araújo<sup>1</sup>; Cristina Nazaré<sup>1</sup>

**Keywords:** Alzheimer's disease, Balance, Vestibular function, Dementia

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Audiologia, Portugal

#### Background

Alzheimer's disease (AD) is the most common cause of dementia, which is the accumulation of two types of proteins in and around neurons, which makes communication impossible, leading to the gradual loss of cognitive functions. Balance, a function that allows the spatial orientation to be constantly and correctly maintained, is controlled by the cerebellum and the harmonious junction of peripheral information given by vision, proprioception and the vestibular system, when sent to the central nervous system. The proper functioning of all these actors in postural control is the basis for maintaining balance. This study aims to investigate whether there are alterations of balance in individuals with AD.

#### Methods

A research of scientific articles published since 2011 was carried out on the platforms PubMed, SciELO and B-on, through the keywords Alzheimer's disease, balance, vestibular function, dementia, to elaborate a systematic review according to the objective.

#### Results

Initially, 30 potential articles were found to be used in this study. After a more detailed reading, 15 articles were selected, of which 4 were included in this review, since only they fulfilled all the inclusion criteria initially established.

#### Conclusion

It was verified after the analysis of the articles that individuals with AD tend to present major alterations in balance, mainly associated to the progression of the disease, when compared with individuals without AD, of the same age group. It is thought that this fact may be associated with decreased blood flow in individuals with AD, as it compromises visual suppression, which influences the balance of these individuals.

Musculoskeletal injury

## Musculoskeletal injury

PO - (AM2021-27633)

### IMPORTANCE OF UPPER TRAPEZIUS DURING REACH AND RETRIEVAL MOVEMENT IN HEALTHY ELDERLY: EXPLORATORY STUDY

Vitor Ferreira Vitor Ferreira<sup>1</sup>

**Keywords:** Aging, EMG, Motion analysis, Motor control, Muscle function

1 - School of Health School, University of Aveiro

#### **Background**

The ability to reach and grasp it is required for over 50% of the activity of daily living tasks. Assessing and treatment upper limb can be challenging because of the complexities arising from multiple degrees of freedom. A good knowledge of the normal movement is essential to improve interventions aimed to recovery the motor control mechanisms. This study investigates the intensity pattern of muscle activity in the upper limb during reach and retrieval movement in healthy elderly people.

#### **Methods**

A cross-sectional observational study was done. Surface EMG was recorded from 7 muscles: triceps, biceps, anterior deltoid, posterior deltoid, upper trapezius, wrist extensors and wrist flexors during reach and retrieval movement. A standard procedure described in the SENIAM guidelines was used for skin preparation and electrode placement except the wrist extensors and wrist flexors for which electrodes were positioned to detect the greatest amplitude during maximum voluntary isometric contraction.

#### **Results**

18 healthy elderly individuals (10 men;  $61.2 \pm 7.6$  years;  $163.7 \pm 0.1$  cm;  $75.1 \pm 15.8$  kg;  $28.2 \pm 4.1$  kg/m<sup>2</sup>) was participated. Results show a very characteristic activation pattern for upper trapezius, with three peaks muscle intensity. One before grasp the object, and two peaks after grasp the object. Anterior deltoid muscle was in average the most active muscle during the task.

#### **Conclusion**

Upper trapezius in this task proved to be an imperative muscle in recruitment pattern for the enhancement of the movement. The assessment of postural muscles is crucial for a good treatment program in functional tasks like reaching.

## Musculoskeletal injury

PO - (AM2021-27681)

### BIPEDAL WEIGHT-BEARING STANCE POSTURAL KINEMATIC ANALYSIS IN FLATFOOT SUBJECTS.

Joel Marouvo<sup>1,2</sup>; Maria António Castro<sup>3,4</sup>; Orlando Fernandes<sup>5</sup>; Filipa Sousa<sup>6,7</sup>; Nelson Azevedo<sup>2,8</sup>

**Keywords:** Foot Posture, Linear analysis, Pés planus, Plantar pressure

1 - RoboCorp Laboratory, i2A, Polytechnic Institute of Coimbra, Coimbra, Portugal; 2 - Faculty of Sports, University of Porto, Porto, Portugal; 3 - Department of Physiotherapy Polytechnic Institute of Leiria, Leiria, Portugal; 4 - Centre for Mechanical Engineering, Materials and Processes (CEMMPRE), University of Coimbra, Coimbra, Portugal; 5 - Department of Sport and Health, University of Évora, Évora, Portugal; 6 - Porto Biomechanics Laboratory (LABIOMEUP), University of Porto, Porto, Portugal; 7 - Faculty of Sport (FADEUP), CIFI2D, University of Porto, Porto, Portugal; 8 - Department of Physiotherapy, Instituto superior de Saúde, ISAVE, Amares, Portugal

#### Background

Foot posture alignment has been associated with lower-limbs abnormal motion and altered postural stability. In flatfoot subject, the risk of developing mechanical overloading injuries is higher compared to control subjects. This alteration can induce knee pain, cartilage damage, *Medial Tibial Stress Syndrome*, or sacroiliac joint dysfunction. The study aim was to investigate the overall kinematics differences among foot posture condition.

#### Methods

An observational descriptive study was carried out at the *RoboCorp Laboratory – Physiotherapy*, at the Polytechnic Institute of Coimbra. The sample consisted in 31 participants ( $23.26 \pm 4.43$  years), where 15 participants joined the bilateral flatfoot group and the remaining 16 bilateral neutral-foot group. Subjects were screened, prior to kinematic posture analysis, using the *Navicular Drop Test* and *Resting Calcaneal Stance Position* test, to characterize each group. All participants realized a bipedal weight-bearing stance assessment, using *3D-Motion Capture* system and a force platform. Data were statistically processed with the *IBM SPSS Statistics 27.0* software (*IBM Corporation, New York, USA*). The differences between the groups were assessed according to the *T-test for independent samples* and *U-Mann Whitney* (ICC 95%).

#### Results

Considering the kinematics outcomes, the only statistically significant results found were concerning the ankle joint namely in the sagittal ( $d=1.93^\circ$ ,  $p=0.047$ ), coronal ( $d=2.62^\circ$ ,  $p=0.013$ ) and transverse ( $d=5.02^\circ$ ,  $p=0.001$ ) planes.

#### Conclusion

Flatfoot subjects presents few alterations compared to neutral-foot participants, in bipedal weight-bearing stance. Those results can be translated in a drop of the *Navicular* bone and the entire *Medial Longitudinal Arch* collapse, i.e., alterations that are present in flatfoot subjects.

## Musculoskeletal injury

PO - (AM2021-27683)

### POSTURAL STABILITY ANALYSIS IN FLATFOOT SUBJECTS.

Joel Marouvo<sup>1,2</sup>; Maria António Castro<sup>3,4</sup>; Orlando Fernandes<sup>5</sup>; Filipa Sousa<sup>6,7</sup>; Nelson Azevedo<sup>2,8</sup>

**Keywords:** Foot Posture, Pés planus, Plantar pressure, Center of Pressure

1 - RoboCorp Laboratory, i2A, Polytechnic Institute of Coimbra, Coimbra, Portugal; 2 - Faculty of Sports, University of Porto, Porto, Portugal; 3 - Department of Physiotherapy Polytechnic Institute of Leiria, Leiria, Portugal; 4 - Centre for Mechanical Engineering, Materials and Processes (CEMMPRE), University of Coimbra, Coimbra, Portugal; 5 - Department of Sport and Health, University of Évora, Évora, Portugal; 6 - Porto Biomechanics Laboratory (LABIOMEUP), University of Porto, Porto, Portugal; 7 - Faculty of Sport (FADEUP), CIFI2D, University of Porto, Porto, Portugal; 8 - Department of Physiotherapy, Instituto Superior de Saúde, ISAVE, Amares, Portugal

#### Background

Stability requires cognitive resources to process somatosensory input, any additional process can reduce stability maintenance, increasing fall risk. Flatfoot subjects presents plantar foot area increase compared to neutral-foot subjects which can impair the plantar pressure feedback, resulting in the other receptors system compensation for maintaining postural stability. The study purpose was to investigate the postural stability differences among foot posture condition.

#### Methods

An observational descriptive study was carried out at the *RoboCorp Laboratory – Physiotherapy*, at the Polytechnic Institute of Coimbra. The sample consisted in 31 participants ( $23.26 \pm 4.43$  years), where 15 participants joined the bilateral flatfoot group and the remaining 16 bilateral neutral-foot group. Subjects were screened, prior to kinematic posture analysis, using the *Navicular Drop Test* and *Resting Calcaneal Stance Position* test, to characterize each group. All participants realized a bipedal weight-bearing stance assessment, using *3D-Motion Capture* system and a force platform. Data were statistically processed with the *IBM SPSS Statistics 27.0* software (*IBM Corporation, New York, USA*). The differences between the groups were assessed according to the *T-test for independent samples* and *U-Mann Whitney* (ICC 95%).

#### Results

Regarding the CoP outcomes, no statistically significant results were found ( $p > 0.05$ ) between groups.

#### Conclusion

Considering the *Center of Pressure* characteristics, flatfoot subjects did not presented alterations compared to neutral-foot participants, in bipedal weight-bearing stance. Considering the lack of consensus among evidence further studies need to encompass methodological variables handling to focus only in foot alteration.

## Musculoskeletal injury

PO - (AM2021-27684)

### TIBIALIS POSTERIOR MUSCLE STIFFNESS ASSESSMENT REGARDING FOOT POSTURE, BY ULTRASOUND BASED SHEAR-WAVE ELASTOGRAPHY.

Joel Marouvo<sup>1,2</sup>; Filipa Sousa<sup>3,4</sup>; Alexandra André<sup>5</sup>; Maria António Castro<sup>6,7</sup>

**Keywords:** Foot, Diagnostic imaging, Ultrasonography, Flatfoot

1 - Faculty of Sports, University of Porto, Porto, Portugal; 2 - RoboCorp Laboratory, i2A, Polytechnic Institute of Coimbra, Coimbra, Portugal; 3 - Faculty of Sport (FADEUP), CIFI2D, University of Porto, Porto, Portugal; 4 - Porto Biomechanics Laboratory (LABIOMEP-UP), University of Porto, Porto, Portugal; 5 - Department of Medical Imaging and Radiotherapy, Coimbra Health School – Polytechnic Institute of Coimbra, Coimbra, Portugal; 6 - Department of Physiotherapy, Coimbra Health School – Polytechnic Institute of Coimbra, Coimbra, Portugal; 7 - Centre for Mechanical Engineering, Materials and Processes (CEMMPRE), University of Coimbra, Coimbra, Portugal

#### Background

Flatfoot subjects present greater foot complex mobility with a predisposition for developing adjacent overloading injuries. Foot and ankle joint biomechanics impairment can lead to muscle and tendon pathologies regarding *Tibialis posterior* muscle. Ultrasound assessment of muscle stiffness can be useful to injuries risk factors identification based Shear-Wave Elastography. The study purpose was to investigate the *Tibialis posterior* deep and superficial layers stiffness differences between flat- and neutral-foot subjects.

#### Methods

This observational descriptive study was realized at the *RoboCorp Laboratory – Physiotherapy*, at the Polytechnic Institute of Coimbra. Eighteen subjects were recruited for this study ( $22.7 \pm 4.5$  years). Nine subjects were included in the flatfoot group and the others in the neutral-foot group. Inclusion criteria in the flatfoot group encompassed subjects that presented a  $>9\text{mm}$  Navicular Drop Test score. All participants realized a *Tibialis posterior* stiffness assessment with the help of Ultrasound base Shear-Wave Elastography (*Acuson Sequoia Ultrasound System 2018, Siemens Healthcare GmbH, Erlangen, Germany*). Data were statistically processed with the *IBM SPSS Statistics 25.0* software (*IBM Corporation, New York, USA*) where group differences were assessed using the *U-Mann Whitney* test (95% ICC).

#### Results

Regarding both groups and layers, no statistically significant differences between groups were found ( $p=0.424/0.258$ ).

#### Conclusion

This study related the stiffness differences among foot posture. However, stiffness analysis in this study cannot be considered as an important indicator to analyze flatfoot nor neutral-foot subjects.

## Musculoskeletal injury

PO - (AM2021-27721)

### TIBIALIS POSTERIOR MUSCLE STIFFNESS ANALYSIS, BY ULTRASOUND BASED SHEAR-WAVE ELASTOGRAPHY.

Joel Marouvo<sup>1,2</sup>; Filipa Sousa<sup>3,4</sup>; Alexandra André André<sup>5</sup>; Maria António Castro<sup>6,7</sup>

**Keywords:** Diagnostic imaging, Ultrasonography, Tendon

1 - Faculty of Sports, University of Porto, Porto, Portugal; 2 - RoboCorp Laboratory, Polytechnic Institute of Coimbra, Coimbra, Portugal; 3 - Faculty of Sport (FADEUP), CIFID, University of Porto, Porto, Portugal; 4 - Porto Biomechanics Laboratory (LABIOMEP-UP), University of Porto, Porto, Portugal; 5 - Department of Medical Imaging and Radiotherapy, Coimbra Health School – Polytechnic Institute of Coimbra, Coimbra, Portugal; 6 - Department of Physiotherapy, Coimbra Health School – Polytechnic Institute of Coimbra, Coimbra, Portugal; 7 - Centre for Mechanical Engineering, Materials and Processes (CEMMPRE), University of Coimbra, Coimbra, Portugal

#### Background

The most affected muscle concerning flatfoot condition is the *Tibialis Posterior* that can further lead to developing *Medial Tibial Stress Syndrome* or muscle and tendon pathologies. It presents two layers that can be evaluated, the *deep* and *superficial* layer. Ultrasound based Shear-Wave Elastography was developed to assess in real-time, *in vivo* muscle stiffness to quantify elasticity and stiffness. Thereby, it can provide a localized estimation of muscle stiffness and can be useful to assess injuries risk factors. The aim of this study was to analyze the association between *Tibialis posterior deep* and *superficial* layers stiffness.

#### Methods

An observational descriptive study was carried out at the *RoboCorp Laboratory – Physiotherapy*, at the Polytechnic Institute of Coimbra. The sample was composed by 18 subjects ( $22.7 \pm 4.5$  years) after meeting several inclusion criteria. All participants realized a *Tibialis posterior* stiffness assessment with the help of Ultrasound base Shear-Wave Elastography (*Acuson Sequoia Ultrasound System 2018, Siemens Healthcare GmbH, Germany*). Data were statistically processed with the *IBM SPSS Statistics 25.0* software (*IBM Corporation, New York, USA*) where association between *Tibialis Posterior deep* and *superficial* layer were determined by *Pearson's* correlation analysis (95% ICC).

#### Results

Regarding the layers correlation, no statistically significant result was found ( $p=0.194$  /  $r=-0.225$ ).

#### Conclusion

This study related the stiffness correlation regarding the *deep* and *superficial* layer of the *Tibialis Posterior* muscle. Stiffness analysis correlation among intramuscular layers cannot be considered as an important indicator to analyze globally this muscular complex.

## Musculoskeletal injury

PO - (AM2021-27728)

### MUSCLE STIFFNESS DIFFERENCES REGARDING FOOT POSTURE BY ULTRASOUND-BASED SHEAR-WAVE ELASTOGRAPHY.

Joel Marouvo<sup>1,2</sup>; Maria António Castro<sup>1,3,4</sup>; Alexandra André<sup>5</sup>; Rui Mendes<sup>1,6,7</sup>; Filipa Sousa<sup>8,9</sup>

**Keywords :** Diagnostic imaging, Ultrasonography, Flatfoot, Gait pattern

1 - RoboCorp Laboratory, i2A, Polytechnic Institute of Coimbra, Coimbra, Portugal; 2 - Faculty of Sports, University of Porto, Porto, Portugal; 3 - Department of Physiotherapy, Coimbra Health School - Polytechnic Institute of Coimbra, Coimbra, Portugal; 4 - Centre for Mechanical Engineering, Materials and Processes (CEMMPRE), University of Coimbra, Coimbra, Portugal; 5 - Department of Medical Imaging and Radiotherapy, Coimbra Health School – Polytechnic Institute of Coimbra, Coimbra, Portugal; 6 - Department of Sport Sciences, Coimbra Education School – Polytechnic Institute of Coimbra, Coimbra, Portugal; 7 - Faculty of Sport, CIDAF, University of Coimbra, Coimbra, Portugal; 8 - Porto Biomechanics Laboratory (LABIOMEUP), University of Porto, Porto, Portugal; 9 - Faculty of Sport (FADEUP), CIFI2D, University of Porto, Porto, Portugal

#### Background

Foot posture, through altered lower limb motion pattern can induce injuries and have been associated with abnormal foot motion during gait. In late stance-early swing, *Rectus Femoris* muscle activity increase to control knee flexion. Muscle stiffness assessment can help in the injuries risk factors identification while coupling with Ultrasound based Shear-Wave Elastography for its management. This study aims to investigate the muscle stiffness differences between regarding foot posture.

#### Methods

The observational descriptive study was carried out at *RoboCorp Laboratory – Physiotherapy*, at the Coimbra Health School, at the Polytechnic Institute of Coimbra. The sample consisted of 18 participants ( $22.7 \pm 4.5$  years). Subjects were allocated in the flatfoot group if they presented a bilateral *Navicular Drop Test* score of  $>9\text{mm}$ . The remaining participants represented the neutral-foot group. All participants were submitted to bilateral *Rectus Femoris* stiffness assessment with the help of Ultrasound base Shear-Wave Elastography (*Acuson Sequoia Ultrasound System 2018, Siemens Healthcare GmbH, Erlangen, Germany*). Data were statistically processed with the *IBM SPSS Statistics 27.0* software (*IBM Corporation, New York, USA*). Group differences were assessed using the *T- test for independent samples (95% ICC)*.

#### Results

Regarding both groups, no statistically significant differences between groups were found ( $p=0.249 / d=0.83$ ).

#### Conclusion

This study related the stiffness differences among the *Rectus Femoris* muscle regarding foot posture. However, we did not find differences between groups, i.e., stiffness analysis cannot be considered as an important indicator to analyze *Rectus Femoris* stiffness among flatfoot subjects.

## Musculoskeletal injury

PO - (AM2021-27776)

### OROFACIAL AND TEMPOROMANDIBULAR REGION SYMPTOMATOLOGY IN MUSICIANS

Ana Duarte<sup>1</sup>; Sofia Lopes<sup>1,2,3</sup>; Paula Santos<sup>1,4</sup>; Cristina Mesquita<sup>1,2</sup>

**Keywords:** temporomandibular joint, temporomandibular disorder, instrumentalists musicians, frequency, risk factors

1 - Escola Superior de Saúde, Instituto Politécnico do Porto; 2 - CIR-Centro de Investigação e Reabilitação; 3 - Escola Superior de Saúde do Vale do Sousa; 4 - CIAFEL- Centro de Investigação em Atividade Física, Saúde e Lazer

#### Background

Temporomandibular disorders can be associated with lifestyle and occupation and they are notably becoming more frequent in instrumentalists musicians. The main objective of the study is to determine the frequency of orofacial and temporomandibular region symptomatology in musicians, as well as to determine the existence of differences between instrumentalists groups (wind, stringed and percussion). The secondary objective is to analyse the relation between potential risk factors, such as the number of years of instrumental practice experience, the average number of practice hours per week and the type of instrumental practice as a profession or a hobby in the different domains evaluated.

#### Methods

A cross-sectional study was conducted with 102 instrumentalists musicians who participated voluntarily. A link with two questionnaires was published on social media to characterize the sample concerning their instrumental practice and about orofacial symptomatology, temporomandibular region and psychosocial aspects.

#### Results

The frequency of orofacial pain was 17.6%, 29.5% reported headaches, 28.5% presented articular sounds and the limitation when opening and closing the mouth was 4.9%. The most common signs and symptoms were back pain (56.8%), tiredness and lack of energy (37.3%) and difficulty sleeping (35.3%). Percussion instrumentalists were most likely to grind their teeth, when compared to wind instrumentalists, and stringed instrumentalists were more depressed, feeling down or hopeless, when compared to percussion instrumentalists ( $p < 0.05$ ).

#### Conclusion

Low frequencies of orofacial and temporomandibular region symptomatology were observed. An evident existence of significative differences between instrumentalists groups was not observed, as well as the existence of relation between the potential risk factors.

## Musculoskeletal injury

PO - (AM2021-27789)

### MUSCLE STIFFNESS DIFFERENCES REGARDING FOOT POSTURE BY ULTRASOUND-BASED SHEAR-WAVE ELASTOGRAPHY

Joel Marouvo<sup>1,2</sup>; Maria António Castro<sup>2,3,4</sup>; Alexandra André<sup>5</sup>; Rui Mendes<sup>2,6,7</sup>; Filipa Sousa<sup>8,9</sup>

**Keywords:** Diagnostic imaging, Ultrasonography, Flatfoot, Gait pattern

1 - Faculty of Sports, University of Porto, Porto, Portugal; 2 - RoboCorp Laboratory, i2A, Polytechnic Institute of Coimbra, Coimbra, Portugal; 3 - Department of Physiotherapy, Coimbra Health School - Polytechnic Institute of Coimbra, Coimbra, Portugal; 4 - Center for Mechanical Engineering, Materials and Processes (CEMMPRE), University of Coimbra, Coimbra, Portugal; 5 - Department of Medical Imaging and Radiotherapy, Coimbra Health School – Polytechnic Institute of Coimbra, Coimbra, Portugal; 6 - Department of Sport Sciences, Coimbra Education School – Polytechnic Institute of Coimbra, Portugal; 7 - Faculty of Sport, CIDAF, University of Coimbra, Coimbra, Portugal; 8 - Porto Biomechanics Laboratory (LABIOMEP-UP), University of Porto, Porto, Portugal; 9 - Faculty of Sport (FADEUP), CIFI2D, University of Porto, Porto, Portugal

#### Background

Foot posture, through altered lower limb motion pattern can induce injuries and have been associated with abnormal foot motion during gait. In late stance-early swing, *Rectus Femoris* muscle activity increase to control knee flexion. Muscle stiffness assessment can help in the injuries risk factors identification while coupling with Ultrasound based Shear-Wave Elastography for its management. This study aims to investigate the muscle stiffness differences between regarding foot posture.

#### Methods

The observational descriptive study was carried out at *RoboCorp Laboratory – Physiotherapy*, at the Coimbra Health School, at the Polytechnic Institute of Coimbra. The sample consisted of 18 participants ( $22.7 \pm 4.5$  years). Subjects were allocated in the flatfoot group if they presented a bilateral *Navicular Drop Test* score of  $>9$ mm. The remaining participants represented the neutral-foot group. All participants were submitted to bilateral *Rectus Femoris* stiffness assessment with the help of Ultrasound base Shear-Wave Elastography (*Acuson Sequoia Ultrasound System 2018, Siemens Healthcare GmbH, Erlangen, Germany*). Data were statistically processed with the *IBM SPSS Statistics 27.0* software (*IBM Corporation, New York, USA*). Group differences were assessed using the *T- test for independent samples (95% ICC)*.

#### Results

Regarding both groups, no statistically significant differences between groups were found ( $p=0.249 / d=0.83$ ).

#### Conclusion

This study related the stiffness differences among the *Rectus Femoris* muscle regarding foot posture. However, we did not find differences between groups, i.e., stiffness analysis cannot be considered as an important indicator to analyze *Rectus Femoris* stiffness among flatfoot subjects.

## Musculoskeletal injury

PO - (AM2021-27847)

### POSTURAL STABILITY ASSESSMENT IN FLATFOOT SUBJECTS TROUGH APPROXIMATE ENTROPY ANALYSIS.

Joel Marouvo<sup>1,4</sup>; Maria António Castro<sup>1,2,3</sup>; Nelson Azevedo<sup>4,5</sup>; Filipa Sousa<sup>6,7</sup>; Orlando Fernandes<sup>8</sup>

**Keywords:** Foot Posture, Pés planus, Non-linear methods

1 - RoboCorp Laboratory, i2A, Polytechnic Institute of Coimbra, Coimbra, Portugal; 2 - Sector of Physiotherapy, School of Health Sciences, Polytechnic Institute of Leiria, Leiria, Portugal; 3 - Centre for Mechanical Engineering, Materials and Processes (CEMMPRE), University of Coimbra, Coimbra, Portugal; 4 - Faculty of Sports, University of Porto, Porto, Portugal; 5 - Instituto superior de Saúde, ISAVE, Amares, Portugal; 6 - Porto Biomechanics Laboratory (LABIOMEUP), University of Porto, Porto, Portugal; 7 - Faculty of Sport (FADEUP), CIFID2, University of Porto, Porto, Portugal; 8 - Department of Sport and Health, University of Évora, Évora, Portugal

#### Background

Stability requires cognitive resources to process somatosensory input, any additional process can reduce stability maintenance. The Approximate Entropy is a method that quantifies the postural stability by measuring irregularity, and randomness of the Center of Pressure during upright standing. A small value will indicate a higher probability of regularly repeating sequences, a zero value will correspond to a perfectly repeatable motion and finally, a value of 2 corresponds to a random time series. This study aims to investigate the postural stability differences in flat foot subjects through the Approximate Entropy analysis.

#### Methods

Thirty-one participants were recruited ( $23.26 \text{ yo} \pm 4.43 \text{ SD}$ ) comprising a total of 62 feet. 15 represented the experimental group with bilateral flatfoot condition and the remaining 16 the control group with the bilateral neutral foot condition. Subjects were screened, before posture analysis, using the Navicular Drop Test and Resting Calcaneal Stance Position test, to characterize each group. All participants were subjected to a bipedal weight-bearing stance posture stability analysis a force platform, both in eyes-open and closed condition. Therefore, the Approximate Entropy was calculated using the *Matlab-R2020b* (MathWorks Inc., USA) software.

#### Results

Among groups and condition, no statistically significant results were found ( $p > 0.05$ ) in the postural stability analysis.

#### Conclusion

No differences were found between groups or condition for the Approximate Entropy coefficient, which corresponds to an identical postural stability between groups. However, regarding methodological deficiency regarding influencing aspects, further studies need to encompass methodological variables handling to focus only on foot alteration.

Health promotion and disease prevention

## Health promotion and disease prevention

PO - (AM2021-27666)

### PROPERTIES OF ROYAL JELLY AND ITS APPLICATION IN CANCER

Tatiana Almeida<sup>1</sup>; Jorge Balteiro<sup>1</sup>

**Keywords:** Cancer, Royal Jelly, Properties of Royal Jelly

1 - EStESC – Coimbra Health School, Instituto Politécnico de Coimbra, Portugal

#### Background

Royal jelly (RJ) is the substance secreted by the hypopharyngeal and mandibular glands of worker bees and it is being an essential food for queen bees and larvae. Two constituents of RJ stand out: 10-hydroxy-trans-2-decenoic acid and antibacterial proteins. RJ affects the immune system, stimulating the production of antibodies and also immunomodulatory cells. The activities induced by RJ are useful to maintain homeostasis and recover from pathological conditions.

#### Methods

The study is a review article. The collection was done in databases such as Pubmed and Science Direct. The selection of articles was made by analyzing their abstracts. After full reading, 83 articles were selected. The main objective is to analyze the properties of RJ and its generated benefits in the adverse effects caused by the treatment of cancer, not to mention the delay in its progression.

#### Results

Through its anti-inflammatory, immunoprotective and antioxidant activities, it has been shown that RJ can promote the full recovery of injuries caused by the adverse effects of chemotherapy / radiotherapy on patients with cancer, as well as reducing the growth of tumours. The antioxidant and anti-inflammatory function will develop a protective effect and help in the recovery of the lesions, while the immunoprotective function already plays a crucial role in the growth of the tumour.

#### Conclusion

It was demonstrated that RJ can reduce the adverse effects in patients that are going through cancer treatments, with a small amount of scientific evidence on its use in cancer prevention, as well as in its resolution.

## Health promotion and disease prevention

PO - (AM2021-27670)

### ADVERSE REACTIONS ASSOCIATED WITH FORXIGA USE: NUTRITIONAL AND METABOLISM CHANGES, UROGENITAL TRACT INFECTIONS, KIDNEY INJURIES AND DIABETIC KETOACIDOSIS

Ana Luísa Cardoso<sup>1</sup>; Andreia Rodrigues<sup>1</sup>; Yara Reis<sup>1</sup>

**Keywords:** Dapagliflozin, Adverse Reactions, Diabetes Mellitus

1 - Escola Superior de Tecnologia da Saúde de Coimbra

#### Background

Forxiga is a selective sodium-glucose co-transporter type 2 inhibitor, used to control type 2 Diabetes Mellitus. Like all medicines, it presents risks associated with its use. This article aims to analyze and understand the adverse reactions associated with the use of Forxiga.

#### Methods

Systematic review of articles published on Pubmed in the last 5 years. Study of notifications from the European Database of suspected adverse drug reactions – Eudravigilance.

#### Results

According to the predominant age group, the adverse reactions that occur the most in the database are related to nutritional and metabolic alterations, urogenital tract infections, urinary problems and diabetic ketoacidosis.

Dapagliflozin has the ability to reduce glucose levels in the bloodstream regardless of insulin and its resistance, or the level of beta cell function, because it's effective at any stage of the Type 2 Diabetes Mellitus. This efficacy is dependent on renal function, therefore reduced in patients with chronic kidney disease, especially in patients with low renal glomerular filtration rate.

#### Conclusion

In the future, it's of high importance to understand which precipitants together with Forxiga cause these adverse reactions (ADRs), so that health authorities can assess the benefit-risk relationship in order to implement measures for the protection of public health.

## Health promotion and disease prevention

PO - (AM2021-27680)

### “OPEN CONVERSATIONS ABOUT STI” COMBATING RISK BEHAVIORS IN UNIVERSITIES

Paula Agapito<sup>1,2,3</sup>; Andreia Vieira<sup>4,5</sup>; Marta Lopes<sup>6,7,8</sup>; Filomena Teixeira<sup>9</sup>; Anabela Martins<sup>10</sup>

**Keywords:** Sexual Transmitted Infections, University Students, Educational Program

1 - TSDT- Centro Hospitalar e Universitário de Coimbra; 2 - Assistente Convidada na Escola Superior de Tecnologia da Saúde de Coimbra; 3 - Citotécnica Sénior - CEDAP; 4 - Nutricionista Estagiária (3255 NE); 5 - Aluna do Mestrado de Educação para a Saúde do Politécnico de Coimbra; 6 - TSDT- Ortóptica; 7 - Aluna de Mestrado Educação para a Saúde do Politécnico de Coimbra; 8 - Ortoptista na AIBILI-Associação para Investigação Biomédica em Luz e Imagem; 9 - Professora na Escola Superior de Educação de Coimbra; 10 - Professora na Escola Superior de Tecnologia da Saúde de Coimbra

#### Background

Sexually Transmitted Infections (STI) are transmitted predominantly by sexual contact. They are among the most common causes of disease worldwide, constituting a public health problem. It is during the young age that the highest incidence of STI occurs, reaching 25% of people under the age of 25. It is essential to identify the risky sexual behaviors of young adults, so that we can invest in an effective education for the prevention of the disease. The main objective of the study is to educate University Students for behaviors that prevent STI transmission in order to reduce the incidence of these infections in this population.

#### Methods

It will be applied at an University with students attending the first and second year. Firstly, a questionnaire on risk behaviors will be implemented in order to understand the effective needs, their knowledge of infections and their risk behaviors. The project called “Open Conversations about STI” lasts 18 weeks. It consists of 6 sessions about STI and their risk behaviors, always accompanied by a specialist. In the end the initial questionnaire will be repeated, and a follow-up evaluation will be carried months after.

#### Results

It is expected to enable the target population to identify and characterize at least 80% of risk behaviors associated with STI and to decrease the practice of risk behavior in participants by at least 60% by the end of the project.

#### Conclusion

This project allows to educate young adults on the topic of STI and reduce its incidence.

## Health promotion and disease prevention

PO - (AM2021-27706)

### NUTRITIONAL PROFILE OF COMMERCIAL FOODS FOR CHILDREN AGED 0 TO 36 MONTHS IN PORTO, PORTUGAL

CRB Araujo<sup>3</sup>; P Padrão<sup>1,2,3,8</sup>; P Moreira<sup>3,4,5</sup>; KDS Ribeiro<sup>6</sup>; BR Carneiro<sup>6</sup>; AF Oliveira<sup>6</sup>; IL Morais<sup>7</sup>

**Keywords:** Food composition, Food Labeling, Diseases

1 - Faculdade de Ciências da Nutrição e Alimentação, Universidade do Porto; 2 - EPIUnit - Instituto de Saúde Pública, Universidade do Porto,; 3 - Faculdade de Ciências da Nutrição e Alimentação, Universidade do Porto, Porto, Portugal.; 4 - EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Porto, Portugal; 5 - Centro de Investigação em Atividade Física, Saúde e Lazer, Universidade do Porto, Porto, Portugal; 6 - Universidade Federal do Rio Grande do Norte (UFRN), Natal, Brasil.; 7 - Nutrition, Physical Activity and Obesity Programme, Division of Noncommunicable Diseases and Life-Course, World Health Organization (WHO) Regional Office for Europe, Copenhagen, Denmark; 8 - EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Porto, Portugal. Centro de Investigação em Atividade Física, Saúde e Lazer, Universidade do Porto, Porto, Portugal.

#### Background

Early nutrition is an important factor that impacts the development of eating behavior, food preferences, growth and later health, particularly the risk diseases. To evaluate the nutritional profile of commercial foods for children aged 0-36 months available in retail stores from Porto, Portugal, according the Pan American Health Organization Nutrient Profile Model (PAHONP), 2016.

#### Methods

A cross-sectional study carried out in 23 retail stores in two neighborhoods with great contrast in per capita income, was conducted using a World Health Organization protocol. The nutrition information was collected from the labels of all foods that were commercially produced for children up to 36 months. The nutritional information (per 100 g) was identified in relation to total energy, total carbohydrates, free sugars, total fat, saturated fat, sodium, in addition to the use of sweeteners.

#### Results

A total of 66 soups and fruit/vegetable purees were included. The mean ( $\pm$ SD) nutritional composition per 100g was: 63 kcal ( $\pm$ 11.9), 89,4% ( $\pm$ 2.8) of Total Energy Value (TEV) from total carbohydrates, 13.6% ( $\pm$ 1.52) from free sugars, and 3.0% ( $\pm$ 0.2) from total fat. The mean content of sodium was 7.0 mg ( $\pm$ 5.5) per 100g (0,1 mg sodium/kcal). All the included foods were excessive in free sugars (98.5% were fruit/vegetable purees and 1.5% soups). The percentage of foods above PAHONP cut-offs were 0% for sodium and saturated fat, no foods had sweeteners on their ingredient lists.

#### Conclusion

We found a high availability of excessive free sugars in the composition of commercial food products for children aged 0 to 36 months in Porto, Portugal.

## Health promotion and disease prevention

PO - (AM2021-27715)

### HEART RATE VARIABILITY: HOLTER VERSUS ELECTROCARDIOGRAM

Joaquim Pereira<sup>1</sup>; Inês Pavão<sup>1</sup>; Telmo Pereira<sup>1</sup>

**Keywords:** Short-term ECG, Heart rate variability, Holter, Cardiovascular disease

1 - ESTESCoimbra

#### Background

Heart Rate Variability (HRV) is a simple, non-invasive and easy to perform method. It describes the oscillations between RR intervals and is based on the concept that these oscillations may reflect changes in the activity of the Autonomic Nervous System (ANS) on the sinus node and consequently on the Heart Rate (HR).

To study HRV through Holter and Electrocardiogram (ECG) of short duration, comparing HRV indices in the time domain and in the frequency domain.

#### Methods

HRV was analyzed by performing a long-term ECG by Holter, with a minimum duration of 22 hours, during the individual's daily routine and by performing a short-term ECG, with about 6 minutes, with the individual lying at rest.

#### Results

The HR correlation was positive and very strong, in contrast to the SDNN and triangular index variables that showed no correlations. In the frequency domain, all variables indicated statistically significant differences between Holter and ECG ( $p = 0.000$ ), despite the intensity of the correlations being different. The variable VLF showed a negative correlation and the variable LF did not present a correlation.

#### Conclusion

HRV varies according to the duration of the recording used for its analysis, long-term ECG by Holter or short-term ECG, so it is important to distinguish the duration of the record used for a good interpretation of the results. HRV was all the greater as the duration of registration. Both records were reproducible in the time domain.

## Health promotion and disease prevention

PO - (AM2021-27730)

### MODELING AND QUALITY EVALUATION OF HYDROGELS CONTAINING SALICYLIC ACID IN VITRO

Kristina Perminaitė Kristina Perminaitė<sup>1,2</sup>; Aurimas Galkontas<sup>1</sup>

**Keywords:** Acne vulgaris, salicylic acid, hydrogels

1 - Kaunas University of Applied Sciences; 2 - Lithuanian University of Health Sciences

#### Background

Acne vulgaris is one of the most common inflammatory skin diseases in the world. *Acne vulgaris* usually affects the area of the sebaceous glands, and excess use of oily skincare products can cause stronger inflammation, so it is important to use water based products for the treatment.

The aim of the study was to model gels containing salicylic acid for acne treatments and their biopharmaceutical evaluation. Objectives: prepare gel bases, prepare gels with salicylic acid and evaluate their quality, to evaluate the release profiles of salicylic acid.

#### Methods

Various salicylic acid gels were prepared using gelling technologies. The pH values were determined using potentiometric method. Quantity of salicylic acid was determined spectrophotometrically. The *in vitro* release test was performed using modified Franz type diffusion cells. Mean and standard deviations were calculated by using Microsoft Office Excel 2016 and SPSS 25.0 software.

#### Results

The pH values of salicylic acid gels ranged from  $3.02 \pm 0.19$  to  $4.6 \pm 0.24$ . The pH depends on the form of salicylic acid incorporated (suspension decreased pH, solution increased). Gels with 3 % chitosan-base were stable and resistant to temperature's effects, as the change in flow index and consistency coefficient with temperature increase was statistically insignificant. All gels released high amounts of salicylic acid.

#### Conclusion

The results of the study showed that the amount of gelling agent and the form of active substance administration affected the gels' quality, and altered the pH. The amount of salicylic acid released depended on the amount of gelling agent - more gelling agent lowers the amount released.

## Health promotion and disease prevention

PO - (AM2021-27742)

### ANTIHYPERTENSIVE DRUG INTERACTIONS WITH GRAPEFRUIT JUICE

Célia A. Gomes<sup>1</sup>; Mariana Carreira<sup>2</sup>

**Keywords:** Arterial hypertension, Interactions, Grapefruit juice, Felodipine

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Ciências Complementares, Portugal; 2 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Farmácia, Portugal

#### Background

Most drugs' interactions are caused by food-induced variations in the drug's bioavailability. Many of these interactions affect the cytochrome P450 (CYP3A4) system, as it is responsible for the first-pass metabolism of many substances (drugs or nutrients). Grapefruit juice is one of these substrates, thus acting as an inhibitor of CYP3A4 in drug metabolization. Hypertension is a very common disease, causing several relevant morbidities. Of the many antihypertensive drugs available on the market, felodipine is an example of the group of calcium channel blockers. We hope to review the literature on drug - nutrient/food interactions, particularly in felodipine / grapefruit juice interactions, explaining the metabolic processes involved.

#### Methods

A literature review was carried out in the PubMed, Science Direct, and Scielo databases, using the keywords "Arterial hypertension"; "Interactions"; "Grapefruit juice"; "Felodipine". After applying the exclusion criteria, 18 articles were selected for analysis.

#### Results

The question that arises is which interactions happen with the concomitant intake of grapefruit juice with some medications, namely antihypertensives such as felodipine, due to the inactivation of CYP3A4. A study identified the substances present in grapefruit juice that interfere with felodipine activity in CYP3A4. Furanocoumarins have been identified as the compounds responsible for this metabolic interaction between grapefruit and felodipine. Thus, the intake of grapefruit juice without furanocoumarins may be an alternative for patients without interaction in CYP3A4 activity.

#### Conclusion

We concluded that furanocoumarins, present in grapefruit juice, interact in the activity of CYP3A4, altering the bioavailability of felodipine.

## Health promotion and disease prevention

PO - (AM2021-27768)

### NEUROPROTECTOR EFFECTS OF CAFFEINE

Beatriz Antunes Rodrigues<sup>1</sup>; Zélia Barbosa Moreira<sup>1</sup>

**Keywords:** caffeine, neurodegenerative diseases, prevention, adenosine receptors

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra HealthSchool, Farmácia, Portugal

#### Background

The aging process is typically accompanied by a progressive and gradual cognitive decline that triggers a set of morphological changes at the brain that can affect memory, speed of information processing, among other abilities of being, thus making people more vulnerable to the development of neurodegenerative diseases.

As for treatment of neurodegenerative diseases, there is no specific therapy that can reverse the evolution process of this clinical situation, being based on its control, that is, on the symptom relief in order to delay its effects. Since there is no effective treatment, we can act in the area of prevention, in which there are active substances with neuroprotector properties capable of decreasing the risk of contracting this type of disease, one of which is caffeine.

Several epidemiological studies have proven that the caffeine intake has a negative correlation with incidence of certain neurodegenerative diseases.

#### Methods

Bibliographic review through a research in diverse databases (PubMed, Google Scholar, ScienceDirect, MedlinePlus and Wiley Online Library).

#### Results

Caffeine is a promising alternative for neurodegenerative diseases because it contains multiple connections at the brain level, allowing it to act in this type of pathologies through different mechanisms of action.

Despite the adverse effects, can function as a therapeutic and/or preventive element of pathologies such as Alzheimer's disease, Parkinson's disease, among others.

#### Conclusion

There are still few studies about neuroprotective properties of caffeine in some neurodegenerative diseases, including MS, ALS. Currently, there are several studies underway, which can make caffeine a remarkable therapeutic and/or preventive option for several diseases.

## Health promotion and disease prevention

PO - (AM2021-27769)

### TOBACCO EFFECT IN YOUNG PEOPLE'S VASCULAR SYSTEM BY VASCULAR ULTRASSOUND

Carvalho Marta<sup>1</sup>; Santos Hélder<sup>1</sup>; Pereira Telmo<sup>1</sup>; Conde Jorge<sup>1</sup>

**Keywords:** Vascular Ultrasound, Arterial Stiffness, Pulse Wave Velocity, Smoking

1 - Escola Superior de Tecnologia da Saúde de Coimbra

#### Background

Tobacco is described as an important cardiovascular risk factor and it's been associated to several comorbidities. The main objective of this study was to compare arterial properties between young smokers and non-smokers and to determine the acute effect of tobacco in the smokers' vascular system. Another objective is related to the valorization of the vascular ultrasound in clinical practice to calculate arterial stiffness.

#### Methods

Ten non-smokers (average age 19,50±0,97) and thirteen smokers (average age 21,38±2,26) were included in this study to measure carotid-femoral pulse wave velocity (cfPWV), beta-stiffness ( $\beta$ ), compliance (C), distensibility (D), pressure-strain elastic modulus (Ep), intima-media thickness (IMT), carotid and femoral systolic and diastolic arterial diameters by vascular ultrasound and systolic blood pressure (SBP), diastolic blood pressure (DBP), mean blood pressure (MBP), pulse pressure (PP) and heart rate (HR) by automatic oscilometric measurement. Smokers were evaluated before, five and fifteen minutes after smoking one cigarette.

#### Results

Comparing smokers and non-smokers, at baseline, we don't observe significant differences between two groups. The acute effect of tobacco show significant results for cfPWV ( $p=0,011$ ), HR ( $p=0,006$ ), PP ( $p=0,019$ ), AFC distensibility ( $p=0,037$ ) and AFC Ep ( $p=0,037$ ). However, when we specify in which time interval it was significant, we only verify significance for HR between baseline and 5 minutes ( $p=0.034$ ) and 5 minutes and 15 minutes ( $p=0.008$ ).

#### Conclusion

The study indicates a tendency for vascular changes in young adults either in the comparison between smokers and non-smokers, or in the acute effect of cigarettes.

## Health promotion and disease prevention

PO - (AM2021-27788)

### ACTION OF BIOACTIVE COMPOUNDS IN THE PREVENTION OF HYPERCHOLESTEROLEMIA

Maria Pereira<sup>1</sup>; Ana Valado<sup>2</sup>

**Keywords:** Hypercholesterolemia, Nutraceuticals, Public Health, Cardiovascular Diseases

1 - Polytechnic Institute of Coimbra, Coimbra Health School, Department of Biomedical Laboratory Sciences, Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854, Coimbra; 2 - 1Polytechnic Institute of Coimbra, Coimbra Health School, Department of Biomedical Laboratory Sciences, Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854, Coimbra 2Laboratory for Applied Health Research (LabinSaúde), Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854, Coimbra 3Marine and Environmental Sciences Centre (MARE), Faculty of Sciences and Technology, University of Coimbra, 3001-456, Coimbra, Portugal

#### Background

Hypercholesterolemia is a serious public health issue, significantly increasing the incidence of cardiovascular disease (CVD), the leading cause of morbidity and mortality worldwide, making prevention an essential focus. The high impact of sedentary lifestyle associated with the consumption of processed foods favors the development of CVD. Add the harmful effects of the action of statins related to various contraindications that have favored the search for alternatives to the problem.

The goal of discovering bioactive compounds known as nutraceuticals, possessing a regulating action on the components of the lipid profile (total cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides).

#### Methods

With a brief review, it was possible to assess that from the bioactive properties of several compounds, functional and tasty foods were easily prepared, directly contributing to the prevention of the onset of CVD.

#### Results

The introduction of 100% vegetable gelatins rich in carrageenans, vegetable sterols (phytosterols and phytostanols), Policosanol (sugar cane wax), Berberis vulgaris L. and red rice represent alternatives for the regulation of the lipid profile, reducing one of the main risk factors for CVD. Regarding gelatins, the ingestion of 100 mL/day, preferably after dinner, reduces total cholesterol levels.

#### Conclusion

The consumption of nutraceuticals in a simple way and integrated into daily habits may be an added value in reducing the levels of the parameters of the lipid profile and consequent prevention of CVD.

## Health promotion and disease prevention

PO - (AM2021-27828)

### TYPE 2 DIABETES: DIFFERENT PEOPLE WITH DIFFERENT EVOLUTION?

Margarida Martins<sup>1</sup>; Inês Rosendo<sup>2</sup>; Bárbara Oliveiros<sup>1</sup>

**Keywords:** Type 2 Diabetes Mellitus, Cardiovascular Disease, Renal Insufficiency, Diabetic Retinopathy, Insulin

1 - Faculdade de Medicina da Universidade de Coimbra; 2 - USF Coimbra Centro

#### Background

Diabetes Mellitus has a high prevalence in the population. The main objective of this study is to understand possible cause-effect relationships between macro and microvascular complications of the disease and the different variables of the patient, in order to try to predict the evolution.

#### Methods

This study is a retrospective cohort in which the researchers accessed the medical information in the software SClínico from a group of people with the diagnosis of Diabetes Mellitus type 2 in 2010 or previously, in one Primary Health Care Unit. For the statistical analysis SPSS software with Shapiro-Wilk test was used to monitor the normality and Friedman and Q Cochran tests to evaluate the different variables in three different time periods, with a level of significance of 5%.

#### Results

In this study were found significant changes in the levels of BMI (decreased), HbA1c (increased), LDL cholesterol (decreased) and total cholesterol (decreased), leading to the outcome of cardiovascular disease, renal disease, diabetic retinopathy and insulin treatment. The cardiovascular disease was related with the triglycerides levels, having 13% chance of developing a cardiovascular disease in 5 years and the need to start insulin treatment was associated with the levels of glucose, HbA1c and triglycerides, explaining 12%, 9% and 13% of the probability of needing insulin in 5 years, respectively.

#### Conclusion

This study determines that the HbA1c and triglycerides had an overall increase throughout the time frame and are likely associated with the increase of the cardiovascular disease and the need to insulin therapy.

## Health promotion and disease prevention

PO - (AM2021-27864)

### DETERMINANTS OF FOOD CONSUMPTION AND BARRIERS FOR HEALTHY EATING AMONG SCHOOL WORKERS

Ana Beatriz Rodrigues<sup>1</sup>; Cláudia Viegas<sup>2,3</sup>; João Lima<sup>1,4,5</sup>

**Keywords:** Healthy eating, School workers, Eating Determinants, Eating Barriers

1 - Portugal Instituto Politécnico de Coimbra, ESTeSC-Coimbra Health School, Scientific Unit of Nutrition and Dietetics; 2 - Lisbon School of Health Technology, Polytechnic Institute of Lisbon; 3 - Centro de Investigação, Desenvolvimento e Inovação em Turismo - CiTUR; 4 - GreenUPorto – Sustainable Agrifood Production Research Centre; 5 - ciTechCare - Center for Innovative Care and Health Technology

#### Background

Healthy eating plays an important role in preventing chronic diseases, however eating behaviour is determined by several factors, and there are also barriers that difficult adequate food consumption. The identification of the determinants of food consumption and barriers for healthy eating allows for the most effective strategies design to promote adequate food consumption.

#### Aim

To identify the food consumption determinants and barriers for healthy eating among school workers.

#### Methods

Data collection was carried out through an online survey designed for this purpose, including food consumption determinants and barriers for healthy eating, identified in literature, and sociodemographic characteristics. The study was ethical approval and statistical analysis was performed using the IBM SPSS Statistics software. A significance level of 5% was considered.

#### Results

The study population consisted of 95 school workers, whose average age was 44.9±9.6 years, mostly women (67.4%) and married (63.2%). All respondents completed academically secondary or higher education, and the majority was graduated (51.6%). About 47% were teachers. The main determinants of food consumption were "Try to eat healthy" and "The taste of food". The "Work commitments / lack of time" and the "Established eating habits" were the most reported barriers to the practice of a healthy diet. Differences were observed between gender, education level and main activity, but not between age groups.

#### Conclusion

Mainly personal-centred determinants and barriers were observed. Strategies designed to promote healthy eating among school workers should be focused on individual strategies such as time management, knowledge and food habits change programs.

## Health promotion and disease prevention

PO - (AM2021-27866)

### DETERMINANTS OF CONSUMPTION OF LEGUMES AMONG HIGHER EDUCATION STUDENTS

Andreia Nascimento<sup>1</sup>; João Paulo de Figueiredo<sup>2</sup>; João Lima<sup>1,3,4</sup>

**Keywords:** Legumes, food consumption, Knowledge, Students, Eating Determinants

1 - Portugal Instituto Politécnico de Coimbra, ESTeSC-Coimbra Health School, Scientific Unit of Nutrition and Dietetics; 2 - Portugal Instituto Politécnico de Coimbra, ESTeSC-Coimbra Health School, Unidade Científico-Pedagógica de Ciências Médicas, Sociais e Humanas; 3 - GreenUPorto – Sustainable Agrifood Production Research Centre; 4 - ciTechCare - Center for Innovative Care and Health Technology

#### Background

In spite of it is associated to health benefits, and it is also an important food for the of environmental sustainability, legumes consumption is lower than recommendations, particularly in youth population. The identification of the determinants of consumption allows the most effective design of strategies to promote it.

#### Aim

To identify the determinants of legumes consumption among higher education students.

#### Methods

Data collection was carried out through an online survey designed for this purpose, including food consumption determinants, identified in literature, and sociodemographic characteristics. The study was ethical approval and statistical analysis was performed using the IBM SPSS Statistics software. A critical significance level of 5% was considered.

#### Results

There were evaluated 186 higher education students, aged between 18 and 23 years old. The determinants of food consumption that, according to the respondents, most influence the consumption of legumes are the quality of meals, price and accessibility. It was found that although the determinants of consumption influence both genders equally, male individuals seem to be more influenced by “Menu Variety” (p=0.002) and “Conviviality” (p=0.004).

#### Conclusions

Determinants related to availability and offer seems to be the most important ones in the population under analysis. Strategies designed to promote legumes consumption among higher education students should be focused on availability.

## Health promotion and disease prevention

PO - (AM2021-27783)

### MALE AND FEMALE OSTEOPOROSIS: COMPARATIVE ANALYSIS AND FUTURE THERAPIES

Luís Miguel Ferreira<sup>1</sup>; Zélia Barbosa Moreira<sup>1</sup>

**Keywords:** Bone Mineral Density, Osteoporosis, Bone Fractures, Therapy

1 - Instituto Politécnico de Coimbra, ESTESC-Coimbra Health School, Farmácia, Portugal

#### **Background**

Osteoporosis is a disease with a high prevalence in women; however, in men osteoporosis has higher levels of mortality. Pharmacological therapy has the main objective of reducing the occurrence of fractures and currently for that goal includes anti-resorptive agents and anabolic agents. Not all drugs used in women are used in men and studies of these drugs in the male population are sparse in both population and results, and the reduction of fractures in most of them is not evaluated. The use of BMD as a reference indicator in studies made on men may be an indicator that the current therapy in men is not as effective as it could potentially be. Due to the limits of current therapies, the need to find drugs capable of overcoming these limits is essential.

#### **Methods**

Bibliographic review through a research in diverse databases (PubMed, Google Scholar, ScienceDirect and Scielo).

#### **Results**

Osteoporosis therapy is divided into two main groups: anti-resorptive agents and anabolic agents. The approved therapies for male osteoporosis include bisphosphonates, denosumab and teriparatide. The clinical effects of these drugs are mostly studied in women, studies with large population relevance are rarely performed in men. There are promising drugs in development: sclerostin inhibitors, catsepine K and drugs based on gut hormones and sirtuins, are the latest substances under study.

#### **Conclusion**

The development of new drugs may represent a promising future in osteoporosis therapy, namely romosozumab which is at a more advanced stage of studies. There is a need for further studies that include more men.

Sleep and health

## Sleep and health

PO - (AM2021-27642)

### IMPACT OF DIETARY HABITS ON SLEEP QUALITY - REVIEW

**Bruno Abreu**<sup>1</sup>

**Keywords:** Dietary habits, Sleep quality, Nutrition

1 - Instituto Politécnico de Coimbra, ESTeSC – Coimbra Health School, Portugal

#### **Background**

The environment has transformed vastly over the past decades, which also has had an impact on sleep and dietary patterns and possibly health outcomes. The influence of the timing of eating on health outcomes is named chrono-nutrition. Sleep duration and quality have been linked with obesity, diabetes, hypertension, and cardiovascular disease risk. Objectives: To understand the impact of dietary habits on sleep quality.

#### **Methods**

Scientific articles were analysed from 2016 to 2020, based on *Pubmed* and *Google Scholar*. Keywords such as sleep quality, dietary habits and nutrition were used.

#### **Results**

From scientific research, six systematic reviews were analysed. Thus, it is estimated the analysis of 86,961 individuals from eight different countries. Most of the participants recruited were from generally healthy populations. The good sleepers - sleep duration  $\geq 7$  h; GSS (global sleep score)  $\leq 5$ ; SL (sleep latency)  $\leq 30$  min; SE% (sleep efficiency)  $\geq 85\%$  -, in overall, followed dietary patterns with a higher energy distribution from protein and relatively lower energy distribution from both carbohydrate and fat when related to the poor sleepers - sleep duration  $< 7$  h; GSS  $> 5$ ; SL  $> 30$  min; SE%  $< 85\%$ ).

#### **Conclusion**

Some dietary patterns and foods show potential as sleep modulators, but more randomized controlled trials are necessary to draw definitive conclusions. It is comforting to note that the verdicts reported are in line with other dietary recommendations for health in the general population: increasing fruit and vegetable intakes, choosing whole grains (higher in fiber), and preferring vegetable oils (low in saturated fat).

Diagnosis and monitoring of noncommunicable diseases

## Diagnosis and monitoring of noncommunicable diseases

PO - (AM2021-27655)

### ROLE OF MATRIX METALLOPROTEINASES IN VASCULAR PATHOLOGY

Gonçalo Simões<sup>1</sup>; Armando Caseiro<sup>1,2,3</sup>

**Keywords:** matrix metalloproteinases, vascular diseases, vascular remodeling

1 - Politécnico de Coimbra, ESTeSC, Ciências Biomédicas Laboratoriais, Rua 5 de Outubro, 3046-854 Coimbra, Portugal; 2 - LABINSAÚDE - Laboratório de Investigação em Ciências Aplicadas à Saúde, Instituto Politécnico de Coimbra, ESTeSC, Rua 5 de Outubro, 3046-854 Coimbra, Portugal; 3 - Unidade I&D Química-Física Molecular, Faculdade de Ciências e Tecnologia, Universidade de Coimbra, Coimbra, Portugal

#### Background

Vascular diseases are the main cause of morbidity and mortality. The vascular extracellular matrix (ECM) is essential in mechanical support, also regulating the cellular behavior fundamental to vascular function and homeostasis. Vascular remodeling is an adaptive response to various physiological and pathological changes and is associated with aging and vascular diseases. The change in the composition of the ECM by matrix metalloproteinases (MMPs) generates a pro-inflammatory microenvironment that modifies the phenotypes of endothelial cells and vascular smooth muscle cells.

#### Methods

The core of this work is derived from MEDLINE database literature search using the following terms: “matrix metalloproteinases”, “vascular diseases”, “vascular remodeling”, “hypertension”, “atherosclerosis”, “aortic aneurysm” and “myocardial infarction”.

#### Results

MMPs are associated with arterial hypertension through increasing blood pressure, that also leads to vascular wall weakening, causing aneurisms. They also play a key role during atherosclerosis and are related to the severity of myocardial infarction, being suggested as markers of the progression of heart failure.

#### Conclusion

MMPs can be considered important biomarkers of cardiovascular diseases. Current studies are focused on improving diagnosis and prognosis value of MMPs in the pathogenic process, increasing their therapeutical potential and monitoring the disease.

## Diagnosis and monitoring of noncommunicable diseases

PO - (AM2021-27695)

### FINE NEEDLE ASPIRATION IN FOLLICULAR TUMORS WITH ONCOCYTIC PHENOTYPE

Cristina Paula Agapito<sup>1,2,3</sup>; Vitor Sousa<sup>4,5,6</sup>

**Keywords:** Fine Needle Aspiration, Thyroid, Bethesda

1 - TSDT no Serviço de Anatomia Patológica do Centro Hospitalar e universitário de Coimbra; 2 - Citotécnica Sénior no Centro de Diagnóstico Anátomo Patológico-CEDAP; 3 - Assistente Convivada no Departamento de Ciências Biomédicas Laboratoriais das ESTESC; 4 - Professor no Instituto de Anatomia Patológica e Patologia Molecular na FMC; 5 - Patologista no Serviço de Anatomia Patológica do Centro Hospitalar e Universitário de Coimbra; 6 - Patologista no Centro de Diagnóstico Anátomo Patológico - CEDAP

#### Background

FNA is a first-line procedure for determining whether a pathology is benign or malignant.

Thyroid's FNA classification is established by the Bethesda System, which divides into six categories. Follicular Tumours with or without presence of Oncocytic Cells are included in the fourth category. However, is not possible to distinguish between benignity and malignancy, since only with a histological examination can we verify whether the tumor capsule is complete or not and if there is presence of vascular invasion.

The oncocytical cell differs from the follicular one because it is larger, having a hyperchromatic nucleus of broad cytoplasm and for containing a higher number of mitochondria, due to an alteration on its DNA.

#### Methods

To demonstrate the importance of the presence of habitual pitfalls in the classification of Follicular Tumors in Thyroid's Aspiration Cytologies.

Three samples of thyroid's FNA are presented, whose collection and smears were performed by the radiologist. All slides were stained, using the Papanicolaou and Giemsa methods, and were later diagnosed as Follicular Tumours, encompassed as category IV from Bethesda's Classification System.

#### Results

Of all three cases, which underwent surgery, one was diagnosed histologically as a Follicular Adenoma, while another turned out to be a Warthin-like variant Papillary Carcinoma and the last one was a high-cell variant Papillary Carcinoma.

#### Conclusion

When a cytohistological correlation is done in Follicular Tumours with an oncocytic phenotype, histological results of papillary carcinoma are observed with some frequency. Once samples with the presence of these cells can cause pitfalls, including heterogeneity of the assessed morphological characteristics.

## Diagnosis and monitoring of noncommunicable diseases

PO - (AM2021-27745)

### MMP-2, MMP-9, TIMP-2, TIMP-1 IN BLOOD-BRAIN BARRIER DYSFUNCTION AND COURSE OF MULTIPLE SCLEROSIS

Ana Valado<sup>1,2,3</sup>; Maria João Leitão<sup>4</sup>; Livia Sousa<sup>5,6</sup>

**Keywords:** MMP-2, MMP-9, TIMP-2, TIMP-1, MS

1 - Polytechnic Institute of Coimbra, Coimbra Health School, Department of Biomedical Laboratory Sciences, Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854, Coimbra; 2 - Laboratory for Applied Health Research (LabinSaúde), Rua 5 de Outubro - SM Bispo, Apartado 7006, 3046-854, Coimbra; 3 - Marine and Environmental Sciences Centre (MARE), Faculty of Sciences and Technology, University of Coimbra, 3001-456, Coimbra, Portugal; 4 - CNC-Center for Neuroscience and Cell Biology, University of Coimbra, Largo Marquês de Pombal, 3004-517 Coimbra, Portugal; 5 - Department of Neurology, Centro Hospitalar e Universitário de Coimbra (CHUC), Praceta Prof. Mota Pinto, 3000-075 Coimbra, Portugal; 6 - Faculty of Medicine, University of Coimbra, Rua Larga, 3004-504 Coimbra, Portugal

#### Background

Multiple sclerosis (MS) is a multifactorial, inflammatory, autoimmune and demyelinating pathology, with suspension of nerve transmission in the CNS. The blood-brain barrier (BBB) is an endothelial structure composed of several cell types and matrix components, such as metalloproteinases (MMP), a vast family of proteolytic enzymes known for their ability to degrade the components of the extracellular matrix.

#### Aims

Compare and evaluate serum and cerebrospinal fluid (CSF) levels of BBB dysfunction markers such as MMP and their inhibitors, as well as the MMP/TIMP ratio between MS patients and patients with other inflammatory (ID) and non-inflammatory (NID) diseases of CNS.

#### Methods

105 samples distributed of the groups: 51-MS, 21-NID and 33-ID. The concentration of MMP-2, MMP-9, TIMP-2 and TIMP-1 was determined in serum and CSF samples using microplate enzyme immunoassay (ELISA) and spectrophotometric reading.

#### Results

The concentration of MMP-2 in serum was higher in the MS group than in the ID. TIMP-2 there was a significant decrease in serum levels in the MS group, compared to the ID and NID. In MS patients, there was an increase in the MMP-2/TIMP-2 ratio in the serum and in the MMP-9/TIMP-1 ratio in the CSF.

#### Conclusion

MMPs are involved in the pathogenesis of MS. The MMP-2/TIMP-2 ratio appears to be specific to MS. As for disease progression, the increase in MMP-2 is associated with a more aggressive phenotype, while an increase in the MMP-9/TIMP-1 ratio seems to be associated with a lower degree of disability in the course of the disease.

# ANNUAL MEETING 2021



**Coimbra  
Health School**

Polytechnic of Coimbra

Proceedings of the 7<sup>th</sup> Annual Meeting

## Global Health | New Trends

**ESCOLA SUPERIOR DE TECNOLOGIA**

**DA SAÚDE DE COIMBRA**

Rua 5 de Outubro

S. Martinho do Bispo

3040-854 Coimbra

Portugal

