

Poster Week 18/2022

ABSTRACT BOOK



POSTER WEEK

**Escola Superior
de Tecnologia
da Saúde**

Politécnico de Coimbra

November 21th – 25th 2022

PEDAGOGICAL-SCIENTIFIC COMITEE

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SCHEDULE

Calendário **Poster Week 18/2022**

	2ªf 21/nov	3ªf 22/nov	4ªf 23/nov	5ªf 24/nov	6ªf 25/nov
8-9h					
9-10h				Rui Cruz: 7P Curso: Farmácia 3º UC: Organização, Gestão e Qualidade em Farmácia	Diana Martins: 9P Curso: CBL 3º UC: Morfologia e Histotecnologia
10-11h					
11-12h		Ana L. Baltazar: 9P Curso: DN 2º UC: Composição Nutricional dos Alimentos			Ana Baltazar: 7P Curso: Farmácia 3º UC: Nutrição
12-13h					
13-14h					Joaquim Pereira: 6P Curso: Físio Clínica 4º UC: Investigação Aplicada 2
14-15h		Jorge Baiteiro: 10P Curso: Farmácia 2º UC: Tecnologia e Farmácia Galénica I	Hélder Simões: 6P Curso: SA 2º UC: Saúde Ocupacional		
15-16h	Cristina Santos: 8P Curso: SA 3º UC: Qualidade e Segurança Alimentar				
16-17h		Célia Gomes: 8P Curso: DN 3º UC: Genética		Ana C. Lança: 6P Curso: SA 1º UC: Epidemiologia	Paulo Matafome: 9P Curso: Fisioterapia 1º UC: Fisiologia I
17-18h	Cristina Santos: 6P Curso: SA 2º UC: Gestão da Qualidade da Água I			Ana C. Lança: 3P Curso: SA 3º UC: Infecção Hospitalar	
18-19h				Ana C. Lança: 8P Curso: SA 2º UC: Gestão do Habitat	
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A48 – A54	Organization, Management and Quality in Pharmacy	Pharmacy
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ABSTRACTS



FOOD SAFETY AND THE CONSUMPTION OF SUSHI AND SASHIMI - CONSUMER PERCEPTION

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Sushi is a traditional Japanese dish made from raw fish and shellfish, Japanese rice, and seaweed. It is combined with other ingredients such as fruits, vegetables, ginger, and soy sauce. Sashimi is a Japanese delicacy that consists of pieces of fish or seafood such as tuna, salmon, or squid. They can be served cooked, raw, marinated, and with or without condiments.

Given the growth in popularity of these products in Portugal, it is of interest to understand how consumers perceive their food safety, so we conducted a literature review on the subject and applied a questionnaire to the general population.

We found that at the level of information on measures to be taken in the preparation, at least 75% of responses showed consumers' knowledge. As for the storage of products, we registered about 70% of the answers, with some cases where a lack of information was noted. As for the dangers, we found that what worries consumers the most is food poisoning, with more than 80% of the answers. In general, on a scale of 1 to 5 (1-very bad, 5-very good) 42.4% consider their level of information to be 3 (reasonable).

As these are foods that are not usually cooked after handling, they have a high potential for biological, physical and chemical contamination because they are not eliminated by heat, as happens in food confection, so it is necessary to respect the ideal safety conditions both in the preparation and storage of these products.

Keywords: sushi, sashimi, food safety, safe behaviors, contamination.

FOOD WASTE IN RESTAURANT AND DRINKING ESTABLISHMENTS

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Food waste has no right or wrong definition, but it's said to be food fit for human consumption that is discarded or left to deteriorate at the consumer level, regardless of the cause. This type of waste occurs from the field to the fork, which prevents us from having an idea of the size of the amount that is wasted. In restaurant and drinking establishments there are 3 types of food waste: those generated in the preparation of meals, those resulting from the prepared meal, and those resulting from the meals served. To reduce this food waste requires an effort from all agents of the agri-food chain, in order to reduce environmental pressure and to allow the development of actions for change.

This work aims to evaluate the amount of food waste in restaurant and drinking establishments. For the accomplishment of this work, a literature review was performed, and a questionnaire was applied to employers and employees of several restaurant and drinking establishments.

Of the 95 respondents, a large percentage (81,1%) has a notion of what food waste means, with employees having a greater notion of the waste generated than employers. The various establishments report that they apply measures to avoid food waste, such as giving customers the option to take home (62,6%).

Through this study, we conclude that this population is informed about food waste and that it's due to the appearance, quality, expiration date or other reasons, such as not consuming the entire meal.

Keywords: Food Waste, Reduce, Foodstuffs, Restaurant Establishments, Drinking Establishments

CLIMATE CHANGE AND THE IMPLICATIONS FOR FOOD SECURITY

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According to the World Food Conference, food security occurs when all people have permanent physical, social and economic access to safe, nutritious food in sufficient quantity to meet their nutritional needs and food preferences for an active and healthy life. Climate change influences food security, directly to human health by causing death, and indirectly as food contamination.

With this work we intend to make a reflection on climate change and the implications on food security and applied a questionnaire to the population to understand the level of knowledge on this topic. Of the respondents, 85% agree with the fact that climate change has consequences on food security, since 70.7% responded that the main influence is water scarcity, and 61.3% emphasize extreme weather situations. Water scarcity causes damage to agriculture, which has a major impact on global trade, climate change can affect the increased frequency and intensity of weather events. There are increasingly problematic health situations due to dietary problems caused by poor nutrition, 32% of respondents believe it has to do with food availability, and 48% emphasize it is due to food production.

Consumers are more demanding with product quality and are more concerned with the environmental impacts allied, and it is in this context that the concept of sustainable food arises, which appears as a possible solution in achieving a better balance between food production, health and environmental protection.

Keywords: food safety, climate change, environment, health

FOOD BEHAVIORS OF HIGHER EDUCATION STUDENTS

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A varied, complete and balanced diet is the way to a healthy life. A way that has to be followed based on information and knowledge, which is acquired according to the experiences and culture of each individual. Entering higher education is an important stage in students' lives. This new cycle gives rise to great vulnerability to incorrect eating behaviours, directly harming adolescents. With this article, we intend to assess and compare the eating behaviours of students before and after entering higher education; to this end, we applied an online survey and conducted a literature review.

We found that young people in higher education feel great difficulty in maintaining the balanced diet they had before entering university. This is evidenced by the 59.8% of students who stated that their eating habits worsened after entering higher education, the 40% who rarely consumed vegetables, the 43% of students who almost always consumed alcoholic beverages and the 29% who almost always drank coffee, in contrast to the good eating habits practiced before entering higher education.

Stress, lack of time, easy access to fast food and inability to cook are the main factors for the declining dietary quality of students after entering higher education. Thus, it is necessary to inform and alert students to the practice of healthy lifestyles, preventing bad food addictions from extending into adult life, avoiding sedentarism, which is very frequent among students.

Keywords: Eating Behaviors; Eating; Lifestyles; Higher Education, Education, Students

FOOD SAFETY IN THE USE OF LUNCHBOXES

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Food security has never been as assured as it is today. People set their own eating patterns, depending on the pace of their lives.

This increases the demand for ready and semi-ready meals, foods that are easy to prepare. As far as consumption outside the home is concerned, the concept of meals in small portions, packaged products for individual consumption, and products for eating on the road or in other circumstances is emerging. The so-called "lunch box fashion" is emerging, as an option to the use of canteens. In our country there are more and more people taking their meals to work/study, so the cafeterias are beginning to adapt to this reality and to be equipped with the necessary conditions. The objective was to assess the level of knowledge and good practices on food safety in the use of lunch boxes through the application of a questionnaire and a literature review.

Although 68.5% of the population knows that heating food in plastic containers harms health, due to the release of harmful particles, plastic containers are still the most used for transporting food (88.8%) and heating it (30.8%). The reasons why people use lunch boxes are to avoid food waste and to reuse the leftovers for other meals (61.5%) and for economic reasons (44.8%). It was possible to see that there is a great lack of information among the population regarding the safe temperature at which food should be kept, with only 5.6% of respondents answering correctly.

After these results it would be important to conduct awareness campaigns, since the lack of knowledge about food safety is one of the main causes of foodborne diseases.

Keywords: Food safety, lunch boxes, plastic containers

FOOD SAFETY IN FOOD DONATION

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Access to sufficient food is one of the most basic universal rights of every individual, without which survival is compromised.

The concept of food security is important when it comes to food donation. This is because it is not enough just to donate leftover food, one must keep in mind that it needs to be safe and healthy. Food donation contributes to sustainable development - the fight against poverty and food shortages.

The aim of this work was to assess the level of knowledge and perception of the population on this subject. The preparation of this work involved a bibliographic search and the collection of data through a questionnaire applied to the population.

With the same, we ascertained that a large part of the respondents are well informed on the subject, for example, with regard to the perception of the donation of foodstuffs, 65.2% claim to have knowledge of companies which donate foodstuffs. On the other hand, 53.9% responded that it should not be compulsory for companies to donate foodstuffs, which is a negative result.

Currently, the problem of food waste is on the political agendas, but it is still difficult to control and manage, as there is a lack of awareness of its environmental and economic impact.

The role of the environmental health technician should not be set aside, as their qualifications and skills are crucial for health protection, disease prevention, population awareness, especially in countries where there is no Environmental Health, as is the case of Venezuela.

Keywords: Foodstuffs; Donation; Food Safety; Food Waste

THE IMPACT OF THE PANDEMIC ON EATING BEHAVIOUR

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The COVID-19 pandemic, caused by the SARS-CoV-2 virus, had a direct impact on the lifestyle, habits, and behaviors of the world's population, including those related to food handling and consumption. Because it is a new viral strain, little information was available about the virus, including questions about virulence, survival time on surfaces, viability in food, mode of transmission, spectrum of symptoms, prognosis, treatment, and prevention.

With this work, it was intended to analyze the impact that the Covid-19 pandemic had on the food of the population and consequently on their health and well-being. In turn, to also understand the level of knowledge about the consequences of eating habits acquired with the pandemic. The methods used were based on a literature review of the topic, and subsequent data collection through a questionnaire.

Although the majority of the population, 38.3% stated that their weight did not increase during the pandemic, only 22.3% of the respondents adopted a new diet during the confinement. Furthermore, it is important to note that 75.5% of the respondents stated that their mental state influenced their diet, and that when they felt nervous/anxious 53.2% of the population opted for sweets and chocolates.

Thus, it was possible to realize that the pandemic influenced the psychological state of people, making them more nervous and anxious, and consecutively their eating habits. However, despite these bad eating habits influenced by the pandemic, 20.2% of the respondents found in physical exercise a way to deal with stress and anxiety.

Keywords: Pandemic, Stress, Physical Exercise, Diet

PERCEPTION OF THE EMPLOYEES REGARDING FOOD WASTE AND QUALITY IN CANTEENS OF EDUCATIONAL ESTABLISHMENTS

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School is essential in the formation of eating habits. The improvement of the meal service is only possible thanks to school canteens being privileged spaces for health education, aiming at the promotion of healthy lifestyles and social equity, by providing nutritionally balanced, healthy and safe meals to all students, regardless of their socioeconomic status.

This work aimed to evaluate the quality of the meals served, the existing waste and its relationship. To understand if and what measures are in place to avoid or reduce waste in schools. The preparation of this work included the analysis of several articles related to these themes and the completion of a questionnaire applied to the employees of certain canteens.

The quantity and quality of food served are central and extremely important aspects that must be thought out and restructured, since only 52.6% of employees said that the quality of food served is "always good" and that they never exaggerate the quantities served. From here we can verify the direct relationship between quality and food waste.

Most of the employees (73.7%), stated that the leftovers are donated to social institutions.

The integration and interaction of Environmental Health Technicians in multidisciplinary teams is essential in order to play an active and positive role in educational institutions, investing in a clear and necessary social commitment to the health of the school community, the health of the population in general and the health and sustainability of the planet.

Keywords: food quality; school canteens; food waste; leftovers; healthy eating

WASTE OF WATER-ASSESSMENT OF GOOD PRACTICES

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Currently, water waste is increasingly present, due to the misuse of this resource by the population, especially at the industrial, commercial, residential and agricultural levels. The waste of water has several impacts, namely the reduction of water supply for the population and the occurrence of water crises in times of drought.

This study aimed to evaluate the waste of water in the general population using as a methodology the literature review on the subject and the application of a questionnaire. The following results were obtained, that 50% of the respondents take between 5 and 10 minutes to take a shower, 81.5% have the habit of brushing their teeth with the tap turned off, 53.2% wash the dishes by hand and of these, 77.1% turn off the tap while washing. In addition, we also recorded some worrying data, 53.2% of individuals never have the habit of using the cold water that comes out until it reaches hot water in the bath, and 62.1% responded that they do not reuse rainwater.

Most respondents consider that the measures to be taken by entities to avoid wasting water are the detection and repair of water leaks and the capture of rainwater for irrigation of public spaces.

In short, it is important that there is good water management by society. More campaigns to raise awareness of water waste should be created, especially in schools.

Keywords: water waste, water management, awareness campaigns.

CLIMATE CHANGE AND THE IMPLICATIONS FOR WATER QUANTITY AND QUALITY

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Climate change refers to long-term changes in climate patterns. Associated with these changes are various consequences, which not only damage our environment but also our health. A safe supply of drinking water is fundamental for a healthy society. Access to good quality, reliable water should be a right for every human being.

The aim of the study was to demonstrate the role that climate change will play in the management of water quality and quantity, to express the importance of a more sustainable management of this resource and to assess the population's knowledge on this issue.

In order to carry out this work, we resorted to the analysis of some scientific articles and applied a questionnaire addressed to the population in order to understand their knowledge about this theme.

Of the 79 respondents, 83.5% consider that the main effect of climate change on water resources is a decrease in the quality of surface water. About the factors of water quality that can affect their health and well-being, 82.3% stated that it is food safety and 74.7% water-borne diseases.

It was concluded that climate change may have implications on the quantity and quality of sustainable water management, and that the impacts of these extreme phenomena may have consequences on the health and well-being of the population and remaining ecosystems.

Keywords: Water Resources, Climate Change, Quality Management, Quantity Management, Extreme Phenomena

WATERBORNE DISEASES

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Waterborne diseases are progressive and universal, where it is necessary to have a constant monitoring of the proper equipment, access to water, specifically in relation to the health of the populations.

With this work, we intend to get an overview of what the populations of today understand about waterborne diseases, as well as if they are aware of their gravity and consequences.

To carry out this work, a bibliographic review on the theme was made and a questionnaire was applied to the general population.

According to the results and discussions, we found that the majority of the population is aware of the existence of waterborne diseases (84.8%) and their forms of prevention. They consider that the most effective measures to prevent them are, the existence of basic sanitation (93.2%), washing food with drinking water before consumption (63.6%), correct maintenance of water distribution equipment (71.7%), supporting institutions that aim to improve public sanitation (67.4%). Thus, we call for these measures to be maintained and for us to achieve other attitudes that benefit the non-existence of waterborne diseases, improving the health of the population.

We conclude that people are aware of the issue, causes, and dangers associated with it, and have already taken some precautionary measures to prevent the onset of these diseases. However, it is still necessary to take other measures that are also important, taking greater care regarding this issue.

Keywords: Waterborne diseases, health, consumption, preventive measures and attitudes

THERMAL WATERS AND PUBLIC HEALTH

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Thermal waters are known today as mineral waters with therapeutic properties.

Some benefits are to replace the mineral salts and antioxidants lost by the skin, decrease skin greasiness, balance the PH and reconstitute the skin's protection barrier, aid in aesthetic treatments, treatment for patients with chronic diseases, bring a feeling of comfort and well-being. We understand Public Health as the whole set of measures carried out by the State to ensure the physical, mental, and social well-being of the population.

This work aimed to understand and raise awareness of how thermal waters influence our health and evaluate measures on it.

To develop this work, we resorted to the research of scientific articles and a questionnaire applied to a random population.

From the questionnaire, we obtained 51 answers with the following results: all the respondents answered that thermal waters influence health; 64.7% indicated as benefits of thermal waters the treatment of patients with chronic diseases and the feeling of comfort and well-being. Regarding the treatment of diseases through thermal waters, 62.7% answered skin diseases, 51% respiratory problems, and 39.2% cardiovascular diseases. 37.2% answered Strongly Agree and 43.1% Agree to the statement, The quality of the thermal waters offer quality guarantee and 29.4% mentioned Strongly Agree and 45.1% Agree to the statement, The facilities and equipment offer guarantees of hygiene and safety.

The population is informed about hot springs and their effects on health and the hygiene and safety conditions of the facilities and water quality.

Keywords: Thermal waters, Public health, Water quality, Population health

CONTRIBUTIONS TO SUSTAINABLE WATER MANAGEMENT IN PORTUGAL

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Water is a natural and renewable resource with great economic, environmental and social impact. However, due to population growth, it was found that waste production and water and electricity expenditure are increasing, and can harm and cause harm to nature, so having access to quality water is one of the greatest challenges for man.

This work aims to evaluate the knowledge and practices of water use by the Portuguese population, as well as to raise awareness and awareness of sustainable water management.

A questionnaire was conducted with 32 individuals, with the majority of the population considering and valuing the importance of water and its management (93.8%), and 65.6% of respondents take quick showers in their daily life. Given this, we conclude that the participants are already aware of the theme, however there is still some lack of perception for better management of this resource.

As water is an essential good for all living beings, there is a huge concern with its preservation in the face of the quantity and quality of fresh water available. Having said that, it is important to educate society in order to change the mentality in which it aims to improve the quality of life of man, water and the planet.

Keywords: sustainability; common good; availability; water; waste

SUSTAINABLE WATER MANAGEMENT

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Water is an essential resource for life, in particular that of human beings. Over time, the population began to use water in an unconscious way, without thinking that one day this natural resource may be exhausted.

The objective of this work was to evaluate the knowledge about sustainable water management of higher education students. This is an important issue for society as it is related to sustainable development, so that it meets the needs of the human being in the present, without compromising the capacity of future generations to meet their own needs.

An online survey was carried out and applied to higher education students to assess whether in their daily lives they develop good practices for sustainable water management, to which 40 responses were obtained. We found that the majority (51.4%) apply measures to save water, such as closing the tap while soaping their hands (77.1%). However, there is still a long way to go for there to really be good water management by the population, developing habits such as taking a considerably short bath, and from the results 46.5% takes about 10 minutes.

One of the current challenges is to establish changes in the habits of society with simple attitudes that can make a difference, using actions to sensitize the population, with the objective of not negatively compromising future generations.

Keywords: water; management; higher education students

ISOTONIC DRINKS AND ATHLETES

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Introduction: High-performance athletes regularly use isotonic drinks to replace water, nutrients and minerals lost through sweating during physical activity.

Objective: The research aims to compare and analyze the labels of different brands of isotonic drinks. It took into account the content of macronutrients and energy balance.

Methods: Isotonic drinks were selected as the base product to carry out the comparison and analysis of labels between the different brands that are on the market. Different brands of isotonic orange-flavoured drinks were researched, of which only 5 were selected for analysis and label comparison.

Results: Based on the labels observed, it was concluded that all 5 brands have the same amount of kcal, ranging between 19 and 30 kcal per 100 ml, and none of these drinks has fat. As for carbohydrates, there is also no great variation, the drink with the least is brand C, with 4.4g per 100 ml, and the one with the most is brand D, with 7g per 100 ml. In terms of sugar content, brand E has a low sugar content, and the other brands (a, b, c, d) have a medium sugar content level. These drinks also feature 0g, all in protein. And finally, for salt, all brands have low levels.

Conclusion: It was concluded that all these brands have labels with similar values, and where there is a greater variation is in carbohydrates and sugar.

Keywords: Keywords: food labelling; nutritional composition; isotonic drinks; macronutrients; energy

COMPARATIVE ANALYSIS OF SOY VEGETABLE BEVERAGES

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Introduction: There has been an increase in vegetable beverage consumption. Although these do not replace cow's milk, they can be a good alternative for vegetarians, vegans, or people with intolerances/food allergies. From a nutritional point of view, soy drink is the closest to cow's milk.

Objective: To Analyse the different soy beverage's labelling from distributor brands and to compare them with nutritional values of cow's milk.

Methods: Eight supermarkets were visited, the distributor's brands were selected, and information was collected regarding the nutritional aspects of 36 products, such as: the content in macronutrients, energy, vitamins and minerals. These were analyzed and compared with cow's milk (INSA).

Results/Discussion: The soy beverages analyzed present similar lipid content compared to cow's milk (1,9g/100ml), [1,2g and 2,1g/100ml], C and E brands, with chocolate flavour, have the same amount of lipids as cow's milk. Plain soy beverage is the most similar to cow's milk in carbohydrate values (4,9g/100ml); D brand is the most approximate, nonetheless, with lower quantities of sugar. As for protein, cow's milk has 3,3g/100ml, brands with the same values are A and E, with chocolate and vanilla flavour. Although they present the same amount of protein, they are the lowest in nutritional quality because of their sugar content. All soy beverages present a lower value of saturated fats than cow's milk, which is an advantage.

Conclusion: In nutrition's professional practice, it is essential to know alternatives to cow's milk. We were able to compare the different 36 soy beverages, and later with cow's milk, concluding that D brand's plain soy drink is the most recommendable. Nonetheless, one must always consider the list of ingredients and nutritional information available.

Keywords: Nutrition, Nutritional Labelling, Soy vegetable beverage, cow's milk

ANALYSIS OF THE LABELING OF PROTEIN PUDDINGS

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The inclusion of protein puddings on people's diet has been increasing in recent years for several reasons. Some people eat them before the practice of sports, and others just for pleasure and with no interest in their nutritional composition.

The main objective is to analyze the labeling of protein puddings and understand if these products are nutritionally interesting for daily consumption.

The nutritional label of four different brands of chocolate puddings were analyzed. To guide the analysis of the labelling was used the Ebook "Rotulagem alimentar: um guia para uma escolha consciente" by APN and two articles, one from PubMed and other from Taylor & Francis Online both from 2017.

Analyzing the labels of the four puddings, we conclude that they have a high energy value (containing more than 40kcal); however, they have a low sugar content (less than 5g), a low fat content (less than 3g), a low salt content (0.3g or less) and a high protein content (10g). In this way, they have the ability to reduce possible feelings of appetite and hunger cravings.

Labels must always be present, providing all necessary information to supply knowledge so consumers can make conscious choices. With the analysis of the chosen labels, we can conclude that they all follow the labeling standards and do not mislead the consumer.

Keywords: nutrition, protein puddings, energy intake, labeling, protein supplements

THE AVAILABILITY AND NUTRITIONAL ADEQUACY OF GLUTEN-FREE BREAD

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Introduction: Celiac disease (CD) affects 1% of the population in Europe. Gluten is a collection of stored proteins in major cereals, such as wheat, barley, and rye, which compromise the main components of common foods, such as bread. When consumed, gluten proteins trigger an immune-mediated enteropathy, leading to intestinal damage in genetically pre-disposed individuals. Management of celiac disease requires the removal of gluten from the diet, which proves a challenge for CD sufferers due to the presence of gluten in many products.

Objective: Perform a comparative analysis of gluten-free bread, assessing its nutritional quality as part of a healthy diet and examining the availability of these products.

Methods: Information such as nutrition declaration, price, brand and place of manufacture was collected for 18 gluten-free commercial pieces of bread in the five major Portugal supermarkets through online retailer websites. The nutritional quality was evaluated through a food label decoder.

Results: The varieties obtained were rustic bread, white bread, cereal, or seed bread. These were marketed by nine supplier brands, produced in three different countries. All the products have the recommended amount of saturated fatty acids and salt. According to the nutritional decoder, with regard to lipid content only two types of bread are at a level considered ideal. Only 6 types of bread are at the ideal limits for the sugar content.

Conclusion: The analysed products meet the recommended standards, but gluten-free bread doesn't mean healthier bread. There's no single indicator of a product's nutritional quality. The objective was successfully accomplished.

Keywords: Food labels; gluten; gluten-free bread

IS SKYR YOGHURT A GOOD OPTION FOR A HEALTHY LIFESTYLE?

Mariana Cruz, Mariana Martins, Melânia Vilar, Teresa Alves

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Introduction: Skyr yoghurt is known for its high protein content, is virtually fat-free and low in calories, and promotes greater satiety. The main difference between skyr yoghurt and regular yoghurt is that it's made with low-fat/skimmed milk.

Aim: To carry out a comparative analysis of strawberry-flavoured skyr yoghurt, to evaluate its nutritional quality and to compare it with a semi-skimmed, flavoured, sweetened yoghurt, identifying which one is better for a healthy diet.

Methodology: Information was collected from the nutritional declaration of strawberry-flavoured skyr yoghurts from 5 different retailer brands and 1 private label brand. The following parameters were compared and analyzed: energy value, sugars, protein, lipids and saturated fats.

Subsequently, as mentioned earlier, we calculated the average value of the parameters to compare them with the respective values of the semi-skimmed yoghurt.

Results: The labels of the respective 6 Skyr yoghurts were analyzed, and it was concluded that, in 100g, brand C has the highest amount of sugars (9g), while brand F has the highest amount of protein (8.9g). Brand D has the highest values for lipids (3g) and saturated fat (0.5g).

Regarding the parameters analyzed, their average is: Sugars: +/- 5.85g; Protein: +/- 7.2g; Lipids: 0.7g; Saturated fat: +/- 0.17g. The F-brand yoghurt has the most appropriate nutritional values for a healthy diet, as it contains the lowest values of sugar and the highest values of protein. In addition, skyr yoghurts are nutritionally richer than semi-skimmed yoghurt since they are higher in sugar and fat.

Conclusion: The aim was reached as the f brand's yoghurt proved to be the best for a healthy diet.

Keywords: "food labelling", "nutritional quality", "nutrition declaration", "skyr yoghurt."

NUTRITIONAL LABELLING ANALYSIS OF FIBER-RICH BREAKFAST CEREALS FOR ADULTS

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Introduction: According to the Portuguese Association of Cereal Flake Producers (AFLOC), Portugal is one of the European countries with the highest annual consumption of cereal flakes per capita. Consumers are increasingly looking for healthier options, rich in fiber or protein, low in carbohydrates and free from artificial colours and flavours. In this sense, labelling is essential in accessing information about food products, facilitating more conscious choices.

Objective: Analyze and compare cereal flakes' nutrition labeling and present the best fiber-rich breakfast options for adults.

Methods: Food labelling analysis of breakfast cereals rich in fiber on commercial surfaces and exclusion of those that had other ingredients in their composition, such as fruits, chocolate, among others.

Results/Discussion: Of the 38 cereals analyzed, 11 were selected because they had a high fiber content, containing, at least, 6g of fiber per 100g. Considering the nutritional constitution, A, B, C and D stood out, not only for their high fiber content, but also for being the most balanced in nutritional terms. There is a wide variety of high-fiber cereals on the market, however, only a few healthy options, which are not high in saturated fat, sugar and salt. From the entire sample, the A whole grain cereal is the only one that, despite being rich in fiber, is low in salt, sugar and saturated fat. There are several options on the market, so it is important to analyze the labels to always make the best choices.

Conclusion: The main objective of the study was achieved.

Keywords: Nutrition; Food labelling; Breakfast Cereals; Fiber

ANALYSIS OF OMEGA-3 CONTENT IN VARIOUS TYPES OF FISH AND HIS RATIO WITH OMEGA-6

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Introduction: Omega-6 and omega-3 polyunsaturated fatty acids are essential and can be obtained through food, predominantly fish. Thus, it can not be synthesized by humans because it lacks endogenous enzymes for omega-3 desaturation. A balanced ratio of omega-6 to omega-3 is critical to human development in preventing chronic diseases if ingested in the right proportion. **Objectives:** Analyze the content of omega-3 in fish and its relationship with omega-6 and try to understand which fish are the most accessible to the Portuguese, taking into account their nutritional quality.

Methodology: In October 2022, a literature review was conducted mainly through the Associação Portuguesa de Nutrição, INSA, IPIMAR and PubMed. Eighteen articles were found from the last ten years. After reading them, seven articles were selected for full analysis.

Results: Analyzing the fish present in the food composition table, we evaluated them according to the fat content and we concluded that is not proportional to the amount of omega-3 and omega-6. Moreover, fish with a higher fat content contains higher values of omega-3 and omega-6. It's recommended a daily consumption of 250 mg EPA + DHA and the omega-3:omega-6 ratio must be 3:1. In Portugal, the average consumption of fish is 42g/day.

Conclusion: The objective has been completed. Yet, we couldn't analyze 6 of the 42 fish. Thus, It can be concluded that a bigger content of omega-3 can be found in fatty fish.

Keywords: "Omega 3"; "EPA and DHA"; "Omega-6 and Omega-3 fatty acid ratio"; "Fish"

SPIRULINA SEAWEED CONTAINS BENEFICIAL COMPONENTS FOR THE HUMAN ORGANISM

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Introduction: There is a growing demand for ingredients of natural origin, instead of chemicals, contributing to a great expansion of the food industry. Algae have antioxidant and antiviral activity and constitute a diverse group of autotrophic species. Microalgae are planktonic, found at the base of the food chain of aquatic ecosystems.

Objectives: To know the benefits of a component of Spirulina algae in humans.

Methods: The scientific research for this paper was based primarily on academic Google. Ten articles were obtained, of 4 were used concretely.

Results / Discussion: If we compare 100g of spirulina with 100g of chicken steak, spirulina contains 65,9g of protein and steak 20g. The recommended serving of spirulina is 3 to 6g per day, that is, 2 to 4g of protein, so this benefit is hardly obtained. For antioxidant evaluation, the DPPH, ABTS and FRAP methods were tested together with the extract, to observe the radical inhibition.

Spirulina has important phenolic compounds, due to the antioxidant benefits they bring. Among the natural antioxidants, phenolic compounds stand out, as they are able to give up hydrogens to stop the oxidation of free radicals and inhibit enzymatic activity.

Conclusions: Foods containing these compounds help reduce oxidative damage related to aging and diseases such as arteriosclerosis, diabetes and cancer. Therefore, the application of these compounds is promising, not only for food preservation, but also for health.

Keywords: Spirulina; algae; phenolic compounds; benefits

IS VEGAN CHEESE WHAT IT APPEARS TO BE?

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Introduction: Interest in following a vegan diet has grown increasingly. Therefore, we studied products within the same range - vegan cheeses based on coconut oil.

Objective: To understand whether coconut oil-based vegan cheeses are a good alternative to Flemish cheese, both nutritionally and economically.

Methodology: One hundred labels of vegan cheeses were found and analyzed, of which five were selected since they met the chosen requirements: coconut oil based cheese. In conventional cheese INSA value for Flemish cheese was used.

Economically, market average were used.

Results: Vegan cheese: energy 268 kcal; lipids 21.4 g, saturated 19 g; carbohydrates 18.6 g, sugars <0.2 g; proteins <0.6 g; salt 1.62 g; vitamin B12 910 mg; calcium 380 mg and 2,20€.

Flemish cheese: energy 282 kcal; lipids 18.7 g, saturated 10.1 g; carbohydrates 0.2 g, sugars 0.2 g; proteins 28 g; salt 2.4 g; vitamin B12 0.0019 mg; calcium 830 mg and 1,10€.

Discussion: Energy, lipids and sugar values are similar; saturated fats, carbohydrates, protein show a discrepancy. Although most of the vegan cheeses are fortified in vitamin B12 and calcium the values are very different. Economically a vegan cheese is twice the price of a Flemish cheese. All the values were an average and compared per 100g.

Conclusion: Although appearance and taste are similar, the designation "vegan cheese" makes no sense in nutritional terms and is much more expensive.

Keywords: Vegan cheese, Flemish cheese, alternative.

STARCH CAPSULES

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Starch capsules were the first capsules to be introduced into the therapeutics. These are pharmaceutical forms that began to be diffused from the 19th century. They are made with starches or starchy flours of (wheat, rice, maize, cassava), have a leaf shape rounded or oval and colored white, flattened at the edges and concave in the center projected to receive solid drugs. Capsules are made up of a two-part casing, which vary in size, shape, dimension, and nature, and within it we find the drug substances. The starchy wafers had significant dissemination until the mid-twentieth century, being later replaced by gelatinous capsules, more suitable for the industrial production. As advantages of the capsules, we have their easy handling and swallowing and their rapid release, in addition, they present flexibility in dosage and an attractive presentation and may have color and even be opaque or transparent, another great advantage is the variety of routes of administration of the capsules it can be oral, vaginal or for external use. As for the disadvantages, from a biopharmaceutical point of view, the size and structure of the crystals, type and number of excipients can interfere with the speed of therapeutic action and have a dose concentrate that can cause irritation to the mucosa. In conclusion, over time the capsules have evolved and shown to be an important therapeutic form and the starchy capsules played an important role, as they were the first capsules to be introduced into therapy.

Keywords: Capsules, Starches, Therapeutic form

EUROPEAN PHARMACOPEIA

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The European Pharmacopoeia is a book, which goes into its eleventh edition, coming into force on January 1, 2023. The primary objective is to guarantee the quality of medicines. Due to the pharmacopoeia, all medicines in developed countries are nowadays industrially produced and then distributed. The European Pharmacopoeia requires certain essential elements such as quality standards, general standards of presentation, for the manufacture of medicine, monograph of finished products and standard terminology. The European Pharmacopoeia contains numerous general monographs for the manufacture of medicinal products, these general methods of analyzing substances and medicinal products and some requirements for the creation of pharmaceutical forms and their best presentation. Quality standards contain analytical methods to identify the substance and assess its quality and dosage. The European Pharmacopoeia has a legal status in the European Union and its recognized in the European Union's directives as responsible for establishing their official quality standards. That said, we can conclude that the European Pharmacopoeia provides the legal and scientific basis for quality control during the development, production, and marketing of medicines in European member states.

Keywords: European Pharmacopoeia, Quality standards, Monographs, Medicines

EUROPEAN MEDICINES AGENCY

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The EMA is an organization belonging to the European Union, founded in 1995. This was created with the aim of "Ensure the scientific assessment, supervision and safety control of medicinal products for human and animal use in the European Union", data taken from the agency's official website. With this study we intend to know better the institution, realizing how their various departments work and how its structure contributes to the evolution of the pharmaceutical world and the general population. Because of its contribution, the EMA has a number of beneficiaries from patients to those responsible for defining health policies. The organization is based on authorizing and monitoring medicinal products in the European Union and, as such, facilitate the development of medicines and their access to, strictly monitor the safety of medicinal products and provide relevant information to healthcare professionals who need it. However, not all aspects of drug regulation fall within the competence of the EMA. The Agency does not assess applications for marketing authorization or applications for authorization of clinical trials, does not evaluate medical devices and does not conduct research or develop medications. We conclude that the European Medicines Agency plays an essential role in the control, regulation and the sharing of information among health professionals. In order to improve the quality of life of the population, making possible scientific advances in the pharmaceutical field as we know it today.

Keywords: Medicines, Agency, European Union, Health

ORPHAN MEDICINAL PRODUCTS

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According to the EU, a medicine is considered “orphan” when it is intended for the diagnosis, prevention or treatment of a chronic pathology or that puts human life at risk and that does not affect more than 5 cases per 10,000 inhabitants. The COMP is the body that reviews applications for the designation of orphan medicinal products, approving them or not, taking into account their advantages and disadvantages in the therapy of rare diseases. There are currently over 200 EMA-registered orphan drugs for the treatment of over 5000 known rare diseases. Before the development of these specific medicines for a given pathology, it is common to use medicines already used for the treatment of other disorders, due to the cost involved in the research and development of the same. Related to orphan medicinal products, there are several controversies regarding the IP of each medicine. Regulatory agencies have introduced regulations to encourage research and development on new treatments for rare diseases. However, there are many companies that invest in the discovery of medicines for a disease that can affect approximately 30 people in the world. Pharmaceutical companies try to recoup their investment by selling them at higher prices. In this way, it has more years of protected marketing. Some technologies for researching this type of drug include personalized medicine, gene therapy and phenotypic screening.

Concluding, the orphan medicinal products should be considered a pharmaceutical commons as part of an established medicines handling practice, which is performed very rarely due to its high funding costs.

Keywords: Orphan Medicines, Rare diseases, Intellectual property, COMP

POWDER MIXERS

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A mixture can be defined as the process of distributing different parts of a system. Several types of mixtures stand out, such as the ideal mixture, the randomized, the structured and the total mixture. The main mechanisms of a mixing process are diffusion, convection, and shear. Segregation and randomization are considered opposite trends that act within the system in a dynamic way. In mixtures where adhesion phenomena are observed between particles, the differences in granulometric size don't favor segregation so much because the adhesion neutralizes them in a certain way. However, if these adhesion forces are insufficient, segregation tends to increase. The shear segregometers are the most adapted when one wishes to obtain a segregation kinetics. Mixers are used in continuous or batch. Batch mixers are of various types and are usually classified by the predominant mechanism or stirring system used. We could also classify the types of mixers according to mechanical design, existing the mobile tank mixers, mobile tank associated with a stirring element, fixed tank with internal agitation, multiple agitation systems, fluidized layer, and continuous mixers. Premix operations are used when there are uniformity problems in relation to a low concentration active ingredient that must be dispersed in large amounts of excipient, and high-speed stirring mixers are the preferred equipment when working with cohesive and high density powders. Some previous trials will perhaps be necessary to adjust the shear level.

Keywords: Mixers; Mixtures; Agitation; Segregation; Adherence

FACTORS THAT AFFECT DRUG STABILITY

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Pharmaceutical stability, according to the World Health Organization (WHO), is characterized by the ability of drugs to maintain their chemical, physical, microbiological, and biopharmaceutical characteristics within their shelf life and specified limits. The study of the stability of a drug is an important technique in clinical trials and in the Marketing Authorization (MA) because it assesses the safety, quality, efficacy, identity, potency, purity and innocuity of the product, from which its shelf life is determined. The loss of stability of medicines can derive from several factors that lead to the loss of their therapeutic effect and the formation of toxic degradation products. The stability of pharmaceutical products depends on certain factors, these being of extrinsic character, such as temperature, humidity, light and atmospheric gases, and of intrinsic character such as hydrolysis, oxidation and photolysis; regarding the design of the drug, we have as factors: polymorphism, incompatibility, pH, particle size, vaporization, pharmaceutical form, manufacturing process, packaging material, transport and storage. In conclusion, stability is the ability of the galenic form to maintain, within specified limits and throughout its period of storage and use, the same properties and characteristics that it had at the time of its manufacture, and there are several extrinsic and intrinsic factors that influence the stability of the drug.

Keywords: Drug stability; Pharmacovigilance; Extrinsic character; Intrinsic character

ROLE OF INFARMED I.P. IN QUALITY ASSURANCE OF MEDICINES

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Medicines are one of the most regulated subjects by developed countries. This regulation in Portugal is made by INFARMED I.P., which operates at the level of inspection and control of medicines and management of health products marketed in Portugal. It also ensures that the different stakeholders (manufacturers, distributors, prescribers, pharmacies and users) comply with all established obligations and procedures. For a new drug to be introduced on the market, it needs an AIM, which is designed by INFARMED I.P.. It's their responsibility to license the facilities for the manufacture of medicines, the entities responsible for the distribution and the activity of pharmacies and places authorized for the dispensing of non-prescription medicines. INFARMED I.P. also develops important work in monitoring the market, through the observatory for medicines and health products. Through the laboratory belonging to the Official Quality Assurance Directorate, surveillance and constant monitoring of the quality of medicines is carried out, being responsible for the national pharmacovigilance system through suspicion of possible quality problems, consisting in conducting laboratory tests. The tests performed in the laboratories use several physicochemical techniques (identification and determination of the active substance), biological (determination of biological potency) and microbiological (assessment of microbiological contamination). The results obtained are compared with the approved specifications, and the similarity of the drug is evaluated. In addition to everything related to the pharmacovigilance of the medicines, INFARMED I.P. provides important information for both users and health professionals.

Keywords: INFARMED I.P.; Medicine; Pharmacovigilance

TABLET COMPRESSION MACHINES

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A tablet compression machine is an electromechanical device that uses the compression force by exerting a predetermined amount of force, through molds and punches to transform the powder into tablets of uniform size and thickness, these are made of stainless steel.

The machines available are single-station or multi-station, both contain a funnel into which the powder is inserted, and the production capacity depends on the number of stations.

Single station ones are the simplest, with low production capacity and can be operated manually or automatically. These are known for high utilization rate, are easy to operate, ensure a low noise level and are cost effective in clinical trials. It consists of a pair of upper and lower punch system and a mold. Multi-station ones have a set of dies with lower and upper punches that are in constant rotating motion, this one has a complex design and structure. This specific kind is suitable for a large-scale production, as its hardness and weight can be independently controlled and having the advantage of reducing any product waste. Certain specifications on punches and dies can be chosen depending on the types of tablets we might want to produce and acquire. Despite in the 70's these tablet compressing machines were manual, currently these are fully automated, capable of being cGMP compliant, accurate, easy to clean, can ensure low maintenance and reduce in a significant number the production cost.

Keywords: Tablets; Powder; Machine; Punches

THE IMPORTANCE OF SIEVING IN PHARMACEUTICAL PROCESSES

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The size of the particles of a powder influence, and a lot, the preparation of a galenic form. Their dimensions change the properties of the dissolution of the drug, changing their bioavailability in the blood. If the tenuity of a powder fails, the therapeutic effect might be compromised. To prevent this from happening, the sieving technique is used. Sieving is an accessory technique that allows to separate solids with different granulometries, being possible to homogenize powders until the ideal tenuity. Through mechanic agitation, solids move on the mesh of the sieve, allowing smaller particles to pass, and leave retained the ones with bigger granulometry. This process is repeated several times, decreasing the opening of the mesh, until the pretended tenuity is obtained. To ease this operation, the sieves are numbered accordingly with the opening of the mesh, which means that sieves with smaller numbers, let only smaller dimension solids pass through it. According to the Portuguese Pharmacopeia, a powder can be characterized as a course powder, medium thin, thin and very thin, according to the number of the sieve. At laboratory scale, sieve columns are resorted, which contains sieves fitted on top of each other, where the smaller particles will stay conditioned on the base, this way sieving time is lowered and also the waste, because the top of the column contains a closed sieve. After that, we can understand that sieving is an indispensable technique for the preparation of a powder as a final galenic form, and also as a medium for the following preparation of pharmaceutical forms.

Keywords: Sieves; Tenuit; Particles; Therapeutic effect

MODIFICATIONS INDUCED BY PULVERIZATION

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Pulverization consists on the process of reducing the drug to powder, using the process most suited to the nature of the material to be pulverized and the tenuity of the powder to be obtained. After the pulverization process, several physical or chemical changes can occur to the powders, in terms of color, odor, flavor, volume, density, hygroscopicity, efflorescence and solubility. As for the color, powders are generally lighter than the drugs from which they come, resulting from the reflection of light. The size of the particles affects the volume of air between them, which is of special interest in a powder composed of simple powders of different strengths. The density of the powders is identical to the density of the drugs that originate them. In general, in terms of hygroscopicity, powders show a greater affinity for water than non-pulverized drugs. Efflorescence also increases with pulverization, since the evaporation surface of the water of crystallization increases. With regard to solubility, as a drug is progressively pulverized, its dissolution rate increases. If there is microbial contamination, destruction or enzymatic changes in the powder composition may occur.

Packaging containers must have certain characteristics for each pharmaceutical form after pulverization, such as dark colored, as chemical changes can occur to the powders due to sunlight. In conclusion, the powders, as described, present certain differences in relation to the drugs that originated them, and each one depends on the type of pulverization that is applied on it.

Keywords: Pulverization; Powder; Drug

THE GENETICS OF CLASSICAL GALACTOSEMIA: A REVIEW AND POSSIBLE INTERVENTION

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Galactosemia is an autosomal recessive disease, where affected individuals are unable to metabolise galactose normally through the Leloir pathway enzymes: galactose mutarotase (GALM), galactokinase (GALK), galactose-1-phosphate-uridylyltransferase (GALT) e UDP-galactose-4-epimerase (GALE).

Classic galactosemia (prevalence 1:40.000-1:60.000) is caused by homozygous mutated allele in the *GALT* gene in chromosome 9p13.3, leading to a diminished activity in GALT enzyme. There are over 300 known mutations, polymorphisms and variants, where missense substitutions are the most common. Three variants of classic galactosemia are described (classical variant, clinical variant, and biochemical variant) with varying degrees of severity.

The classical variant, most prevalent in caucasian populations, is c.563A-G, being the most severe with a GALT activity <1%. Clinical variant c.404C-T is associated with a GALT activity between 1-10%, being most prevalent in Africa, where homozygous individuals have good prognostic if treated since infancy. Biochemical variant (or Duarte-D2) (c.[940A-G; -119delGTCA]) is associated with GALT activity between 15 - 35% and it is the least severe of the three.

Recommended nutritional intervention is immediate galactose restriction (including-breastfeeding) for any new-born "screen-positive" for galactosemia, avoiding potentially fatal complications. However, since galactose is produced endogenously, long term complications are unavoidable.

Even though it is a rare disease, galactosemia can have a severe impact on the life of affected individuals and their tutors. Nutritionists have a key role in managing the disease, particularly in the new-born first days of life, where an immediate galactose restriction is paramount.

The purpose of this literature review is to describe galactosemia, particularly classic galactosemia (OMIM #230400), from a genetic point of view and present a possible intervention.

Keywords: Galactosemia, genetics, nutritional intervention, rare disease.

THE INFLUENCE OF THE DIET IN MEDIUM-CHAIN ACYL-COA DEHYDROGENASE DEFICIENCY

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Medium-chain acyl-CoA dehydrogenase deficiency (MCADD) is an autosomal recessive disorder of mitochondrial beta oxidation of medium chain length fatty acids. It is caused by mutations in the *ACADM* gene and it's the most common disorder of fatty acid β -oxidation and one of the most common inborn errors of metabolism.

Most children are diagnosed through newborn screening using "octanoylcarnitine" (C8) as the metabolic marker. The 985A.G (K329E) mutation accounts for the majority of disease alleles, and approximately 47%–80% of MCAD patients are homozygotes for this mutation.

Children appear normal at birth and – if not identified through screening – typically present between age three and 24 months, although presentation even as late as adulthood is possible. Clinical symptoms include hypoketotic hypoglycemia and vomiting that may progress to lethargy, seizures, and coma.

Patients with MCADD are at risk during periods of fasting stress, particularly during intercurrent infections, of developing an encephalopathy associated with hypoketotic hypoglycemia. These episodes can be prevented by giving high calorie drinks during periods of illness, but hospital admission is required for intravenous dextrose if the emergency regimen is not tolerated.

For individuals with this condition, having a regular diet and taking carnitine supplements can help prevent them from experiencing life-threatening episodes.

Objective: With this research, we aimed to understand the recessive disorder MCADD and its genetic mechanisms and how as nutritionists we can act on helping those living with the disease.

Keywords: "Medium Chain Acyl CoA Dehydrogenase Deficiency", "Nutrition" and "Genetics"

GAUCHER DISEASE AND ASSOCIATED THERAPY

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Gaucher disease is the most common lysosomal storage disease, corresponding to a rare genetic disease with autosomal recessive transmission, caused by mutations in the *GBA1* gene, located on chromosome 1, encoding the catabolic enzyme β -glucocerebrosidase, leading to an accumulation of its substrate in many tissues. The locations of these recombination events are variable, ranging from intron 2 to exon 11.

Gaucher's disease is characterized by cellular dysfunction and clinical anomalies, such as organ augmentum. This is divided into three types, based on the presence and progression of neurological manifestations: non-neuropathic (type 1), acute neuropathic (type 2) and chronic neuropathic (type 3). Each type exhibits broad phenotypic and genotypic heterogeneity.

Possible treatments for this hereditary pathology are enzyme replacement therapy (ERT) and substrate reduction therapy (RTS), in order to attenuate bone symptoms. At the nutritional level, changing eating habits can help control symptoms derived from therapy and disease. Although there are no specific dietary guidelines for patients with Gaucher disease, it is important to monitor the nutritional and metabolic status of these patients for the purpose of create an appropriate dietary plan that meets the specific needs of each patient.

However, evaluating the efficacy of nutritional therapy is complicated by the possible effects of lifestyle and ERT or RTS on metabolic factors, which have not been fully elucidated.

The aim of this review was to describe Gaucher's disease at the genetic level and to address the possible nutritional intervention in it.

Keywords: Gaucher disease, Lysosomal storage disease, Genetics, Nutritional therapy

ORNITHINE TRANSCARBAMYLASE DEFICIENCY: GENETIC BACKGROUND

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Ornithine Transcarbamylase Deficiency (OTC) is a genetic hereditary disease that affects the urea cycle in the liver, which is responsible for the ammonia excretion, a toxic subproducts from the protein degradation in the form of urea through the urine. The OTC deficiency leads to the accumulation of ammonia in the organism which causes an intoxication and may lead to death. Since 2021 it is estimated that the incidence of the disease is 1:140000, and is more frequente in men, because the genetic background of the disease is connected with the X chromosome. Heterozygous females may also be symptomatic, but in many cases, either they have no symptoms or they develop hyperammonemia in situations of important catabolic stress such as severe infections, delivery or surgery. This phenotypic variability in female carriers appears to depend on the pattern of X-chromosome inactivation in hepatocytes and the severity of the mutation.

There are many mutations related to the appearance of OTC, most of them are amino acid replacement, followed by RNA splicing defects, premature protein terminations and deletions. Besides that, many sequence variations in the *OTC* gene result in more than one missense mutation of the same codon.

Even though there is no other cure other than a liver transplant, it is extremely important that the patient follows an hypoprotein diet supplemented with a mixture of amino acid and missing nutrients in order to promote tissue formation, organism normal function and to prevent malnutrition.

The aim of this work is to understand the genetic background of OTC.

Keywords: "Ornithine Transcarbamylase"; "Deficiency"; "Mutation"

THE GENETIC BASIS OF HEREDITARY FRUCTOSE INTOLERANCE

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Hereditary fructose intolerance is an autosomal recessive disease, potentially lethal, with an estimated prevalence of 1:20000 in Europe and with a carrier frequency of about 1: 70. It's caused by mutation of the *aldolase B* gene, the main enzyme responsible for the hepatic metabolism of dietary fructose. This disease can result from several mutations in the *aldolase B* gene, situated in chromosome 9q22.3, most of which are point mutations resulting on single amino acid changes that decrease stability or catalytic activity. One particular mutation seems to predominate in many of the populations studied, G→C transversion, resulting in the substitution of proline for alanine at position 149 in the protein, called A149P variant of aldolase B.

Subsequently, this will lead to losses in thermal stability, quaternary structure, and activity. X-ray crystallography is used to reveal the structural basis of these perturbations. Deficiency of aldolase-B thus, results in a potentially severe metabolic condition in which ingestion of certain sugars leads to cellular toxicity, illustrating the profound consequences that single-residue mutations can have on enzyme function. Nutritional therapy should include exclusion of fructose, sucrose, and sorbitol from the diet, this includes avoiding all types of food in which these components are found, either naturally or added during processing. Supplementation of vitamin C and folate may also be recommended.

Objectives: Understanding the genetic changes/mutations that underlie the hereditary fructose intolerance and help explain the phenotypes of affected individuals.

Keywords: hereditary fructose intolerance, aldolase B, genetic

THE EFFECT OF GENETICS ON PYRUVATE DEHYDROGENASE COMPLEX (PDC)

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The pyruvate dehydrogenase complex is composed by three enzymes that participate in the reduction of pyruvate to acetyl coenzyme A. Primary deficiency of the pyruvate dehydrogenase complex is a mitochondrial disease related to carbohydrate oxidation that primarily affects the brain and leads to decreased ATP production and energy deficit. PDC deficiency most commonly manifests as a syndrome of neurological signs and metabolic abnormalities. The most common cause is mutation of the *PDHA1* gene (Xp22.1), which encodes the alpha-E1 subunit. Mutations in the genes for the other subunits have been described, but less frequently: genes for the beta-E1 and E2 subunits - *PDHB*, *DLAT*; E3 binding protein gene - *PDHX*; *E3-DLD* and *PDH phosphatase-PDP1*. Depending on the affected genes it either can be an autosomal recessive or a X chromosome dominant pathology. It is important to try therapy in all patients with this pathology in order to mitigate the possible negative effects. This therapy involves a ketogenic diet based on a higher intake of fats and a decrease in carbohydrates as well as thiamine/vitamin B1 supplementation.

The identification of causing the mutations together with the functional and structural characterization of the respective protein variants, provides information on the severity of the clinical phenotype and selection of the most appropriate therapy namely the choice of a ketogenic diet.

Objective: Describe the pyruvate dehydrogenase complex deficiency in its genetic aspect and present a possible nutritional intervention for this pathology.

Keywords: "PDCD" "Genetics" "Deficiency in the pyruvate dehydrogenase complex"

"PRIMARY CARNITINE DEFICIENCY GENETIC FACTORS AND DIETETIC INTERVENTION"

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Primary Carnitine Deficiency (PCD) is a metabolic disorder of mitochondrial β -oxidation of fatty acids, with autosomal recessive transmission. This pathology is characterized by a low blood and intracellular concentration of carnitine and is caused by homozygous or compound heterozygous mutation in the *SLC22A5* gene on chromosome 5q31. The incidence of PCD in the general population is approximately 1/100,000 newborns.

The deficiency of this transporter at the renal level affects the reabsorption of carnitine, leading to its massive excretion in the urine and consequent intracellular depletion. In the absence of high intracellular levels of carnitine essential for the transport of long-chain fatty acids (LCFA) into the mitochondria, the mitochondrial β -oxidation of fatty acids, which is one of the main ways our body obtains energy, is compromised.

The carnitine palmitoyltransferase II (CPTII) deficiency is the most frequent muscular inherited disorder of the muscle fatty acid metabolism resulting in reduced LCFA oxidation as an energy source, both at rest and during muscular activities. Despite these premises, it's possible that a specific type of training, based on short duration contractions and resistance exercises, can be beneficial also for CPTII deficient patients, since energy sources used during exercise strictly depend on the duration and percentage of the maximal sustainable load.

The treatment essentially consists of the administration of carnitine, besides involving a daily dietary restriction of fats and increased carbohydrate intake.

The goal is to analyze what genetic factors can cause carnitine deficiency and what type of dietetic intervention can help.

Keywords: carnitine, carnitine transporter, carnitine palmitoyltransferase, genetics, nutrition.

HEREDITARY TYPE 1 GLICOGENOSIS

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Glycogenosis type I, or von Gierke disease, is an autosomal recessive genetic disease characterized by a deficiency of the enzyme responsible for the degradation of stored glycogen, G6Pase (glucose-6-phosphatase). Thus, the body is unable to use glycogen reserves for energy during periods of fasting, leading to an accumulation of glycogen, especially in the liver. This disease can be subdivided into two subtypes: Glycogenosis Ia (GSD-Ia) and Glycogenosis Ib (GSD-Ib).

Type I glycogenosis can cause visually evident changes in the body (lumps in the abdomen, tremors, hyperventilation, cyanosis, apnoea, convulsions, pallor, sweating, edema/ cerebral dysfunction, swollen face with large cheeks and diarrhea).

The human gene expressing G6Pase (*G6PC*) has been located in chromosome 17 at 17q21, with 12.5 kb, and includes 5 exons and genetic information for synthesis of a protein with 357 amino acids. More than 85 different mutations have been found in patients with glycogenosis type I.

GSDI is inherited in an autosomal recessive manner. Carrier test, prenatal testing for an increased risk pregnancy, and pre-implantation genetic testing are possible if both pathogenic variants have been identified in an affected family member.

Nutritional therapy is focused on reducing periods of hypoglycemia as much as possible, using raw corn starch or glucose administration via nasogastric tube. In the most severe cases, a liver transplant may be necessary. There is no specific drug for this treatment, as it will change according to other associated pathologies.

Objectives: Understand how the genes of the parents are reflected in those of their descendants, thus understanding heredity in von Gierke's disease.

Keywords: "type 1 glycogen storage disease"," glycogenosis type 1"," gene type 1 glycogen"

GREEN JOBS

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Jobs in agriculture, manufacturing, research and development, administration, and service activities contribute considerably to preserving or restoring the quality of the environment. Green jobs reduce the environmental impact of companies and economic sectors to levels that are at least sustainable, i.e., protect ecosystems and biodiversity

To be green jobs, they need to meet decent work requirements, including aspects of child labor, occupational health and safety, social protection, and freedom of association.

Our main objective is to understand the issue of green jobs. As a more specific objective we intend to know the relationship of the three pillars of green jobs, the preservation of the environment, decent jobs, and the mitigation of climate change.

The conception of this work went through the analysis of several platforms such as Iberdrola, United Nations and Google Scholar, as well as some scientific articles related to the subject under study.

The Green Economy, a direct consequence of green jobs, has risen about 4% every year worldwide. Green jobs rose about 20% during the European recession between 2002 and 2011, and in the following two years between 2012 and 2013 it rose, in Portugal, by 7.3%.

We conclude that green jobs are a current theme with increasing importance, due to the need to adapt to the circumstances of the modern world, such as climate change, overpopulation and lack of resources, as well as the fulfillment of human rights and the preservation of the well-being of the entire population.

Keywords: Green Jobs, Environmental Impact, Occupational Health

WOMEN AND SAFETY AND HEALTH AT WORK

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According to the DGS, Occupational Health is “an area of intervention that values the workplace as a privileged space for the protection of occupational risks, the protection and promotion of health and the access of workers to Health and Safety Services at work.”

Man and women present differences from a biological point of view, and although all the efforts that have been developed do lessen the differences between genders, the activities they perform, the working conditions, the salaries, and the way they are treated, continues to be different between both genders.

Therefore, this work is able to perceive the differences that can affect the safety and health at work of the different activities, in function of the gender and the inequalities in the questions of health and safety. And also, teach measures to reduce gender differences in safety and health at work.

Keywords: SST, occupational risks, gender differences

PSYCHOSOCIAL RISKS AND STRESS AT WORK

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Currently, work-related psychosocial risks are a challenge in Occupational Health and Safety and are associated with problems such as stress, violence, harassment and intimidation. A healthy workplace is one where members of the organization collaborate to protect and promote workers' health, safety and well-being.

We aim to understand how the workplace affects the health of workers.

After a bibliographic review, we chose to use the report "The Cost of Stress and Psychological Health Problems at Work, in Portugal", published by the Ordem dos Psicólogos Portugueses as a basis.

In the report, it appears that stress and psychological health problems at work not only have a huge human cost, but also an impact on society and the economy. The promotion of Psychological Health in Portuguese companies can reduce productivity losses by up to 30%.

Research shows other adverse effects of Stress and Psychological Health problems, namely, the increase in accidents due to human error, as well as the increase in labor conflicts and the intention to leave the organization. It is also verified that high work demands increase the probability of diagnosis of a physical illness and that long working hours increase mortality. Depression is a risk factor for physical illness-related causes of death.

In short, health promotion by companies can reduce the risk of mortality and increase the productivity of workers.

Keywords: psychosocial risks, stress, workplace, health promotion.

NANOMATERIALS

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Nanomaterials are materials that have structural grades on the order of 10^{-9} m (nanometer), they are a recent and appealing area of research and the modification of properties by downscaling allows the production of components with reduced dimensions and properties distinct from those exhibited by conventional materials. They can occur naturally or be produced by human activity. Nanotechnology is science, engineering and technology translated to a nanoscale. They can have a top-down approach, relates to the process of "degrading" a block of material to the desired shape (e.g. processors), or have a bottom-up approach, i.e. building the materials atom by atom (e.g. quantum dots). In addition it can be dry nanotechnology, which is used to manufacture structures in carbon, silicon, inorganic materials, metals and semiconductors, and wet nanotechnology, which is based on biological systems present in an aqueous environment. In this branch we can include electronics, energy, biomedicine, environment, food, and textiles.

We can find advantages, namely in the benefit of renewable energy, reducing the cost of solar panels; application of the branch of electricity and the effectiveness of medicine, relating to the modification of damaged genes.

On the other hand, we find disadvantages in the use of this technology, such as: the threat to the environment, due to the toxins released into the atmosphere; the impact on the job market and can compromise security, due to the ease of spying on properties.

In short, this theme is very interesting for technological advancement and, consequently, for global growth, which can be indirectly linked to the occupational health of society.

Keywords: Materials, nanotechnology, advantages, disadvantages, benefits

MUSCULOSKELETAL INJURIES

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Occupational Health is, according to the definition of the Directorate-General for Health (DGS), "an area of intervention that values the workplace as a privileged space for the prevention of occupational risks, the protection and promotion of health and workers' access to Health and Safety Services at work."

With this work, through a bibliographical research, it was intended to make known the musculoskeletal lesions, symptoms and how to prevent this type of disease. Therefore, musculoskeletal injuries (MSDs) are one of the most common work-related diseases, are cumulative and motivated by repetitive efforts over an extended period of time, however and due to work accidents may also have the form of acute traumas such as fractures. In this way, it is important for everyone to participate in combating them. The preventive part is of high value for a Security Technician, as this aims to prevent the onset of these and other diseases and thus, be part of the medical team of the work or by doing training actions.

The practice of work gymnastics helps not only to combat, but also to prevent, among other diseases, musculoskeletal injuries, increasing productivity and worker satisfaction. The exercises of work gymnastics, try to exercise the parts of the body where the lesions are more frequent, and can be practiced daily.

Keywords: Health, Musculoskeletal Injuries, Diseases, Prevention, Combat

INTEGRATION OF SAFETY AND HEALTH WORK INTO EDUCATION

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Safety and Health at Work corresponds to a set of rules that aim to prevent occupational risks and protect and promote worker health.

This work aimed to inform and sensitize the population belonging to education about Safety and Health at Work.

To develop this work, we resorted to the research of scientific articles.

Young people have revealed a greater tendency to unconsciously expose themselves to risks, and a greater predisposition to unsafe acts, most often due to the desire to take on challenges, but also due to the need to present skills to the employer or co-workers, mainly in order not to lose their jobs.

Portugal is one of the countries with the highest number of accidents at work, and young workers are one of the most susceptible groups to suffer these accidents. This situation has been related to lack of experience, unawareness about risks and propensity for unsafe acts on the part of these workers.

Students and staff collaborate to make the school a safe and healthy place to work and learn through: risk education and Safety and Health at Work management, health promotion and education using initiatives to create healthy schools, promotion of dignity and respect for all, such as anti-bullying campaigns, and care for the environment, e.g. reuse and waste management (European Agency for Safety and Health at Work).

Thus, it is essential to prepare workers before they enter the labor market, avoiding unsafe behavior and, consequently, reducing the number of work accidents.

Keywords: Education, Health, Safety, Work, Youth

COSTS ASSOCIATED WITH A PATIENT IN THE HOSPITAL PHARMACY

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The complete determination of hospital costs is difficult and complex, associated with the different products used and the level of care and activities provided. One of the areas that has the most associated costs is the area of oncological diseases.

The main objective of this work is to identify and analyze some direct costs of colon cancer treatment in the Algarve region.

A bibliographical search was carried out in different databases including "SNS" and "INFARMED", using keywords such as "hospital costs", "colon cancer costs", "colon cancer", "costs of a patient", articles of the last ten years on the subject are chosen.

In the context of the public hospital there is a patient classification system that makes it possible to assess the performance of a hospital in relation to the level of a hospital in relation to the level of resource consumption. In Portugal the costs of a patient in the first quarter of 2022 was on average 421 euro. The estimated annual cost of cancer treatment in Portugal is 867 million euro. Medications, hospitalization and outpatient care are the most significant cost components.

Colorectal cancer is the third leading cause of cancer death in both sexes and its average cost is EUR 15,592.43 in the first year and in the following three years it is EUR 24,518.15.

With the development of cancer treatments, including new drugs and biological agents, are expected to increase direct costs to the health system.

Keywords: "hospital costs", "colon cancer costs", "colon cancer", "costs of a patient"

BIOLOGICAL VS BIOSIMILAR THERAPEUTICS

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Introduction: A biological therapy is based on macromolecular pharmaceuticals, such as peptides, enzymes, antibodies, synthetic proteins, vaccines, and gene therapies. They are manufactured through biological processes rather than chemical synthesis. The chemical structure of biologicals provides greater pharmacodynamic specificity and therapeutic efficacy. They present advantages that are being used for research and development of new biological products in the treatment of cancer and diabetes.

Biosimilars are biological products that are similar to an approved biological medicine, and that don't present significant clinical differences from the reference product in terms of safety, purity and potency. Usually they are more affordable than the reference products.

Objective: Describe the differences and similarities between biological and biosimilar medicines.

Methods: Analysis of selected articles searched in proven scientific bases such as Pubmed and ScienceDirect.

Results: Given the high therapeutic potential, biological drugs are used in the treatment of various types of cancer. However, the high cost of biological medicines limits access to these treatments, which constitutes a public health problem. Some examples of biosimilar medicines for the treatment of cancer are epoetin (α , β), filgrastim and monoclonal antibodies such as rituximab.

Conclusion: With the decline of patents for biological medicines, there has been an increase in the production of biosimilar medicines, these have great economic advantages, because to enter the commercial market they only need to prove efficacy, quality and safety in relation to the reference biological medicine, as well as therapeutic advantages. Some adverse effects caused by the reference drug can be avoided.

Keywords: "therapies", "biosimilars", "biologicals", "drugs", "cancer"

HOSPITAL DRUG DISTRIBUTION SYSTEMS

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The hospitals have been automated with 3 dispensing systems, carousel dispensing technology (CDT) and unit dose systems combined with automated dispensing cabinets and prescription entry, reducing errors.

The objective of this paper is to identify automatic and semi-automatic drug delivery systems in hospitals.

To collect information, a search was conducted in electronic databases (pubmed and google scholar), with "hospital drug distribution systems" as the key words used.

There are centralized dispensing methods, with CDT and robotic systems that deliver medications to inpatients; decentralized, with systems that assist nurses; and hybrids, combining these resources.

In 27 of the 30 case studies, automation increased patient safety.

In a centralized system the wrong medication can be selected. The hybrid system did not reduce medication prescription errors. In decentralized systems, 6 out of 19 studies showed a 27% reduction in adverse effects and administration errors.

Distribution and storage errors have been reduced, but not errors that occur before, and patient records should be computerized and order entries checked.

Centralized systems created an additional burden for pharmacy technicians and decentralized ones improved the productivity of pharmacists and nurses.

In centralized systems stock costs are reduced, in decentralized systems costs are easier to control, and in hybrids there is better use of human resources.

Automation has facilitated distributive responsibilities for pharmacists and freed up technicians for other tasks.

The hospital pharmacy continues to be responsible for the preparation and distribution of medicines with improved safety and efficiency.

Keywords: hospital drug distribution systems

ORGANIZATION IN THE HOSPITAL PHARMACY

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Pharmaceutical services are an important healthcare structure provided in hospitals.

The hospital pharmacy is responsible for managing the rational and safe use of medicines.

Stock management, drug dispensing, pharmacotechnics, pharmacy and therapeutics committee, and pharmacovigilance are organizational parameters that are important to ensure risk management.

The objective of this paper is to describe the various parameters associated with the organization of the hospital pharmacy that aims at maximum profitability.

We collected information from Google Scholar, OpenAire Explore. Using the keywords: organization, pharmacy, hospital, Portugal.

In stock management, a supply parameter, the technical responsibility for the supply of pharmaceutical products and drugs in quantity and quality with the lowest possible cost and correct conservation must be fulfilled.

The acquisition must be continuous, in order to ensure the pharmacotherapeutic needs of the institution in question.

Storage of pharmaceutical products and medical devices must guarantee their necessary conditions. They're organized alphabetically according to the "first in first out" storage order.

Distribution makes the correct medication available, promoting safeness, effectiveness, and rational use of the prescribed medication for any patient.

Pharmacotechnology, has as its main goal to produce effective and safe pharmaceutical preparations for all patients.

Those involved in the preparation of these products must ensure standards of hygiene and cleanliness, maintaining high and reporting any health problems.

Concluding, the Hospital Pharmacy is divided in sectors, where pharmacovigilance is indispensable because helps to detect, evaluate and prevent adverse reactions or other problems related to the marketed drug, satisfying the hospital services needs and improving the quality of the patient's life.

Keywords: Organization, Pharmacy, Hospital, Portugal

MEDICATION ERROS

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Introduction: Health professionals are a key element in the medication circuit. Health communication and proximity to the user are essential to avoid medication errors.

According to the EMA (2015), medication error is “an unintended failure in the drug treatment process that leads to, or has the potential to lead to, harm to the patient. Mistakes in the prescribing, dispensing, storing, preparation and administration of a medicine are the most common preventable cause of undesired adverse events in medication practice and present a major public health burden”.

Objective: It is intended to identify the most prevalent errors, the main causes and possible solutions to prevent and/or reduce their incidence.

Methods: A search was conducted using Pubmed, EMA, Infarmed and Google Scholar. In this search, the keywords "medication error" and "error prevention" were used. Articles between 2020 and 2022, written in English and Portuguese, were restricted.

Results: In Portugal, 11% of the reported notifications are medication errors. According to WHO (2015), 8% to 10% incur in intensive care and about 13% in outpatient settings. The most common medication errors are associated with drug administration, prescription, omission and postponement of medication, and wrong dosages.

Conclusion: Among the solutions for reduction and/or prevention, the importance of a standardised electronic tool to make the medication reconciliation process easier, safer and more productive stands out. In this sense, it would allow to increase the quality of the transition of care (hospital - ambulatory), resulting in the improvement of the patient's health, increasing the quality of life.

Keywords: Medication Errors; Health Communication; Therapeutic Reconciliation

ECONOMIC MANAGEMENT OF DRUGS STOCKS AT HOSPITAL PHARMACY

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Introduction: About 50% of all medicines are prescribed, dispensed or sold inappropriately, while, 50% of patients don't take their medicines correctly and about 1/3 of the world's population lacks access to essential medicines.

Objective: The objective of this work is to identify the procedures used for the rational use of medicines in the hospital environment, as well as to understand the reason that leads to a continuous expenditure of medicines at the hospital level.

Methods: The literature search was conducted in different databases including "PubMed", "ScienceDirect", using the keywords such as "Economic Management", "Medicines", "Stocks" and "Hospital Pharmacy", and the articles from the last seven years on the subject were chosen.

Results: According to the WHO, medicines are the second largest cause of expenditure in the Health System in each country, and for this, it was necessary to implement several "tools" that allow recording the inventory of the hospital pharmacy, as well as calculating the annual expenditure, such as the ABC tool.

The ABC tool is based on the monetary value and the consumption rate of the items, which will help to closely monitor the greatest benefits in terms of cost reduction, as well as always maintaining a continuous and uninterrupted stock. These items can be classified into Category A, B or C according to their consumption. About 20% of the items account for 70-80% of consumption (Category A), the 15-25% of the items account for 16-20% of consumption (Category B), and the 60-75% of the items account for 5-10% of consumption (Category C).

Conclusion: In conclusion, an efficient economic management of drug stocks translates into a significant decrease in costs in this sector, since it allows greater control over the dispensing of drugs in a more rational and precise manner.

Keywords: "Economic Management", "Medicines", "Stocks" and "Hospital Pharmacy"

THE HOSPITAL PHARMACY TRENDS

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Introduction: The term Good Manufacturing Practice (GMP) is commonly used to refer to manufacturing practices applicable to the food, pharmaceutical, cosmetic, medical device, blood bank, etc. industries that are designed to ensure the quality of products marketed in a particular country or region. Specifically in hospital pharmacy, the application of GMP in drug preparation is of high importance to minimize the risks of particulate and pyrogen contamination.

Objective: Describe the process of sterilization using Ethylene Oxide (EO) in a hospital setting.

Results: In practice, the manufacturing process is controlled by implementing numerous tasks to document compliance with all parameters involved, such as: operator training and validation; qualification and monitoring of the facility and equipment; qualification and control over raw material and consumables; validation of the process and QC methods; inspection by competent authorities.

EO is a well-known sterilizing agent, being one of the methods of choice for thermosensitive medical products. Currently its use has increased due to its application in the field of new medical device development and sterilization. It is considered the most economical and sterilization process available at lower temperatures with good reliability results.

EO is especially used because of its bactericidal, sporicidal and virucidal capacity.

Conclusion: OE has allowed the sterilization of diverse material such as some medical devices, which otherwise would not be available. For sensitive materials OE is the only acceptable sterilization method. However, some difficulties had to be overcome related to potential hazards to patients, staff and the environment, in addition to the risks associated with being a flammable gas.

Keywords: GMP (Good Manufacturing Practice); Hospital; Sterilization; OE (Ethylene Oxide)

BACTERIAL DISEASES

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Over time we can see new diseases appearing, giving rise to serious epidemics situations which sometimes affect the world's population, known as pandemics.

Bacterial diseases are an example of the diseases that most affect the population worldwide, the most common being Botulism, Chlamydia and Cholera.

Therefore, we classify bacterial diseases as infectious diseases caused by bacteria, which are identified as single-celled procariont organisms that are found in the environment and can lodge in both humans and animals.

Epidemiology acts on these diseases by monitoring demographic and population factors, from prevention, to neutralisation of risk factors under the population groups most susceptible to these types of diseases.

In this work we aim to present some bacterial diseases, more specifically Legionella, Tuberculosis and Tetanus, relating them with epidemiology and presenting the forms of prevention of these diseases.

In short, in the field of epidemiology, an environmental health technician's purpose is the control and prevention of the spread of diseases caused by bacterial agents in the population.

Keywords: bacterial diseases, epidemiology, Legionella, Tuberculosis, Tetanus

EPIDEMIOLOGICAL RESEARCH IMPORTANCE

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In order to study the importance of epidemiological research, it is essential to get a better understanding of what epidemiology is.

Epidemiology is the branch of medicine which deals with the incidence, distribution, and possible control of diseases and other factors relating to health.

This science was created in ancient Greece and since then has been suffering from major changes. One of the great revolutions that occurred in epidemiology was in the 19th century with the study of the cholera, studied by John Snow.

Epidemiology is a science that studies collective diseases (epidemics) with the most recent example of the covid-19.

This science aims to evaluate the risks and damages associated with the disease, trying to obtain a cure for it. It is also important to recognize the areas that epidemiology covers, such as clinical epidemiology, investigative epidemiology, nutritional epidemiology, among others.

After that, it is possible to analyze the importance of epidemiological investigation.

Is epidemiological research important?

Epidemiological research has a very important role nowadays because it's this area of research that makes it possible to promote public health, helping the population to have greater security in relation to health and allowing people to have a better quality of life.

So, with these facts in mind, it's possible to conclude that epidemiological research is significant to our society and that without it the world would certainly be a very different place.

This work aims to demonstrate the importance of the epidemiological investigation and its impact on our daily lives.

Keywords: health, investigation, sickness

HISTORY AND FUNDAMENTALS OF EPIDEMIOLOGY

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Introduction:

Epidemiology is the science that studies the distribution of health/disease states and their determinants in human populations.

Until the substantiation of the study, the transmission method of cholera disease was unknown.

In 1849 John Snow made public that contaminated water was the cause of cholera outbreaks, but he was not credible.

At that time, London was the most populous city in the world and no care was taken with the treatment of waste and water, which led to the proliferation of the cholera epidemic in August of the same year.

Death rates reached 12.8% in some regions (Soho urbanization).

Snow, convinced of the theory he had published, did field work where he proved that the "well" was the cause of the outbreak.

Thus, he was able to get the authorities to shut it down, preventing the disease from spreading further.

Later, it was discovered that the cause of the epidemic had been a sick baby's diaper.

Conclusion: Scientifically, Snow's studies were the origin of modern epidemiology, that is, the analysis of the evolution of a disease in a population in order to discover how it can spread, and this is how Snow becomes known as the father of modern epidemiology .

Keywords: Epidemiology, cholera and epidemic

HOW EPIDEMIOLOGY CONTRIBUTES TO PANDEMIC RESEARCH

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Introduction: This paper, entitled "To what extent epidemiology contributes to pandemic research", was requested within the epidemiology curricular unit of the Environmental Health Degree of the Coimbra School of Health Technology. The term epidemic is used to characterize situations in which the occurrence of a disease with an infectious and transmissible profile is recorded in a given region, with rapid and important dispersion and involvement of a large number of people. So it is necessary to consider an elevation of a number of cases in a given location for a generally short time, this would characterize an out-of-the-way pattern.

Goal: The main objective is to understand how epidemiology contributes to the investigation of pandemics.

Methodology: For the elaboration of this work, we used the research (of news), web sites, which aroused our attention and addressed the theme in question, efficiently and reliably.

Results: In the field of health promotion, epidemiology plays an important role in worrying not only with the control of diseases and their vectors, but, above all, with improving the health of the population.

Conclusion: We conclude that thus, the main objective was to understand how epidemiology contributes to the investigation of pandemics and without it it would be impossible to perceive the distribution of a disease or psychological state in populations and the factors that influence this distribution.

Keywords: Epidemiology, Research and Pandemics

PATHOLOGICAL CLASSIFICATIONS

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Epidemiology has several branches in which it studies the distribution, frequency/occurrence and health determinants in populations. In these branches which are also based on the disease, and all its classifications, include pathological classifications, in other words, it's when the disease is already associated with specific symptoms.

The disease is characterized as a change in health status such as an infection, or pathological manifestation. Pathology studies these changes in the structures of functions, in the biochemistry of cells, tissues and organs. This ends up explaining the mechanism and cause of the occurrence of a certain pathological manifestation.

There are different types of pathological classifications of diseases, as well as: addictions (alcohol, drugs, medication, gambling, etc); nutritional disorders (bulimia, anorexia, binge eating disorder, etc); congenital anomalies (Down syndrome, sickle cell anemia, etc); allergies (dust, mites, food, medication, etc); mental illness (depression, anxiety, schizophrenia, etc).

One of the diseases that we refer more specifically and one that stands out the most in now a days is anxiety, which is considered a mental illness that is increasingly talked about in our daily lives, as there are more and more people who have this same disease, largely in the youth sector. Anxiety becomes pathological when it begins to harm daily life, thus causing physical and emotional disorders.

In the end, we aim to identify Pathological Classifications and their connection with Epidemiology, as well as several other factors, due to the fact that this scientific discipline focuses on the determinants of health in populations.

Keywords: Disease, pathological classifications, pathology, factors, agents.

THE IMPORTANCE OF THE EPIDEMIOLOGIC RESEARCH IN THE STUDY OF THE MORBIDITY OF POPULATION

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With this study we pretend to reinforce the importance of preventing diseases in a way to avoid their rapid evolution and propagation. This study is done with the purpose to determine factors that condition certain diseases.

The morbidity is the rate of carriers of a given disease in relation to the total population studied, in a given place at a given time. The epidemiological control serves for health and intervention can act in prevention and help to control the disease so that there is no evolution of itself. The quantification of diseases or the calculation of the morbidity rate are important tasks for epidemiological surveillance.

Epidemiological research is very important for the control of diseases and to determine their conditioning and determining factors in human populations. It is a field work that has been extensively carried out based on cases of incident factors and their last contacts, whose main goals are:

a) Identify the main resource of transmission of the infection and the ways of its propagation; b) Identify the exposed groups that have the most risk of infection and their factors; c) Confirm the diagnoses and discover the main epidemiologic characteristics; d) Guide control measures to prevent the propagation of new cases.

In conclusion, if it hadn't been discovered determining factors of diseases, (such as Cancer, Alzheimer's, Cerebral vascular accident, suicide, atherosclerosis, and many other diseases...) we weren't able to control them and they would probably affect many more people, which is why examinations are carried out regularly in order to prevent the evolution of certain diseases and help in their prevention.

Keywords: Epidemiology, diseases, research,

HEALTHCARE-ASSOCIATED INFECTIONS – HAND HYGIENE

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Healthcare-Associated Infection (HAI) is a localized or systemic infection resulting from an adverse reaction to the presence of an infectious agent or your toxin. The most common vehicle for microorganism transmission varies according to the type of contact between health professionals, the patient and the environment, and the main form of prevention is hand hygiene. This study aimed to evaluate the knowledge and good practices of health professionals regarding this issue. For its elaboration, a literature review was performed, and a questionnaire was applied to health professionals from two Hospital Units, in order to compare them.

All respondents in both Hospital Units considered hand hygiene important, but 29% in Unit A and 18% in Unit B didn't know the complete definition. Hand hygiene is a habit that's difficult to change. Most health professionals wash their hands as needed, failing to do it truly in the "5 moments" recommended by the WHO.

Through the questionnaires, we conclude that there should be an improvement in certain parameters, both in terms of knowledge and practice. We can also highlight that, the nurse answered more correctly in most of the questions, but in relation to bad practices, they were the professional category that stood out the most. We also have Unit B with more positive results. More training should be implemented in order to increase the knowledge of health professionals regarding this practice.

Keywords: Healthcare-Associated Infection, Hand hygiene, "5 moments", Health professionals

GOOD HYGIENE AND HEALTH CARE PRACTICES IN A DAYCARE CENTER

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This study aims to assess how hygiene procedures are performed in a day care center, more specifically procedures related to hand hygiene, hygiene care of children, and hygiene of materials and equipment used in child care.

Hygiene is essential for the individual and collective health of children, whatever their living context, thus, the creation of this habit promotes and leads to the preservation of good hygiene, understood as "a set of means to achieve health balance" (Costa, 1995, cited by Esteves & Anastácio, s). The DGS (2015) mentions that hygiene is essential for health, well-being, quality of life, and social coexistence, being understood as a set of care measures that promote these same aspects, as well as improve individuals' self-esteem.

This study aimed to understand if hygiene care for children is being followed and if there is knowledge of it on the part of the employees.

A questionnaire was prepared and administered to the employees of the institution. This was a cross-sectional study.

The study pointed out that the employees of the daycare center understand the importance of hand washing and most have approximately 16 years of professional experience. They also emphasize understanding the importance of sanitizing the countertops, utensils as well as sanitizing the children.

Hand sanitation impacts not only health and nutrition, but education, economics, and equity, as stated by The Global Handwashing Partnership program.

Keywords: healty, hygiene and children

RISKS ASSOCIATED WITH HOSPITAL WASTE MANAGEMENT

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In the last few years, a significant effort has been made towards an adequate management of hospital waste, but in the absence of a clear understanding of the associated risks, there are often inadequate management practices. The present study work had as main objectives, to analyse the knowledge of students from different courses of ESTeSC concerning the knowledge about hospital waste management practices. To this purpose, we applied the same questionnaire to the different courses at the ESTeSC in order to understand the knowledge that the different students have in this health area. However, it should be noted that we did not obtain a large sample of answers from the respondents, thus lowering, in our opinion, the percentage of accuracy of the study regarding their knowledge on this subject. We have to make people more aware in order to prevent possible non-conformities, since we concluded that it is a subject that is little addressed and in which there is an associated risk both for public health and for the health and safety of workers due to possible contamination by poor application of the established internal rules or by ignorance and lack of information on the part of the population.

Keywords: Hospital Waste, Management, Risks, Prevention.

SALUBRITY AND CONSTRUCTION OF THE HABITATION

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Habitation is a space for construction and consolidation of health development, a healthy dwelling encompasses the artificial biophysical environment, built by man from nature, including the dwelling and the environment where it is located.

The construction of any dwelling must guarantee essential conditions of salubrity. Man has always felt the need to create a shelter to protect himself, in this sense, his techniques have always evolved and improved until what we know today as a house.

The state of health of a population can be related to the material and social conditions of the environment in which the population is inserted. It is the different ways in which society relates to nature that characterize the transformation of the environment, recreating a new environment.

This work aimed to understand and evaluate the Construction and Salubrity of Habitation, specifically the housing of higher education students.

To develop this work, we resorted to the research of scientific articles and a questionnaire applied to higher education students. From the questionnaire, we obtained 35 answers with the most important results, 62.9% of the respondents do not have access conditions for disabled people and humidity in the dwelling. 45.7% answered that there were drafts in the dwelling due to doors or windows not working properly. 74.3% mentioned that there was no fire extinguisher within the validity period in their dwelling. 25.9% of smokers smoke indoors. This can and should alert us to the basic health conditions.

Keywords: Salubrity, Construction, Habitation, Students

HABITAT MANAGEMENT IN THE CONTEXT OF CATERING AND DRINKING ESTABLISHMENTS

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With the diversities of the modern world, drinking and eating establishments have been undergoing changes in various aspects such as economic issues, safety, hygiene and well-being for both customers and employees.

These establishments require an operating licence, alvará, in accordance with the decrees of law. As future environmental health technicians, it is necessary to carry out a compulsory inspection in order to ensure that the space has healthy conditions, good habitat management and to guarantee food hygiene and safety.

Our main objective is to understand if the above-mentioned establishments comply with the norms established in the decrees of law.

To carry out this work, we inspected a restaurant in order to assess the conditions of the space and its good practices, with the aim of understanding whether the standards in force are being applied.

In general, the state of conservation, cleanliness and tidiness is positive and there is adequate packaging of products in the fridges and freezers with separation of raw food from cooked food. However, it was also possible to see some irregularities, such as, for example, the lack of access for disabled people, although there is a disabled access toilet, the entrance to the space is on stairs, which makes it impossible to enter.

With this study it was possible to conclude that in the space in question most of the laws are complied with, however there are irregularities and aspects that can be improved.

Keywords: Surveys, Catering, Habitat Management, Food Safety and Hygiene

GAME AND RECREATION SPACES

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A Play and Recreation Space is an area intended for children's playful activity, physically or functionally delimited, in which motor activity assumes special relevance. (Decree-Law nº379/97 of 27 December). It has a great importance in the functional and intellectual development of children as it helps in solving problems, helps to develop skills and gives them more autonomy and freedom. As such, it is essential that all spaces guarantee safety and favorable conditions, also from an Environmental Health perspective, to those who frequent them, complying with all the supposed rules in force.

This work aims to verify and expose the conditions and safety standards of two spaces for play and recreation (children's parks), and to conclude if they are in accordance with and comply with the norms presupposed by the Decrees-Law and consequently able to be properly attended by the population.

For the execution of this work, a technical file and a checklist were carried out properly organized in important sectors in the verification of the conditions of game and recreation spaces based on various legislations from Law Decrees and Ordinances. In this way, we went to the two places to carry out an inspection with the aim of verifying and comparing both spaces in the future.

Keywords: Children, Play space, recreation, safety, activity.

BUILDINGS AND REDUCED MOBILITY

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Currently, people with reduced mobility face daily challenges due to the inaccessibility of certain places. Observing the cities, we find obstacles for their displacement, such as irregular sidewalks, inclination of the streets, traffic lights with short time for crossing or access to public transport.

As an objective, we want to understand the difficulties that people with reduced mobility face daily due to the bad construction of infrastructure in Portugal, and also to investigate measures implemented to combat these difficulties.

After a literature review, we chose to base our study on a Master Dissertation on "Accessible Tourism - Case Study of the city of Coimbra".

After analyzing the results of the study, it was verified that in Coimbra we can find numerous obstacles to mobility. Regarding accessibility in accommodation, it was found a reduced offer of accessible rooms. Of the 1122 rooms available, only 19 are considered accessible and most have toilets with bathtub. In restaurants, we found that few restaurants have conditions to receive a person in a wheelchair, due to the lack of adapted sanitary installations. Regarding public transportation, we found that the SMTUC has adapted buses for people with reduced mobility equipped with access ramps, large interior spaces, reserved seats, audible and luminous announcements and Braille on the stop buttons.

Concluding, from the results of the study we found that the city of Coimbra still has much to evolve in order to facilitate the access of people with reduced mobility, who still find several obstacles in the city.

Keywords: reduced mobility; accessibility; buildings; displacement.

PEST CONTROL IN DWELLINGS

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The civil construction industry has been growing at a fast pace due to high population growth, constant urbanization, and technological advances. In this way the construction industry has become one of the most important activities for the country's economic and social growth. Planning defines guidelines and criteria for the quality of housing construction and for the environment, and is associated with regional development.

Dampness is a challenge for civil construction since poor waterproofing results in several pathologies that will be difficult to detect when the building is finished. Neglecting these problems will result in the early degradation of the building, the appearance of pests, and the consequent displacement of its inhabitants.

The importance of basic sanitation has a bearing on health, quality of life, and the development of society. Thus, if there is no sanitation in a certain place, the probability of the spread of diseases is high, as well as the existence of pests in these places and the surrounding areas.

Pest control can be done in several ways, starting with the planning and construction of a particular dwelling, and can prevent the appearance of pests. There are some types of pest control services such as insecticides, pesticides, special equipment, among others. There is a greater probability of these pests appearing in the construction phase of a house, because they have an acute sense of smell.

In short, there is an increasing need for prior monitoring of the entire project, i.e., care to be taken in construction, from the beginning of the project to its completion.

The methodology used in this work is based on the research of scientific articles and certified sites to retain qualified information.

The main objective focuses on pest control in housing construction projects.

Keywords: Pests, humidity, sanitation, housing, projects

NURSERIES AND KINDERGARTENS AND HABITAT MANAGEMENT

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A Nursery is defined as an institution in which children aged between 3 months and 3 years are concentrated. It is in these institutions that there are actions that influence the child's early learning, and also aim to stimulate the child's global development through various activities.

A Kindergarten, on the other hand, is an establishment intended for children between 3 and 6 years of age, that is, it is more focused on children about to enter basic education. It has some similarities with the nursery in terms of some activities: both are educational and family support means that provide educational and assistance care to the child and contribute to socialization, their global development, and the screening of inadaptations, deficiencies and precocity and for their emotional and affective balance.

The objective of this study is to verify the hygiene and salubrity conditions in these public spaces, as well as verify the fulfillment of the required legal requirements.

Therefore, with this work, we will have the perception of how a survey would be carried out, in the future, in our profession, if necessary, and with this, we will verify the objective of this study according to the spaces and situations in which they will be found.

Keywords: habitat; salubrity ; nursery; kindergarten; hygiene

Discipline: Habitat Management

Professor: Ana Catarina Lança, Susana Paixão

Degree: Environmental Health

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HABITAT MANAGEMENT IN NURSING HOMES

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As we age, we tend to have decreasing regenerative capacities, that lead us to greater vulnerability and predisposition to functional decline, taking this into account, physical and emotional changes also occur, that compromise our quality of life. One of the main problems associated with aging, that we are all aware of, is social isolation and the feeling of loneliness. It is a stage of life in which the elderly needs to feel valued, to live with dignity and with affection. This way, institutions that support the elderly, such as nursing homes, constitute a fundamental support in the provision of services to these people, ensuring essential care for a dignified life.

A nursing home is an establishment where social support activities are carried out for elderly people through collective accommodation, for temporary or permanent use.

This work aims to understand and evaluate the hygiene and safety conditions in nursing homes, giving special attention to the legal framework of the establishment, as well as the creation of a checklist based on the fundamental points of the legislation "Portaria n.º 67/2012".

Keywords: Nursing home, legislation, Checklist, quality of life

POVERTY ENERGY AND HEALTH

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Energy poverty is the inability to bear the costs of energy services that ensure the heating and cooling of houses, as well as heating water, cooking energy due to its high cost.

There is not only one indicator to identify energy poverty, but this can be observed through several components, including: Quality and energy efficiency of housing, infrastructure and equipment available, social practices, social standards and aspirations, efficiency of household equipment, income of citizens, energy prices and finally the confidence of citizens in institutions and suppliers. With all this situation one in four Europeans cannot properly heat or cool their homes. In Portugal it is the fourth most energy-poor country, according to the European energy poverty index. To confirm these data we can see that 69.5% of Portuguese dwellings have as energy classification C and F (Less efficient classes). Why are we energetically poor in Portugal? The European Union considers a basic indicator of the well-being of families is thermal comfort. This results in Portugal the heating of houses is neglected, normalizing to feel cold indoors, for example.

One way to combat energy poverty can be: Increase the energy performance of homes by replacing and adoption of new, more efficient equipment, new materials, technologies and processes that increase the energy performance of buildings, housing and equipment, reducing energy needs without prejudice to the comfort, well-being and interior quality of housing; strengthen the conditions for access to energy services by providing mechanisms to facilitate and support access to essential energy services for the well-being and health of households in energy poverty, including access to new forms of energy production, including through self-consumption and renewable energy communities; increasing energy literacy resulting in increased awareness and the adoption of best practices on streamlining energy consumption; Help the most deprived families financially. The level of health is closely related to the energy efficiency of a dwelling, so if there is energy poverty at the outset the state of health will worsen, because as mentioned throughout the work a housing with energy poverty does not present the necessary conditions to sustain the basic necessities of life.

Our work aims to address the theme of energy poverty and how it relates to health, at national and global level.

Keywords: poverty energy, health, heat, cold, dwellings, energetic efficiency, costs, technologies, reduce.

ECTOPIC PREGNANCY

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Ectopic pregnancy corresponds to the nidation of the egg outside the endometrial cavity, and may be located in the fallopian tubes, ovaries, peritoneum, broad ligament, cervix and tubal interstitium.

There are some factors that increase the risk of an ectopic pregnancy, such as the age of the pregnant woman, between 25 and 34 years old, the use of IUD, in vitro fertilization, smoking, pathologies in the fallopian tubes and in the endometrium, sexually transmitted diseases such as chlamydia, delayed ovulation or even if she has had previous tubal ligation/reconstruction.

The most common clinical manifestations are vaginal bleeding and abdominal pain that usually appear between the sixth and eighth week after the last menstrual period.

The diagnosis of ectopic pregnancy is based on clinical history, human chorionic betagonadotrophin (β -HCG) dosage and transvaginal ultrasound findings. Sometimes an ultrasound-guided laparoscopy is necessary where they collect fragments for analysis.

Women diagnosed with unruptured ectopic pregnancy are potential candidates for medical treatment with methotrexate and by dosing of β -HCG. If there is injury to the location of the ectopic pregnancy, radical surgery is required.

Keywords: Ectopic Pregnancy; β -HCG; Risk; Clinical Manifestation; Diagnosis

EPIDERMODYPLASIA VERRUCIFORMIS

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Epidermodysplasia verruciformis (EV) is a rare genodermatosis in which patients show an unusual predisposition to certain types of Human Papillomavirus (HPV) leading to the clinical presence of pityriasis versicolor-like spots and hypo- or hyper-pigmented macular lesions. It is a multifactorial disease involving genetics, immunologic and extrinsic factors.

There are 2 forms of EV: inherited, with an autosomal recessive pattern, and an acquired type, almost indistinguishable and found mainly in HIV-infected or immunosuppressed individuals.

EV is a sporadic condition and there is no previously described correlation between this disease and gender or age.

EV is strongly associated with mutations found in EVER1 and EVER2 (Epidermodysplasia Verruciformis Enhancing Region) which affect the transmembrane channel proteins TMC6 and TMC8, respectively.

This mutation leads to the persistence of EV-associated HPV types and uncontrolled proliferation of stem cells mainly infected by HPV5 and HPV8 (other HPV types might be associated).

Skin biopsy is essential to diagnosis, being done in some affected areas, showing lesions similar to flat warts displaying hyperkeratosis, hypergranulose, and epidermis acanthosis. Keratinocytes of the upper epidermal layers show perinuclear vacuolization and a typical blue-gray discoloration. As a complement, molecular analysis to identify known mutations associated with EV can also be made to further confirm the diagnosis.

Keywords: Epidermodysplasia Verruciformis; HPV; EVER1; EVER2

TERATOMAS

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Teratomas are a common form of Germ cell tumors (GCTs) that can appear in both children and adults. They are defined histologically as containing tissues developed from 3 germ cell layers: ectoderm, mesoderm and endoderm. Macroscopically, these injuries don't have a characteristic shape or size, as it depends on microscopic heterogeneity of their content. The majority of teratomas contain fat and they can also grow hair, muscle, teeth, or bone. Although teratomas are found primarily in the gonads, they can occur anywhere in the body. These tumors are mostly benign, however 1% to 2% of them may evolve into a malignant transformation. They are most predominant in women and can be categorized as mature or immature based on the degree of differentiation of their components, with immature tumors being more likely to be malignant in adulthood. They can also be labeled as prepubertal and postpubertal teratoma, being this last one more frequent. Postpubertal type is highly associated with germ cell neoplasia in situ and chromosome 12p amplification unlike prepubertal one that is not associated with either of them. Diagnostic methods used to determine size and location include X-Ray, computed tomography, magnetic resonance and ultrasound. There are also blood tests that can help check the hormone levels and tumor markers. Furthermore, biopsy helps us to look over its benign or malignant character. Our main goal is to do a review of this fascinating tumor with a histologic point of view.

Keywords: Teratoma; Germ cell tumors; Gonads; Histology; Biopsy

TWIN-TO-TWIN TRANSFUSION SYNDROME

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Twin-to-twin transfusion syndrome (TTTS) is a rare pregnancy condition that affects monochorionic twins, this means they share one placenta and a network of blood vessels. Twin-twin transfusion syndrome affects 10% to 15% of monochorionic twins and has considerably less artery-to-artery anastomoses. The vessel connections within the placenta are not always evenly distributed, resulting in an imbalance in blood exchange between the twins. The donor twin, gives more blood than it receives, putting it at risk of malnourishment and organ failure. The recipient twin is susceptible to hypervolemia, causing increased production of urine and amniotic fluid.

The diagnosis can be done by conducting tests such as measuring amniotic fluid volume, bladder filling and blood flow in the recipient and donor twins. The twins' state of cardiovascular dysfunction is an important factor in determining the prognosis of TTTS, as the recipient twin is prone to heart overwork and other cardiac complications.

There are a few treatments available for TTTS, but only the most severe forms should receive fetal intervention, laser fetal reduction is one of them, which consists of the separation of the blood vessels shared between the two twins. Amnioreduction can be done in less severe cases.

Histologically, the portion of the donor's placenta has large edematous villi, smaller capillaries with nucleated red blood cells. While the recipient's portion has small, firm and mature villi with congested vessels.

Keywords: monochorionic, anastomoses, placenta, laser fetal reduction

FAMILIAL ADENOMATOUS POLYPOSIS

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Familial adenomatous polyposis is an inherited, autosomal dominant disease in which hundreds of precancerous polyps develop along the large intestine and rectum during childhood or adolescence. By the age of 40, polyps almost often progress into colon or rectum cancer in untreated individuals. FAP occurs in one in every 8,000 to 14,000 people.

Endoscopic surveillance should be done for known inherited mutations. In 1991 the adenomatous polyposis coli (APC) gene was identified which is responsible for most cases. In 2003 a FAP “APC negative” patient was found who carried biallelic mutations in the MUTYH gene.

Most people go years without experiencing any symptoms before their adenomas become large and numerous, cause rectal bleeding or even anemia, or progress to malignancy. Typically, malignancies begin to manifest ten years after the onset of the polyps. Constipation or diarrhea, stomach pain, palpable abdominal lumps, and weight loss are examples of nonspecific symptoms.

A suggestive family history, clinical findings, and a large bowel endoscopy or full colonoscopy are used to make the diagnosis. Whenever possible, genetic testing should be used to confirm the clinical diagnosis. It is possible to perform presymptomatic, prenatal and even preimplantation genetic testing.

Surgical options should be considered taking into account the age of the patient and the severity of the disease. Prophylactic colectomy and proctocolectomy are the most recommended treatments to reduce the risk of colorectal cancer. Chemoprevention has been essential in reducing polyps.

Keywords: FAP; Polyps; Symptoms; Cancer; APC gene

HYDROPS FETALIS

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Hydrops fetalis is a lethal condition that occurs due to the accumulation of extracellular fluid in the soft tissues and serous cavities of the fetus during gestation. It is classified into immune and non-immune according to the presence or absence of antibodies against erythrocyte antigens.

The incidence of Non-Immune Hydrops fetalis is 1:1700 to 3000 pregnancies, with over 100 conditions currently described. Cardiac etiology is the most common most often, accounting for about 20% of cases of nonimmune hydrops.

This condition is very serious, difficult to treat and can lead to early infant death or miscarriage. Moreover, this problem can arise naturally in an apparently healthy pregnancy. When discovered during pregnancy it may be recommended the use of corticoid medication or surgery on the fetus still in the womb to correct some problems. The diagnosis is made through ultrasound, where the doctor can observe problems such as subcutaneous edema, pleural effusion, pericardial effusion, ascites, increased amniotic fluid and fetal structural anomalies. Surveillance and action depend on the gestational age, the etiology, the severity and the possibility of treatment in utero.

Keywords: Hydrops fetalis; genetic syndromes; neonatal outcomes; Prenatal diagnosis

AMYLOIDOSIS

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Amyloidosis is a group of pathologies caused by the extracellular deposition of insoluble amyloid fibrils in organs and tissues.

In accordance with insoluble fibrillary protein and amyloid deposition distribution, this complex of pathologies can be classified such as systemic, localized, acquired and hereditary. Despite of this classification, the clinical manifestations of the different forms of amyloidosis largely overlap and depend upon the effected organ.

It may present renal, cardiac, gastrointestinal, neurological, musculoskeletal, pulmonary and dermatological manifestations.

Amyloid fibrils are identified in tissue sections obtained at biopsy or necropsy.

Generalized amyloidosis is usually a slowly progressive disease that leads to death if left untreated. The progression of the disease essentially depends on the organ that is affected.

Generalized amyloidosis is usually a slowly progressive disease that leads to death if left untreated. The progression of the disease essentially depends on the organ that is affected.

Cardiac involvement is an important factor of bad prognosis. The main causes of death are chronic renal failure, sudden death caused by arrhythmias, gastrointestinal bleeding, respiratory failure, cardiac insufficiency and infections.

Amyloidosis`s treatment must be targeted to reduce precursor production, to inhibit the extracellular deposition of amyloid fibrils and to promote the lysis or mobilization of existing amyloid deposits. Therefore, the correct treatment of amyloidosis requires an early diagnosis, correct classification of the type of amyloidosis, effective treatment and supportive care.

The choice of treatment depends on the type of amyloidosis involved.

Keywords: Amyloidosis, Fibrils, Disease, Deposition, Prognosis

CUSHING'S SYNDROME

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Cushing's syndrome is a microadenoma caused by excess of adrenocorticotrophic hormone, produced by pituitary gland, that stimulates the adrenal gland which leads to excess of cortisol, the stress hormone. It's typically divided into two categories: ACTH-dependent (80-85%) and ACTH-independent (15-20%).

The annual incidence of Cushing's disease is 1.2–1.7/million per year. The calculated annual incidence of Cushing's syndrome induced by a nonmalignant cause was 2.3/million. The median age at first admission was 41.4 years, and the female:male ratio was 3:1.

In order to get histologic results, tumors like hipofisary tumor, unilateral suprarenal carcinoma, micro and nodular dysplasia and unilateral suprarenal adenoma need to be removed and examined in a pathological anatomy laboratory.

Some histologic features observed in imuno-histochemistry studies are distinct cellular groups presenting a reaction with different antibodies; and in an area of the neuro-hipofise we could see basophils penetrating the neural tissue. It's also possible to observe epithelial neoplasia of adenomatous pattern, formed by a proliferation of polygonal cells, with a large and basophilic cytoplasm. Currently, the tests used to confirm the diagnosis of Cushing's Syndrome need a more careful interpretation and therefore are not ideal. Finally, recent new insights into the pathophysiology of Cushing's syndrome at the molecular level raise expectations for the introduction of more accurate diagnostic tests and effective therapies for this disease in the near future.

Our aim is to explore the importance of the histologic features and methods of diagnosis of Cushing's Syndrome.

Keywords: ACTH; Pituitary Tumor; Cushing's Syndrome; Epithelial Neoplasia; Microadenoma

HEPATITIS B

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Hepatitis B is a liver infection caused by a DNA virus. The virus is transmitted through contact with infected blood and bodily secretions, with the main transmission route being vertical.

The infection can cause both acute and chronic disease. High serum Alanine Transaminase levels, as well as HBsAg and HBcAg test results and a discrete onset of symptoms are all indicators of Acute Hepatitis B (AHB). Chronic hepatitis B (CHB) is defined as the persistence of HBsAg for more than six months. These Individuals are at risk of developing Hepatocellular Carcinoma (HCC) and Cirrhosis, but with proper treatment, morbidity and mortality are reduced. Current therapies cannot eradicate the virus so treatment is aimed at preventing the progression of liver disease to cirrhosis, HCC, liver transplantation, and death.

AHB is characterized by lobular disarray, ground glass hepatocytes with central ballooning degeneration, apoptotic bodies, lymphocyte predominant lobular and portal inflammation.

In CHB there is a variable degree of predominantly lymphocytic portal inflammation with spotty lobular inflammation.

Liver biopsy is recommended to identify precursor lesions in order to determine the stage of liver disease (inflammatory activity and fibrosis), the patient prognosis and the interventions needed as well as the need for HCC surveillance and initiating antiviral treatment in CHB.

Biopsy evaluation remains the gold standard for providing important information on the phase of infection (by immunohistochemistry), degree of liver injury, immunopathology (via the nature of infiltrating cells), the presence of contributing pathology (such as fat and iron) and the identification of preneoplastic lesions.

Keywords: Hepatitis B; acute and chronic infection; Hepatocellular Carcinoma; liver biopsy; immunopathology

THERAPEUTIC INDICATIONS OF POMEGRANATE

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The pomegranate is of therapeutic interest since it has several medicinal characteristics.

The peel has been used to treat diarrhoea and inflammation, the flowers can be used for cardiovascular disorders and diabetes, the leaves help with weight loss and diabetic nephropathy, and the juice is rich in vitamin C. Gain knowledge about the therapeutic effects of pomegranate.

We searched information in electronic databases (Pubmed, ScienceDirect and Google Scholar), with "pomegranate", "drug", "treatment" and "nutrition" as keywords.

The peel extract has intense antifungal and antibacterial activity, attributed to the presence of polyphenols preventing the proliferation of bacteria.

A study investigated the anti-inflammatory effects of the oil's polyphenols from the seeds (2 capsules/day for 4 weeks) in type 2 diabetic patients. They reduced lipid peroxidation and modulated liver enzymes.

Studies indicated that pomegranate has anti-cancer properties due to the very strong cytotoxic effect on tumour cells by conjugated linoleic acid in seed oil.

It has been established that pomegranate flower extracts can reduce blood glucose levels and affect obesity control. The peel extract has antidiabetic properties that shown to be effective in inhibiting the oxidative stress of chronic hyperglycemia. In addition, antioxidant assays showed an increase in free radicals that are needed to increase normal metabolism.

It was demonstrated that the consumption of pomegranate juice (1.5 ml/kg) in diabetic patients significantly reduces insulin resistance and increase β -cell function.

Due to its constituents and nutritional properties, pomegranate has been widely used as a supplement to alleviate or prevent symptoms of various diseases.

Keywords: pomegranate, drug, treatment, nutrition

"CAFFEINE SUPPLEMENTATION IN HIGH COMPETITION ATHLETES"

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Caffeine is the most widely consumed psychoactive substance in the world, and it can get it from coffee, tea, and cocoa or in a synthetic form. Athletes consume it through capsules, energy drinks, and gels, among other forms. Caffeine supplementation during competitions has increased after it was removed from the list of banned substances by the World Anti-Doping Agency. Caffeine is metabolized in the liver by the enzyme Cytochrome P450 1A2 (CYP1A2). Its main target is the central nervous system. It's binding to adenosine receptors causes an increase in the concentration of neurotransmitters, leading to pain suppression and increased alertness. Its main side effects are tachycardia, insomnia, and sleep disturbances.

This review aims to understand how caffeine affects athletes' performance during competitions. The platforms used for this research were PubMed®, Google Scholar®, Wiley®, Mendeley®, Frontiers® and ScienceDirect®. The time interval chosen was from 2016 to 2023. The keywords used were "caffeine"; "side effects"; "supplementation"; "sports"; "athletes". The results were based on 25 articles.

According to the research, caffeine improves athletes' performance. Still, its ergogenic effect depends on the dose, the time of intake (before, during, or at the end), the form of consumption, and individual (genetic) factors. The most common dose is between 3 and 6 mg/kg 60 minutes before exercise.

So, we conclude that caffeine has advantages for athletes, but we must be aware of its side effects.

Keywords: "caffeine"; "side effects"; "supplementation"; "sports"; "athletes"

NEONATAL VITAMIN A SUPPLEMENTATION

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This work intends to evaluate the efficacy and safety of supplemental vitamin A in premature babies. Based on an example, this being bronchopulmonary dysplasia, where the deficit of this vitamin is harmful, and its supplementation may be beneficial.

A bibliographical search was done indifferent databases including "Google Scholar" and "Virtual Health Library", "PubMed", "Science Direct" using keywords such as "vitamin A" and "neonatal supplementation" and the articles of the last five years are chosen.

This vitamin is required for normal cardiovascular development a the beginning of pregnancy. Postnatal may also increase phospholipid protein synthesis to promote the synthesis of pulmonary surfactant improving lung development.

Vitamin A supplementation was suggested as a potential preventive measure against BPD due to its role in lung maturation.

A common dose evaluated for human neonates is 15,000 µg. High-dose supplementation is usually given as preformed vitamin A.

In conclusion, the results of this review suggest that vitamin A supplementation may have a modest benefit in reducing the risk of BPD in preterm infants. However, further studies are needed in this field.

Keywords: Vitamin A and neonatal supplementation

FOLIC ACID IN PRE AND POST CONCEPTION

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Introduction: The microenvironment and nutritional condition of the mother influences the development of the embryo.

Folic acid (folate or vitamin B9) is an oxidisable and water-soluble molecule that is fundamental in the process of cell multiplication. It is present in natural foods, fortified foods and dietary supplements.

Objective: The aim is to convey the importance of folic acid supplementation in preconception and pregnancy.

Methods: A search was made using Pubmed, Scielo.org and Sciencedirect. The terms "Folic acid", "Pregnancy" and "Folic acid in pregnancy" were used. Articles between 2020 and 2022, written in English and Portuguese, were restricted.

Results: Adequate nutrition is fundamental in pregnancy, folic acid needs increase due to the rapid cell division of the foetus and increased urinary losses. The WHO recommends taking 0.4 mg of folic acid 5/6 months before conception up to 12 weeks gestation.

Folic acid deficiency is responsible for 2 to 3% of prenatal or neonatal abnormalities and 4 to 5% of all malformations after birth.

In preconception, folate deficiency is involved in preventing congenital malformations and neural tube defects. During pregnancy, it can lead to pre-eclampsia, gestational diabetes and is associated with megaloblastic anaemia in the foetus, placental abruption, premature birth and low birth weight.

Conclusion: We conclude that during preconception and pregnancy there must be a healthy diet rich in folic acid and information about the benefits of supplementation, reducing the risk of neural tube disease, but not all cases can be prevented.

Keywords: Folic acid; pre and post conception; supplementation

KEFIR'S INFLUENCE ON HUMAN HEALTH

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Maintaining a healthy and balanced intestinal microbiota is extremely important for health. The intestinal microbiota is easily unbalanced by factors such as stress, diet, gastrointestinal diseases, and drug use, which can cause pro-inflammatory immune responses and pathologies such as cancer. Probiotics are used because they have a bacterial composition. Studies with rates are being carried out to prove how they can be beneficial for human health. Its use is efficient in stimulating the homeostasis of the intestinal microbiota and has beneficial effects, leading to the potential control of diseases associated with the intestinal microbiota. Kefir is a low-alcohol and acid fermented drink that, subjected to the substrate used, can be dairy or non-dairy. Its main polysaccharide, Kefiran, has very important physicochemical properties that increase the viscosity and viscoelasticity of milk. Kefir has been assigned as a low-cost homemade drink and natural folk medicine. However, some studies suggest that making artisanal Kefir may result in contamination associated with poor hygienic practices and, therefore, potential health risks for consumers.

A randomized study with nine metabolic syndrome individuals, where they introduced 180 ml/day of Kefir on their diet, showed improvements at many metabolic factors such as antihypertensive, anticancer, anti-inflammatory, antioxidant, antidiabetic, and hypocholesterolemic potential levels. Study advancements of this natural ingredient are being made, Kefir will likely be recognized for the effective treatment of various pathologies in the near future.

Keywords: Nutrição, microbiota, probiotics, Kefir, Kefiran

EFFECT OF NUTRITION ON PAIN REDUCTION IN FIBROMYALGIA

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Introduction: Fibromyalgia (FM) is a chronic pain condition that requires multidisciplinary treatment. Patients with fibromyalgia often suffer from eating disorders, obesity, metabolic syndrome, and other gastrointestinal symptoms. Studies have pointed out nutrition as a relevant factor in these patients. Some think diet influences fibromyalgia symptoms and tend to adopt certain dietary patterns.

Aim: This study aimed to investigate the effects of nutrition on the treatment of fibromyalgia

Methods: The scientific review was based on “PubMed”, “ScienceDirect”, and “EuropePMC”, using the keywords “Fibromyalgia” and “Nutrition” between 2017 and 2022.

Results: Fibromyalgia has a significant negative impact on the quality of life of patients, so it's important to implement non-pharmacological treatment regimens consisting of physical exercise and dietary supplements, particularly those rich in vitamins B9 and B12, magnesium and calcium. The reduction of muscle pain is achieved through a low-carbohydrate, micronutrient-balanced diet, which allows the neurotransmitters to recover through the correct function of calcium.

Conclusion: In conclusion, there is a significant improvement in the symptoms of patients with fibromyalgia and, consequently, an improvement in their quality of life. Therefore, with the good practice of eating habits and through the administration of nutritional supplements, when the diets applied are insufficient for the adequate supply of minerals, it is possible to reverse the pain caused by this chronic disease substantially.

Keywords: Fibromyalgia; Nutrition; Pain

ENZYME ERRORS: PHENYLKETONURIA

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Introduction: Phenylketonuria is a condition that results from an enzyme failure of phenylalanine hydroxylase, which encodes phenylalanine (PHE) into tyrosine. PHE is an essential amino acid obtained from the diet, and is important for the production of other proteins and for the formation of neurotransmitters. In case of PHE deficiency, PHE accumulates in the blood and brain, causing irreversible neurological and cognitive damage. Medical and nutritional support is advised to regulate the diet according to the severity of the disease.

Objective: The aim of this paper is to describe the pathology in the neonatal and childhood periods, and the effects of protein and phenylalanine amino acid substitutes have on nutritional therapy.

Methods: In the present work, we searched the Pubmed, Science Direct, and Mendeley databases for information after searching and analyzing abstracts and introductory texts of articles. The work was based on 25 articles with information from review articles from 2014 to the present.

Results/Discussion: European guidelines recommend PHE concentrations between 2 and 6 mg/dL in children up to twelve years old. Treatment consists in maintaining a diet low in PHE, with a recommended daily protein intake of 10g, supplemented with L-amino acids without PHE. Sapropterin dihydrochloride, a synthetic formulation, has shown efficacy in reducing serum PHE concentrations and improving dietary tolerance. Studies recommend one dose per day, depending on weight, in patients under four years old.

Conclusion: Evidence confirms that sapropterin dihydrochloride reduces the concentration of PHE in the blood and increases protein tolerance.

Keywords: children; phenylketonuria; treatment

ELECTROCARDIOGRAPHIC PATTERN IN THE CAPE VERDEAN POPULATION AND THE PORTUGUESE POPULATION

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The study of the electrocardiographic characteristics of different ethnic groups is crucial, since the reference values of ECGs of Caucasian individuals can not be generalized to all ethnicities. In medicine, the black population is little studied, and the same is true in electrocardiography.

There are several normal patterns in black ethnicity, which may be malignant in Caucasian ethnicity. In this sense, this study aims to verify the existence of electrocardiographic differences between individuals from the Cape Verdean population and the portuguese population. With this, pertinent questions about the theme arise: Does genetic predisposition determine the electrocardiographic pattern of Africans? Does this difference lead to increased cardiovascular risk or arrhythmic risk in healthy young/adults?

To obtain answers, an electrocardiograph will be used in order to describe the electrocardiographic pattern. This follows the recommendations of the American Heart Association. With this, it is intended to assess the heart rate variability of individuals in the study population. Sociodemographic data will be collected using a questionnaire.

This is an observational, cross-sectional, descriptive study, in which the clinical trial will focus on a sample of 60 participants, 30 Cape Verdeans and 30 Portuguese.

Some studies have concluded that black ethnicity presents a higher QRS voltage, an early repolarization pattern, a pre-recorded T-wave inversion, and anterior ST-segment elevation associated with T-wave inversion. Thus, we intend to clarify this issue, and thus contribute to a better analysis of ECG in black individuals.

Keywords: ECG in Africans, ECG of Caucasians, heart rate variability, electrocardiographic changes, electrocardiogram of black ethnicity

SLEEP AND CARDIAC ARRHYTHMIAS IN ROTATING SHIFT WORKERS - STUDY BY HOLTER

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Shift work is a method of organizing work in shifts that is used by several companies in Portugal, with positive as well as negative factors both for workers and for family life. Due to the rotation of schedules, it is required a constant adaptation of the normal sleep-wake cycle, which has repercussions on social performance, sleep and especially on the individual's health. In this study, we hope to observe a relationship between the circadian rhythm in rotating shift workers, and the existence of sleep apnea and cardiac arrhythmias in these workers. Data collection takes place while the individual works a night shift, with 24-hour Holter monitoring and after the worker answers a questionnaire about daytime sleepiness and the probability of apnea.

The sample will be composed of at least 15 male workers, between 25 and 60 years old, with a minimum of 3 years of work in rotating shifts.

Keywords: Rotating shift work; circadian rhythm; sleep deprivation; cardiac arrhythmias

MORRIS INDEX AND LEFT ATRIAL OVERLOAD IN ATHLETES - ELECTROCARDIOGRAPHIC AND ECHOCARDIOGRAPHIC PATTERN

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Left atrial overload is characterized by an abnormal enlargement of the left atrium that can be caused by several causes.

The ECG is of great importance in the clinical evaluation and in the observation of the Morris Index, which corresponds to the terminal force of the P wave, in lead V1, with an increase in depth and duration that leads to this increase in left atrial overload.

Some electrocardiographic alterations are commonly observed in high-performance athletes and, although they present characteristics identical to those observed in patients with cardiovascular disease, they are considered normal characteristics because the alterations are correlated with intrinsic physiology and with the increase in the cavity associated with physical effort.

This study aims to identify a possible positive association between left atrial overload and the Morris Index in athletes through an echocardiography and electrocardiography study.

The sample will consist of a minimum of 30 male participants, who will have to perform the two diagnostic techniques (ECG and ECHO).

Keywords: Left atrial overload, Morris Index, athletes, electrocardiography, echocardiography

STRESS, ANXIETY AND DEPRESSION: STUDY OF THE RHYTHM PROFILE IN COLLEGE STUDENTS

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The diagnosis and prevalence of stress, anxiety and depression have increased in recent years, with an intense increase after the pandemic period of the 2nd decade of the 21st century. However, the effects of these factors and pathologies on the cardiovascular system is a world to explore. It is a fact that there is still not much knowledge about the influence of mental health issues on several different human systems. This study aims to find answers to these same questions.

After classifying and distinguishing the degrees of stress, anxiety and depression through DASS21 scale, the performance and analysis of the Holter obtained in the different samples will allow to find differences in parameters that may be influenced by the conditions and pathologies mentioned. In this study, we will aim to find dysfunctional patterns in the rhythm profile of those who suffer from stress, anxiety and depression.

The present study to be carried out aims to verify the influence of mental health on cardiovascular health, focusing on parameters monitored by Holter, being supported by recent research.

Keywords: Mental Health; rhythm profile; holter

ELETROCARDIOGRAPHIC MARKERS OF CONDUCTION/REPOLARIZATION AND ARRHYTHMIC RISK IN FEMALE FUTSAL ATHLETES”

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Eletrocardiographic conduction/repolarization markers are an important tool for quantifying arrhythmic risk. Most of the conduction and repolarization markers are used in people with previously known arrhythmic risk, as the objective is to stratify and classify it.

There are multiple markers of arrhythmic risk, and the importance of their study is based on abnormalities in the depolarization or conduction process and in repolarization, that increase the risk of developing arrhythmias. Furthermore, studying the electrocardiographic components that translate these moments of conduction, QRS, and repolarization, such as the QT interval and the T wave, can give us a lot of information on conduction velocity, difference in conduction times between regions, duration of the potential of action and its difference in two regions, dispersion of repolarization, duration of the alternating action potential, dispersion between depolarization and repolarization. Alterations in these parameters may lead to a higher arrhythmic risk.

Since there is no clear evidence of whether this markers are altered by physical exercise, the aim of this study is to analyse their components in athletes and understand their correlation with exercise and afterwards the relationship with arrhythmic risk, because exercise can be a trigger in pre-existing cardiac abnormalities.

Keywords: Conduction and repolarization markers, sudden cardiac death, athletes

FOOD INSECURITY AND TENSION PROFILE

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Food insecurity is an economic and social condition with family involvement, in which access to food is limited or uncertain. So, food insecurity is considered a public health problem associated with a diet with poor nutrients and, consequently, with several risks factors for health like heart disease, hypertension, diabetes, obesity and depression. Currently, the accentuation of social inequalities, the covid 19 pandemic and, more recently, the Russian-Ukrainian war have been identified as some of the risk factors for the development of food insecurity and, consequently, chronic diseases. Considering the importance of this public health problem, we intend to correlate the impact of food insecurity on blood pressure and arterial stiffness values.

Keywords: Food insecurity, blood pressure, hypertension, chronic diseases

HORMONES OF THE MUSCLE AND BONE: OSTEOCALCIN AND MYOKINES

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The present research focus in the hormones of the muscle and bone: osteocalcin and myokines, which are a significant part of the musculoskeletal system.

Osteocalcin is a hormone secreted by mature osteoblasts and it's the most present non-collagen protein in the bone. The osteocalcin mainly gets into the organic bone matrix (carboxylated) to ossify. However, a low percentage enters the bloodstream (decarboxylated). The percentage of osteocalcin is considered to be directly related to bone formation.

This hormone has also a role in male's fertility, insulin secretion, direct effects in the central nervous system and its synthesis is stimulated by physical exercise.

Myokines are produced and released by myocytes (muscle cell) not only when the muscle is relaxed but also when contracted. More than 600 different types of myokines have been discovered. These hormones have an important role in the regulation of autocrine, paracrine and endocrine systems and their respective functions as well as in the regulation of the muscular metabolism.

Myokines are also involved in muscle proliferation, differentiation and regeneration. During exercise, myokines signal within the muscle and mediate muscle–organ crosstalk to the brain, adipose tissue, bone and other organs.

Osteocalcin and myokines are indispensable to the organism: from regulating the musculoskeletal system to preventing critical diseases and maintaining vital functions.

Keywords: osteocalcin, myokines, musculoskeletal system, muscle, bone

PHYSIOLOGY OF BONE REABSORPTION AND BONE CELLS

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The human bones are divided into 4 types: long, short, flat and irregular. Each one of these are composed of bone cells, such as osteoclasts (that participate in bone remodelling), and osteoblasts (responsible for the formation of bone tissue and osteocytes).

In reabsorption, the osteoblasts produce a substance called RANKL that binds to RANK receptors nearby, essential for the stimulation of osteoclastogenesis forming a multinuclear cell called osteoclasts, that break the bone tissue and liberate minerals into the blood flow, resulting in a transfer of calcium and phosphate from bone tissue to the blood.

The bone remodelling cycle operates continually as osteoclasts are constantly removing mature bone, with new bone simultaneously formed by osteoblasts, bone resorption is their unique function.

This process is heavily affected by various hormones: the parathyroid (PTH) glands, structures located on the thyroid gland, release parathyroid hormone in response to a drop in blood calcium levels. These hormones stimulate the osteoblast to release RANKL, which triggers bone resorption allowing calcium ions to be released into the bloodstream correcting the deficiency.

However, when the blood calcium levels are higher than normal the parathyroid glands release less hormones to have less resorption. In addition, parafollicular cells produce calcitonin. High calcitonin levels inhibit bone resorption which results in lower blood calcium levels.

Vitamin D stimulates intestinal absorption of calcium which makes the level of calcitonin inhibiting the bone resorption. It regulates receptor activator of nuclear factor kappa-B ligand (RANKL) and osteoprotegerin (OPG) expression levels positively and negatively. It is also used as an inducer of osteoclast formation.

Keywords: bone reabsorption; RANKL/RANK; bone cells;

ENDOTHELIAL DYSFUNCTION, ATHEROSCLEROSIS AND ARTERIAL HYPERTENSION

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Coronary artery diseases are caused by the accumulation of fat inside arteries, leading to an insufficiency in the blood vessels that have the function of supplying the heart, in order to provide the myocardium with the nutrients and oxygen necessary for it to function.

One of these is atherosclerosis, and it occurs when the blood vessels become inflamed, restricting blood flow to the organs and tissues. Some of the symptoms are shortness of breath and muscle weakness, which can be caused by diabetes, obesity or smoking.

Related to this condition is hypertension. It refers to the persistent high blood pressure which leads to premature damage on the arteries. Its treatment depends on its severity, people with moderate hypertension can control it by improving their lifestyle habits such as reducing salt and alcohol intake and physical exercise.

Finally, endothelial dysfunction is the altered endothelium-dependent vasodilatation, which results in localized inflammation and, subsequently, vascular lesions. It occurs when vessel constriction overlaps with dilatation and can be defined as an endothelium-dependent alteration of vascular relaxation.

The role of physiotherapy is associated to the cardiovascular rehabilitation and it's fundamental for patients with coronary artery disease, thus improving the irrigation of the heart muscle, which prevents the progression of pathologies and episodes harmful to our health.

Keywords: arteries, dysfunction, inflammation

DEMYELINATING DISEASES

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Much of the nerves in our body are surrounded by a protective layer called myelin sheath. The myelin present in the sheaths is a lipid substance produced by different types of glial cells: Schwann cells in the Peripheral Nervous System and Oligodendrocytes in the Central Nervous System. Their function is to effectively protect and promote the rapid spread of action potentials throughout the axon, wrapping it in several concentric layers of plasma membrane, thus giving rise to the myelin sheath.

Over the years, the myelin layer is destroyed, however, having the ability to regenerate. When this regeneration doesn't happen for some reason, such as infections, genetic predisposition and vitamin B12 blockage, that is, when the immune system becomes more susceptible, it begins to destroy the sheaths, giving rise to demyelinating diseases.

Some examples are: Acute Disseminated Encephalomyelitis, prevalent in children, caused by viral infections; Adrenomyelolomyloneuropatia, predominant in adults, caused by a chromosomal genetic mutation.

Multiple Sclerosis, the most common, is a disease which mainly affects young women (20 - 40 years). Its onset and prevalence in females is closely associated with hormonal factors and obesity. Although there is no cure for this disease, there are treatments that allow the individual to have a better quality of life. In addition, it is also important to highlight the work of physiotherapy in the recovery and increase of patient functionality through gait, balance and transfers, so as to give you security and autonomy so that you can participate again in your daily activities.

Keywords: Myelin sheath, Nervous System, destruction, infections, demyelinating disease, regeneration, Multiple Sclerosis.

THE PINEAL GLAND

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The pineal gland is an endocrine gland that is located in the diencephalon, in the area of the epithalamus, more exactly in the third ventricle of the brain.

The pineal gland is mainly responsible for controlling biological cycles by producing the hormone melatonin (a hormone derived from amino acids synthesized from tryptophan), which is synthesized and released rhythmically during the dark period of the day-night cycle and inhibited by light. In lower vertebrates the pineal gland itself is photosensitive and can regulate the circadian clock by itself. In mammals, including humans, the gland has lost this ability, but reacts to light by a multisynaptic mechanism via retinal ganglion cells that contain a certain type of photopigment, melanopsin, which transmits information to the pineal gland.

Over time the pineal gland loses its function. This process is explained by the decrease of pinealocytes, which are the main cells contained in the pineal gland. Consequently this decrease will affect the production of melatonin, which will have an impact on the sleep cycle, decreasing the duration of sleep over the years.

Melatonin also stimulates immune processes acting, regulates the reproductive activity by decreasing the production of sex hormones (which will reduce reproductive activity in winter and autumn, because the light periods are shorter and more melatonin are produced) and plays an important role in regulating glucose metabolism and energy balance.

The pineal gland acts as the body's recovery system, helping in endocrine functions very important for the body's homeostasis.

Keywords: Melatonin, sleep, circadian rhythm

NEURODEGENERATIVE DISEASES: PARKINSON AND ALZHEIMER

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Neurodegenerative diseases occur when cells of the nervous system (neurons) in the brain and spinal cord begin to deteriorate. Changes in these cells cause them to function abnormally and eventually lead to cell death. In these diseases, when a large number of neurons die, symptoms gradually worsen and can lead to death. The most known neurodegenerative diseases are Alzheimer and Parkinson.

Alzheimer is a neurodegenerative disease and a known type of dementia that causes progressive and irreversible deterioration of cognitive functions. Some consequences of Alzheimer's disease are personality changes; the individual's behaviour and the capacity to make fundamental and well thought decisions are changed. Pathologically, Alzheimer's disease is characterized by the presence of senile plaques, neurofibrillary tangles and neuronal loss in the hippocampus and cerebral cortex in a diffuse situation. This leads to a marked loss of cholinergic fibers that exert a modulating action on the activity of memory-related neurons in the limbic system and neocortex. Parkinson's disease is a chronic progressive neurodegenerative disorder, classified as a movement disorder. The cause of this illness remains unknown; it's characterized by the destruction of dopaminergic neurons located in the substantia nigra. This is lead by an abnormal synaptic protein alphasynuclein acumulation in the Lewy body of surviving cells. It causes muscular stiffness, postural instability, body tremors, akinesia and bradykinesia. The incidence of this pathology is 10 times higher from the age of 60.

The physiotherapists interveins in the recuperation and the treatment of parts of the body that suffer some damages.

Keywords: Neurodegenerative Diseases; Alzheimer; Parkinson; neurons

ELETRIOCARDIOGRAM AND IF CURRENTS

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Funny current or I_f refers to a specific current in the sinoatrial node of the heart. This current contains sodium-potassium ions that are activated by hyperpolarization. The funny current is also responsible for the natural diastolic depolarization, which leads to the automaticity of the sinus node. Therefore, this current determines the heart rate and controls the rate of the sinus node activity.

Electrocardiogram (ECG) is a simple test done with an electrocardiograph and usually ten electrodes disposed on the patient's skin that can be used to check the rhythm and electrical activity of a patient's heart, that is, the time and strength of electrical impulses by tracing lines on paper.

Despite using only ten electrodes, the information of heart electrical activity can provide twelve different perspectives. The test results are based on the Einthoven's triangle, which determines the electrical axis of the heart. This imaginary triangle consists of three limb leads.

The electrocardiographic tracing expresses the movement caused by the electrical stimulus (contraction and relaxation) and is formed by P, Q, R, S and T waves, whose meaning is related to the phenomena of depolarization and repolarization in each of the heart regions and the current propagation in all the space directions. Through the analysis and diagnosis of an electrocardiogram, it is possible to compare the various signals with a normal pattern of waves, and consequently to find out the development of diseases, such as, arrhythmia and myocardial infarction, and the effects of hypertension and pulmonary embolism.

Keywords: electrocardiogram, electrodes, waves, electrical activity, depolarization

MUSCLE ADAPTATIONS TO PHYSICAL EXERCISE AND REGULATION BY THE AUTONOMIC NERVOUS SYSTEM

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Physical exercise is composed of many components, such as aerobic resistance, located muscular resistance and flexibility. Each one of these types of exercise needs various events to occur in the body, both physically and mentally and, for this to happen, we have to consider the overload principle which says that, in order to adapt the body we have to provide enough stress on the contractions that can be isometric or isotonic and increase the intensity of the workout to stimulate those adaptations.

One of the most important structures are the muscle fibers which present several behaviors related to the different types of exercise. There are two types of muscle fibers: type I, which are characterized by being thicker and with a strong, but slow contraction, and type II, which despite being thinner, contract at a greater speed, although do it with less force. The differences between them also consist in the way they capture oxygen and in their resistance to fatigue.

All of these events are regulated, not purposely by the person but by his autonomic nervous system which controls the unconscious changes like our metabolism which is composed by the sympathetic nervous system (is known by activating emergencies and acting in situations of stress) and the parasympathetic nervous system (acts in order to calm down the emergency and reposition of the normal metabolism). For its functioning, acetylcholine is crucial, being a neurotransmitter of the cholinergic system that acts on the cardiovascular, muscular, respiratory and nervous systems, contributing to homeostasis.

Keywords: muscle, nervous system, physical exercise, metabolism, homeostasis

CHRONIC PAIN

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Chronic pain is an unpleasant sensory experience associated with actual or potential tissue damage, which persists for periods longer than three months despite treatment. The causes of chronic pain are varied, examples being: oncological pathologies and their treatment, musculoskeletal and somatosensory diseases, trauma, persistent pain after surgery, among many others.

Chronic pain has effects on an individual's physical and mental health. People with chronic pain most often experience lower back pain, neck and head pain, joint pain, and muscle pain. In the long run, these pains will cause fatigue, insomnia, anxiety, depression, loss of appetite, and loss of interest in sex. Together with mood swings, these repercussions eventually affect people's personal and social lives.

The Gate Control theory is a mechanism that depends on the inhibitory interneurons of the spinal cord that block neurons C and are stimulated by the fibers A β . More than half of the Portuguese population has at least one chronic disease. In Europe, almost 20% of the adult population reports moderate or severe chronic pain.

In 2022 it was estimated that at least 10% of the world's population is affected by chronic pain.

Physical therapists work with people to help them manage pain using various tools, including pain education, coping strategies, problem solving, gradual exposure to exercise, sleep hygiene, and relaxation.

Keywords: chronic pain, persistent, physical and mental health, the gate control theory, physical therapist

