



International Conference of Nutritional Sciences & Dietetics

27-29 May 2022, Thessaloniki, Greece

Venue : Aristotle University Research Dissemination Centre
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Public Health and Toxicology

ABSTRACT BOOK

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Aims and Scope

Public Health and Toxicology (ISSN: 2732-8929) is a double-blind peer-reviewed open access journal. Its primary focus is to assess the interaction between public health and toxicology, including how population data on disease incidence can suggest possible etiologies and how genetic and epigenetic factors can influence risk for adverse health effects. The journal also focuses on the application of how these concepts provide evidence relevant to the understanding and prevention of morbidity and mortality resulting from environmental exposures to toxic substances.

Full Journal Title: Public Health and Toxicology

Abbreviated Title: Public Health Toxicol

ISSN (electronic): 2732-8929

Publisher: European Publishing (www.europeanpublishing.eu)

Publisher Address: Science and Technological Park of Crete, Greece

Peer Review: Double Blind

Publication Frequency: Quarterly

Publication Medium: Electronic Only

Publication website: www.publichealthtoxicology.com

First Year Published: 2021

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How to incorporate sustainability in food-based dietary guidelines?

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Many European countries have incorporated sustainability in their Food-Based Dietary Guidelines (FBDG), or are working on this. Within the European Public Health Nutrition Alliance (EPHNA), countries are sharing experiences on how to do this. The Netherlands and Flanders, both members of the EPHNA, will show how sustainability has been integrated in their FBDG to this point. Basic approaches that can be used to integrate sustainability in FBDG include: use additional advices and rules; demonstrate synergies between health and sustainability; and optimize for both health and sustainability using linear programming. The Netherlands and Flanders will illustrate in detail the process followed for the guidelines for Flanders (the Flemish Food Triangle, an inverted food triangle) and the Netherlands (the Wheel of Five, a plate model). Challenges encountered, communication strategies and tools for consumers and intermediaries will be addressed.

Public Health Toxicol 2022;1(Supplement 1):A1
DOI: 10.18332/pht/149507

Mediterranean diet as a sustainable diet model

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The term “Mediterranean diet” refers to a dietary pattern typical of countries around the Mediterranean Sea, inclusive of seasonal vegetables and fruits, unrefined cereals, nuts, legumes and extra virgin olive oil as primary source of fat. Moreover, it includes a moderate intake of fish, dairy products and a lower to mild eating of meat, eggs, fermented beverages and sweets. A beneficial role of Mediterranean Diet has been shown on physical and mental health, and the risk of cardiovascular, metabolic, cancer and neurodegenerative diseases. In 2010, UNESCO recognized it as an Intangible Cultural Heritage of Humanity, due to either health and environmental impact. Indeed, the ecological footprint is low and products may maintain a greater quantity of vitamins, minerals and other functional compounds, thanks to the consequent short chain food supply, meeting the criteria of *sustainability* and *win-win diets*. These nutritional patterns, geographically characterized, show evidence in the prevention of diet-related non-communicable diseases on one side, with a positive influence on the stability of the Earth system (reduction of greenhouse-gas emissions, pollution, climate change, freshwater and land consumption and biodiversity loss, respectively) on the other.

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Public Health Toxicol 2022;1(Supplement 1):A2
DOI: 10.18332/pht/149532

The five keys for successful management of sarcopenic obesity in young adults

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The interest in the new phenotype termed sarcopenic obesity (SO), which refers to a decrease in muscle mass and strength combined with an increase in body fat deposition – is in growing trend. However, little is still known about this phenomenon in young adults affected by obesity especially in the weight management clinical setting, and therefore still needs further clarification. In the current presentation, we firstly highlight the dilemma surrounding the definition of SO, with our attempt to identify the suitable ones to use in screening for SO, especially in young adults with obesity. Foremost, those who consider body mass (i.e. body weight, body mass index), that have revealed their clinical usefulness. Secondly, we examine the potential association between SO and energy expenditure (i.e. resting and activity physical energy expenditure). Finally, we discuss the relationship between SO and weight management outcomes. Namely, the impact of SO on attrition rate (i.e. dropout), weight loss and weight-loss maintenance during weight management programs.

Public Health Toxicol 2022;1(Supplement 1):A3
DOI: 10.18332/pht/149540

Food systems in the era of the COVID-19 pandemic

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The importance of sustainability in the local food systems, in order to reduce food insecurity, became more obvious due to the ongoing COVID-19 global epidemic. Multiple crises, as those Europe faces in the spring of 2022 not only negatively affect food production and retailing, but also increase the prices and the impoverishment of the poorest families. A local food system is a collaborative network that integrates sustainable food production, processing, distribution, consumption, and waste management in order to enhance the environmental, economic, and social health of a particular area. In order to counteract the crises, we have to improve our perceptions on local food systems and come up with suggestions and interventions that could strengthen local food production

and enhance consumers' appreciation of these foods. The workforce shortages due to the aging of the European farmers; the need to develop entrepreneurship abilities to monitor and adapt to the rules of food demand and supply; to strengthen of urban-rural linkages; and necessary changes in local-food marketing techniques, are among the relevant challenges. The problem concerns not only policy makers but also scientists that are called to improve the effectiveness and sustainability of local food system, in the medium- and long-term.

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Public Health Toxicol 2022;1(Supplement 1):A4

DOI: 10.18332/pht/149542

Nutritional modulation of immune function: Analysis of evidence, mechanisms, and clinical relevance

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The prevalence of allergic diseases is rising dramatically. There is also an increase in other immune-mediated disorders (e.g. autoimmune disease and type 2 diabetes), suggesting a common root cause. The nutrition may have a crucial role in preventing these diseases, collectively referred to as non-communicable diseases. It is also important for the immune system to defend against infection. Immunonutrition can be defined as the study of the direct and indirect effects of nutrients, on immune system development and function. Recently, there has been an increase in understanding that dietary habits may prevent non-communicable diseases and responses to infections. Current research focuses on improvement in understanding interactions between nutrient intake, host microbiome, metabolism, immune systems and disease outcomes. It is also important to understand that nutrient excesses (e.g. high fat, highly processed dietary patterns or over supplementation of nutrients) as well as deficiencies effect immune system function. The 'complicated tango' between nutrients, microbiome, epithelial barriers, metabolism and the immune system may be just as important for disease prevention as for disease treatment. There is a generally accepted consensus, accelerated during the current pandemic, that there is a need to increase our knowledge on the effects of nutrients on the immune system, especially the basic mechanisms and processes underpinning immunonutrition.

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Public Health Toxicol 2022;1(Supplement 1):A5

DOI: 10.18332/pht/149544

Food allergy across Europe: Diagnostic, environmental and nutritional implications

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The epidemiology of food allergy was studied during the first decade of this century in the EU-funded EuroPrevall project. Participating clinical centers were spread out over Europe in twelve countries. The studies included an outpatient clinic survey (>2200 patients), general population surveys amongst school children and amongst adults (cross-sectional), and a general population birth cohort study (longitudinal). Standardized questionnaires and case-record forms, double-blind placebo-controlled food challenges, SPT and ImmunoCAP analyses for 24 foods and 12 inhalants and latex, and component-resolved diagnostic tests for around 65 food allergens were used to map out differences in food allergy across Europe. The biggest impact on differences in the prevalence and spectrum of different food allergies came from differences in pollen exposure, in particular exposure to birch pollen. By far, the highest prevalence was observed for foods associated with Bet v 1 cross-reactivity. Food allergies caused by primary sensitization to food were far less prevalent and seemed in line with differences in dietary habits. Molecular diagnosis provided clear insights into sources of sensitization and models based on combinations of molecular diagnosis, demographics and clinical history proved to be promising predictors of the risk of severe reactions to food. The EuroPrevall project has provided many leads to improve the management of food allergy across Europe.

Public Health Toxicol 2022;1(Supplement 1):A6

DOI: 10.18332/pht/149547

Fighting food allergy by inducing tolerance

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In order to understand how we can fight allergy by inducing tolerance, one should first realize the mechanisms by which tolerance is built and how allergy results from an inadequate or failed tolerance induction. Failed tolerance is a core mechanism in the development of clinical allergy, which is the expression of imbalanced immunity, leading to or being associated with one or more instances of broken tolerance. Tolerance is a basic immunological mechanism, by which the immune system chooses not to respond to a particular antigen, either because this is a self-antigen or because it is harmless for the host. The development of tolerance starts before birth, with recognition and deletion of self-reacting immune cells and continues in the infant through recognition of antigens

which do not possess danger signals. While, tolerance is an active process, i.e. the presence of the antigen is necessary, it is directed to a large extent by external, environmental signals present at the time of the antigen encounter.

Tolerance is the natural fate of proteins in non-allergic individuals. Even when tolerance has been broken and therefore an allergy has manifested clinically, it is possible for tolerance to be restored, either naturally, as often happens in allergens such as milk or eggs, or through guided exposure – in the context of what is called ‘Allergen Immunotherapy’ (AIT). There are several different types of immunotherapies depending e.g. on the route of antigen provision (subcutaneous, sublingual, oral, epicutaneous, etc.), but also on a large number of protocols, allergen modifications and adjuvants. While the main success of AIT lies with respiratory allergies (rhinitis or asthma), in the last few years there have been many attempts to use it for the treatment of food allergy, mostly through the oral route (oral immunotherapy). Most of these protocols remain semi-experimental – used mainly in a small number of patients in specialized centers. Nevertheless, we have recently seen the first standardized product to enter the market, becoming available in some countries. Tolerance induction is actively researched, has already changed the life of many patients and is even more promising for the future.

Public Health Toxicol 2022;1(Supplement 1):A7
DOI: 10.18332/pht/149548

Personalized nutrition through DNA analysis

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Despite being phenotypically quite diverse, humans are genetically mostly the same, with two individuals differing by <1% in their genomes on average. Precision nutrition, sometimes called personalized nutrition, or nutrigenetics, is when individuals receive diets tailored to their personal genetic make-up. The most widespread, inexpensive form of genetic testing is the DNA microarray (Genome-wide association studies: GWAs) containing probes that can quickly detect genotypes at hundreds of thousands of SNPs across the genome. GWAs have discovered many genetic variants associated with specific nutrition-related traits, that in turn can result in gene–diet interactions and human diseases. Together, these findings raise the critical question of whether dietary recommendations could be tailored to individuals based on genetic variation and how significant the impact of precision nutrition could be in contrast to conventional recommendations. A growing number of companies now offer direct-to-consumer, genetically-based nutritional testing (DTC-GT) and advice. However, precision nutrition is at a very early stage, especially given the low prediction of variation and the complexity of genetic alterations. The recent development of polygenic risk scores in combination with lifestyle scores improved our tools to assess in a holistic way personalized nutritional recommendations based on the DNA variation.

Public Health Toxicol 2022;1(Supplement 1):A8
DOI: 10.18332/pht/149549

The first 1000 days: The role of nutrition during pregnancy and infancy in the prevention of cardiovascular disease

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The Developmental Origin of Health and Disease (DOHaD) theory, first proposed as the ‘Barker Hypothesis’, is based

on the concept that the origins of lifestyle-related disease, i.e. cardiovascular disease, obesity, type 2 diabetes etc., are formed at the time of fertilization, embryonic, fetal, and neonatal stages, by the interrelation between genes and the environments. Nutrition, either over- or hypo-nutrition, affects profoundly the risk of lifestyle-related adult diseases. Importantly, micro and macro nutrients can influence the offspring risk of disease. They act mainly via epigenetics mechanisms that induce programming of pivotal metabolic organs, i.e. the central nervous system. They also influence the health status modulating the gut microbiota that in turn release a number of moieties that serve as key modulators in metabolic pathways.

Nutrients influence also the individual’s inflammatory and redox balance during this window of plastic opportunity.

Improving early life environments can reduce non-communicable disease risks and improve health over the life course. A widespread understanding of this evidence may help to reshape structures, guidelines and individual behaviors to better the developmental conditions for the next generations. Yet, translation of the DOHaD concept beyond the research community must be an imperative for healthcare providers and policy makers.

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Public Health Toxicol 2022;1(Supplement 1):A9
DOI: 10.18332/pht/149550

Challenges of nutrition policy in the frame of F2F European Strategy

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Launching of F2F Strategy by EU Commission May 2020 set a number of challenges both to agri-food value chain and related stakeholders. F2F Strategy is part of European Green Deal.

The challenges we are discussing in this presentation are related to the actions aiming to healthier and sustainable nutrition.

We refer to nutrition improvement action taken by Food Operators in Greece and across EU since 2007 and action carrying out today.

We discuss the ‘one-side approach’ taken by EU Commission, focusing only on nutrition labelling rules, allowing broader communication plans out of public consultation, discussing food operators concerns, and the effectiveness of such an approach.

Additionally, we comment on recent scientific publication trends under the umbrella of Ultra Processed Foods, the scientific validation of used classification system, and their real contribution to prevention of non-transmissible diseases throw nutrition.

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Public Health Toxicol 2022;1(Supplement 1):A10
DOI: 10.18332/pht/149551

From food safety to prevention of chronic diseases: The role of the Hellenic Food Authority

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The Hellenic Food Authority (EFET, <https://www.efet.gr>) is the central authority responsible for food safety after primary production. The responsibilities of EFET are varied and concern the definition of food quality standards and rules of good hygiene practice, the preparation and approval of training programs for people working in the food industry and the maintenance of a register for companies in the field of food production and management, the definition, implementation and coordination of food control programs (including materials in contact with foods such as food packages), the elaboration of exploratory programs and studies, the participation in the International and European regulatory bodies, the suggestion of proposals for the adoption of legislative and other measures relevant to food safety and continuous information of consumers. The audits carried out are relevant to regular inspections, complaints, food incidents/RASFF, as well as re-inspections for food safety, quality, authenticity, and labeling. In addition to the chemical and microbiological risks, EFET has taken actions to reduce nutritional risks such as increased salt consumption and trans fatty acids. Specifically, it has developed the Salt Reduction Strategy which has been adopted by the Ministry of Health and includes 4 main pillars, while it has undertaken actions at both national and European level with the aim of eliminating industrially produced trans fatty acids. Other actions relevant to nutrition include the definition of maximum levels of vitamins and minerals in fortified foods as well as nutritional frontal labeling in foods as part of the Farm-to-Fork strategy. EFET is the focal point in Greece of EFSA, Codex Alimentarius, INFOSAN and the Food Fraud Network. Regarding the actions in the field of fraudulent practices and fraud, EFET systematically carries out inspections on products of national importance such as olive oil, feta cheese, and honey.

Public Health Toxicol 2022;1(Supplement 1):A11
DOI: 10.18332/pht/149552

Farm-to-Fork Strategy and other EU and WHO policies on sustainability

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Sustainable dietary patterns are those that promote health and wellbeing at all life stages for present and future generations, while at the same time have low environmental impact. The sustainability of food systems is a global issue and food systems will have to adapt to face diverse challenges. The European Union's Farm-to-Fork Strategy, published on May 2020, addresses the challenges of sustainable food systems and recognizes the link between healthy people, healthy societies and healthy environment. The goals of the Strategy are:

1. To ensure that the food chain (from food production, transport, distribution, marketing till consumption), has a neutral or positive environmental impact;

2. To reduce food loss and food waste;
3. To ensure that every citizen in the EU has access to sufficient and nutritious food; and;
4. To ensure that ultimately the most sustainable food also becomes the most affordable.

Actions include new legislative proposals and revision of current legislation, as well as non-legislative actions such as codes of conduct. As part of the Strategy, the European Commission proceeds in revision of EU rules regarding food labelling, in order to help consumers make healthier and more sustainable food choices.

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Public Health Toxicol 2022;1(Supplement 1):A12
DOI: 10.18332/pht/149523

Dietitian as a key professional to facilitate transition towards sustainable food systems

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Evidence suggests that plant-based diets, such as the traditional Mediterranean diet, can benefit both health and the environment when compared to the typical Western diet. However, sustainable diets have been criticized for being unaffordable for many people and for the risk of not meeting the nutritional needs of vulnerable groups. The transition towards healthier and more sustainable dietary patterns should not only pursue a greater presence of fresh and minimally processed foods, but also the reduction of unhealthy foods intake, minimize food waste, increase food literacy, etc. To facilitate this transition, health professionals must be trained in sustainable diets within the complexity of food systems, and local, national and regional authorities should assess the impact of their policies on people's and the planet's health. European dietitians can play a crucial role in facilitating this transition. The EFAD's position paper on Sustainable Dietary Patterns supports the commitment and willingness of European dietitians to promote affordable, nutritious and diversified eating patterns, while being less dependent on limited natural resources. We must leverage the momentum provided by EU policies such as the Farm-to-Fork Strategy which frames the actions that support, facilitate and lead the transition towards healthier and more sustainable food systems.

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Public Health Toxicol 2022;1(Supplement 1):A13
DOI: 10.18332/pht/149531

Policies for healthy, sustainable diets: Creating enabling food environments

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Food systems encompass a wide range of activities that impact, both positively and negatively, on different health dimensions and disease risk factors. While nutrition stands out as food's single most important health impact, other factors co-define the relationship between food and health, including food safety, antimicrobial resistance (AMR), climate change, socioeconomic conditions, air quality, zoonotic diseases, and exposure to agrochemicals.

Two years ago, the European Union's Farm-to-Fork Strategy for a fair, healthy and environmentally friendly food system was introduced. This strategy represents the most coherent and comprehensive attempt yet to respond to the fundamental challenges posed by today's food systems.

This presentation will set out the main interlinkages between food systems and public health, discuss key ongoing policy developments at the EU level, and will reflect on how the creation of enabling food environments¹ will be critical for advancing healthy, sustainable diets in Europe.

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Public Health Toxicol 2022;1(Supplement 1):A14
DOI: 10.18332/pht/149541

Food-Based Dietary Guidelines (FBDGs): How European FBDGs can promote sustainable dietary patterns?

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Food-Based Dietary Guidelines (FBDGs) are an ideal tool to promote sustainable dietary patterns around Europe. Some best practice examples include: the guidelines of Flanders, where there is a clear reference that a mainly plant-based diet with seasonal foods has a reduced impact on the environment. Seasonality and locality of food produce and especially fruits and vegetables are also promoted in FBDGs of Bulgaria, Ireland, Greece, Spain, Croatia, Latvia, Lithuania, Luxemburg, Austria, Portugal, Norway, and Slovenia. Moreover, guidelines urge citizens to avoid food waste and moderate their consumption in various European countries such as Belgium, Denmark, Switzerland, Estonia, and Iceland. Further details on environmental impact (e.g. water footprint) are included in various food groups in the Flemish FBDGs, while fish or

poultry production sustainability are distinctly referred in FBDGs of Germany, where there is also reference to fair trade, the Netherlands and the United Kingdom. Finally, organic products are included in the guidelines of France, Sweden, and Slovakia. In Finland, weight control is advisable for sustainability reasons as well, because overweight people have greater energy needs than normal weight people. Increasing the consumption of vegetables, root vegetables, potatoes, berries, fruits and cereals (excluding rice) is also advised because it reduces the impact on climate and eutrophication. Rapeseed oil, margarines and olive oil also have lower impact on the climate than butter.

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Public Health Toxicol 2022;1(Supplement 1):A15
DOI: 10.18332/pht/149543

Artificial intelligence and machine learning for objective intake monitoring

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Introduction

The progress in artificial intelligence and machine learning during the last decade has enabled the development of new and improved intake monitoring methods. Specifically, sensor-based objective monitoring has the potential to provide more accurate intake indicators compared to questionnaires, but can also provide detailed in-meal intake parameters that today are available only through time consuming, video-based manual annotations.

Aim

This presentation aims at providing an overview of our work on objective intake monitoring.

Methods

We present two types of methods, one based on commercially-available smartwatches and one based on a prototype ear-worn chewing sensor. Smartwatch-based methods take advantage of the inertial sensors (triaxial accelerometer and gyroscope) available in modern smartwatches to detect intake gestures. It is shown that although individual movements are not sufficient to detect intake, modelling sequences of movements leads to accurate detection. For the chewing sensor, we evaluate an in-ear microphone as well as a photoplethysmography sensor for chewing detection.

Results

We present results on several annotated datasets. The smartwatch-based intake monitoring methods achieve an accuracy of F1 score of 0.92 for detection of intake cycles

and 0.96 for meals. Chewing sensor methods achieve 0.96 weighted accuracy and 0.91 F1 score for meal detection.

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Public Health Toxicol 2022;1(Supplement 1):A16
DOI: 10.18332/pht/149545

An open nutrition informatics e-framework for education and research

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Academic education and research within Nutritional Sciences is increasingly based on a digital toolkit, comprised of various apps, web platforms, data processing activities and electronic databases. While Information and Communication Technologies (ICT) have allowed for rapid advances and novel education and research approaches, the heterogeneity of ICT components used – most of which evolved through the digitization of traditional tools and best practices – has created a fragmented environment where digital workflows are easily disconnected.

The open Nutrition Informatics e-framework (ONIF) is designed to harmonize the data, tools, processes and best practices needed for efficient nutrition academic education and research, providing an open and extensible platform for students and researchers alike. ONIF provides a digital framework for reusable solutions to common processes such as nutritional analysis and diet plan generation and visualization, using open-source data and FAIR principles (Findability, Accessibility, Interoperability, Reuse). Provenance information and extensive metadata are attached to every input, processing and export stage, in order to facilitate reuse and evaluate data quality and fitness for purpose. Using a common data model based on ontologies, ONIF provides both human- and machine-understandable interfaces in the form of a Web-based platform and APIs, respectively, promoting interoperability. The framework is currently under active development, in collaboration with academic and education research stakeholders.

Public Health Toxicol 2022;1(Supplement 1):A17
DOI: 10.18332/pht/149553

Social media and dietetics: Opportunities, challenges and best practices

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We live in an era where the transition to online life is a reality. In this context, the communication tactics of all health professions, but also of the dietitian in particular are modified. The dietitian's communication skills are the cornerstone of a successful career. One of the most important things to remember in this area is that communication is not limited to publishing information, that is, simply informing. In this new context of communication, social media (SM) are playing a crucial role. The number of customers getting informed by SM is growing.

SM provide to dietitians a smart way to promote their work. Although they have several negative dimensions, they are still a great opportunity for the dietitian to communicate nutritional messages, to correct misconceptions, to speak/communicate directly and quickly with the public. In order to formulate an effective communication policy, it is initially important to identify two parameters: 1) The audience we are addressing (age, geography, interests), and 2) What is our goal. Also, the definition of content, the human-centered approach and the way of interaction define the framework of a successful social media communication policy.

Public Health Toxicol 2022;1(Supplement 1):A18
DOI: 10.18332/pht/149555

mHealth nutrition apps in dietary assessment

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Conventional dietary assessment methods rely heavily on self-reporting and are prone to errors. Thus, there is a growing need for more specific and accurate dietary assessment methods. Due to the technological proliferation, image-based smartphone apps with intelligent features, which may improve dietary assessment, have been developed. However, there is room for improvement in the field of mHealth due to the lack of validation and robust scientific work behind the use of such systems. Moreover, when using image-based nutrition apps, a large number of pictures (approx. 12%) is discarded due to human errors made in the capturing procedure. Trials should be conducted under free-living conditions and mHealth solutions should be compared with conventional ones. Collaboration of multidisciplinary teams is of vital importance and especially the needs of healthcare professionals and end-user should be taken into account when designing and developing nutrition apps.

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Public Health Toxicol 2022;1(Supplement 1):A19
DOI: 10.18332/pht/149556

Immunity, cognition and diet

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The connection between diet and cognitive function occurs from intrauterine life. Nutrition also impacts the immune system, as priming of the adaptive immune response towards an antigen may depend on metabolic factors. The key aspect is represented by the presence of microbiota-gut-brain axis. The bidirectional communication between the microbial community dwelling in the gut (gut microbiota) and the brain occurs through various pathways including the vagus nerve, the immune system, neuroendocrine pathways and bacterial derived metabolites. The gut microbiota exerts numerous functions for gut homeostasis and host health, such as metabolism of undigested nutrients, supply of beneficial microbial metabolites, defence against enteric pathogens and maturation of the immune system. Nutrients and microbial products pass through the intestinal epithelial barrier where they participate in enterocytes' physiology and drive the behavior of immune cells. The microbiota-gut-brain axis is involved in neurodegeneration, by affecting, thus, several aspects of health regarding energy metabolism, immune system and neuronal function. Numerous factors have been highlighted to influence gut microbiota composition, including diet composition and nutritional status that are modifiable factors. Optimal nutritional status and healthy gut microbiota are crucial for maintaining brain health. Unbalanced dietary patterns may affect the microbial community and, as a consequence, may affect brain physiology and its predisposition to neurodegenerative diseases.

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Public Health Toxicol 2022;1(Supplement 1):A20
DOI: 10.18332/pht/149557

Natural products against neurodegenerative disease progression

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Dementia is a rising health problem that affects more than 50 million people worldwide. Current pharmacological options are unable to effectively treat dementia and can cause adverse effects. Secondary prevention of dementia has targeted pre-dementia stages such as Mild Cognitive Impairment (MCI). Natural products have been suggested for the prevention of dementia and have shown promising results. We present key randomized clinical trials (RCT) of interventions with natural products in MCI and their neuroprotective properties. Pomegranate juice and its effects on memory and cognition has been studied in a double-blinded, placebo-controlled RCT with 200 participants aged 50–75 years with age related normal cognitive performance or MCI. The results showed statistically significant decline of visual memory in the placebo group whereas the intervention group maintained their cognitive abilities¹. Ellagic acid can be found in various vegetables, fruits, nuts, and berries, and has been shown to have anti-inflammatory, and antioxidant activity. Its neurocognitive properties have been studied in a double-blinded RCT with 150 male participants aged 45–55 years having normal weight or being overweight. Cognitive performance improved statistically significantly in overweight participants consuming ellagic acid but no difference was observed in normal weight participants². Rosemary is known for its use in folk medicine. There are two clinical studies with promising results^{3,4}. Extra virgin olive oil was used in clinical trials for healthy elderly but also for patients with MCI with very good results in cognition⁵. Turmeric, baicalein, huperzine A, resveratrol, rifampicin, berberine, betaine, epigallocatechin-3-gallate, catechin, caffeine, docosahexaenoic acid, cinnamon, luteolin, bryostatin-1, ginger, genipin and saffron are used in clinical trials with different results. Perhaps Hippocrates saying that 'our food is our medicine, and our medicine is our food' was right after all.

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Public Health Toxicol 2022;1(Supplement 1):A21
DOI: 10.18332/pht/149558

Gut-brain axis: Feeding your brain through your gut – the link with stress and depression

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The gut microbiota (the community of microorganisms throughout the gastrointestinal tract) has been recently associated with symptoms of anxiety and depressive disorders leading to significant research interest. This presentation will focus on the findings of recent related studies that attempt to elucidate the pathopsychological mechanisms that are implicated and propose directions for future research.

Public Health Toxicol 2022;1(Supplement 1):A22
DOI: 10.18332/pht/149564

Dietary patterns to slow cognitive decline

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Background

As the population is ageing, the prevalence of dementia is expected to increase with huge burdens on individuals and society. Nutrition is a modifiable risk factor with both direct and indirect effects on the risk of dementia^{1,2}.

Methods

A review of the evidence on dietary patterns and interventions associated with a reduced cognitive decline will be presented.

Results

Higher adherence to dietary patterns such as the Mediterranean and MIND diets have been associated with a reduced cognitive decline in various populations³⁻⁵. Emerging evidence suggests that multicomponent interventions such as those used in the FINGER study⁶ result in improvement of cognitive outcomes in older individuals. A number of mechanisms linking nutrition and cognitive outcomes such as reduction in inflammation and oxidation, changes in gut microbiota profile and reduction in comorbidities have been suggested^{7,8}. Dietary recommendations aiming to reduce cognitive decline of the ageing brain are available⁹.

Conclusions

Healthy dietary patterns provide a valuable means to slow cognitive decline especially within a multidisciplinary approach. Further research to better understand the timing, duration and content of interventions is necessary.

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Public Health Toxicol 2022;1(Supplement 1):A23
DOI: 10.18332/pht/149565

Fish allergy in children

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Food allergy, an adverse reaction to foods or food additives, affects around 5% of adults and 8% of children. Fish allergy is seen in 0.2% to 2.29% in the general population, and it differs according to regional dietary habits, fish species exposure and way of preparation and cooking. In children, it can represent a severe problem worldwide, and the prevalence has been reported between 0% and 7% worldwide. The clinical characteristics vary depending on the type of allergy (IgE-mediated or non-IgE-mediated) and range from mild symptoms to life-threatening anaphylaxis. Parvalbumins, enolases and aldolases are present in fish muscles, with the first being the major culprit allergen. A large cross-reactivity between different species of fish has been demonstrated. The protein β -parvalbumin, considered a pan-allergen, is found in bony fish, while the non-allergenic α -parvalbumin is commonly found in cartilaginous fish. Based on this difference, as a first step in the therapeutic process of children with fish allergy caused by a certain fish in the bony fish category (i.e. hake, cod, perch, sardine, gilthead sea bream, red mullet, sole, megrim, sea bass, anchovy, tuna, swordfish, trout, etc.), an oral food challenge to an alternative from the category of cartilaginous fish is suggested (i.e. blue shark, tope shark, dogfish, monkfish, skate, and ray).

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Public Health Toxicol 2022;1(Supplement 1):A24
DOI: 10.18332/pht/149567

Essential fatty acids: From fish to human nutrition

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The beneficial effects of long-chain omega-3 PUFAs (LC n-3 PUFAs), namely eicosapentaenoic acid (20:5n-3, EPA) and docosahexaenoic acid (22:6n-3, DHA) in human health have been thoroughly studied in recent decades¹. Fish have traditionally been the main source of these nutrients for humans. Differences can be found between fish species both in their fat content as well as in their fatty acid profile. The latter is affected by several factors with the fish feed being the main one so that the fatty acid profile of the fish tissues typically reflects that of the fish diet². Moreover, fish themselves need adequate essential fatty acids in their diets for their own optimal growth and robustness³. With global fisheries production being relatively stable, aquaculture contributes significantly to fulfill the increasing demand for fish and seafood⁴, and hence to provide sufficient omega-3 LC-PUFA to a growing human population⁵. The use of novel omega-3 sources like microalgae, can further contribute to the efficient production of nutritious and sustainable aquaculture products.

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Public Health Toxicol 2022;1(Supplement 1):A25
DOI: 10.18332/pht/149568

Edible land and sea snails as sources of protein and other important nutrients

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Edible species of marine, aquatic and terrestrial snails (Phylum Mollusca, Class Gastropoda) are consumed by humans since prehistoric times. Wild populations of snails are collected, while land snails are also farmed. Snails are cooked and served by multiple traditional recipes in many parts of the world, including France, Greece, and Turkey, as they are considered a delicacy and part of the Mediterranean diet. Snail meat is considered a nutritious protein-based food with a balanced amino acid profile. It is low in fat and cholesterol content, while the fat fraction is rich in unsaturated lipids. Snail meat is also a good source of minerals and trace elements, such as Ca, K, Mg, Fe, P and Se. Snails have attracted attention due to their content in anti-inflammatory, anticancer, and antimicrobial bioactive compounds. However, little research has been conducted regarding snail meat protein digestibility, functional properties, and methods of increasing the bioavailability of its nutrients. Given the frequent consumption of snails, their nutritional value and nutrient absorption should be further studied.

Acknowledgements

The authors would like to thank Hellenic Foundation for Research and Innovation (HFRI) and the General Secretariat for Research and Innovation (GSRI) for funding.

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Public Health Toxicol 2022;1(Supplement 1):A26
DOI: 10.18332/pht/149611

Insects: An alternative for fish and human nutrition

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Insect larvae meals are considered a very promising alternative to provide valuable proteins for aqua feeds¹ and food². Insects are highly nutritious, convert feed efficiently to body mass, can be grown on organic side-streams and agricultural by-products, whereas their rearing is described by low water and land requirements and reduced gas emissions³. The European Commission approved the use of processed animal protein from seven insects in feeds for aquaculture and their use is expected to dramatically increase⁴. Although high levels of insect larvae meal inclusion in fish feeds could lead to a slight decrease of juvenile fish performances, recent studies reported positive results in gilthead sea bream (*Sparus aurata*)⁵ and

in crustaceans⁶. Feeding on selected substrates exerted an impact on the nutrient composition of *Tenebrio molitor* larvae, with a high protein content of the substrate usually resulting in a high protein content of the larvae⁷. Further research is needed to gain knowledge regarding its use as an insect-based protein provider for feed and food.

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Public Health Toxicol 2022;1(Supplement 1):A27

DOI: 10.18332/pht/149612

Farmed versus wild fish fillets: What are the differences?

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Wild fish refers to the caught fish and other living organisms from the wild (sea, ocean, lake) aiming to be consumed as seafood. Farmed fish (aquaculture) refers to the controlled process of cultivating aquatic organisms. Seafood (fish and other aquatic organisms) is considered desirable in the human diet. Seafood contains an important source of protein and essential elements for healthy human nutrition. A myth about captured fish and farmed fish is that wild fish are generally assumed to be healthier than farmed fish.

Basic truths are: 1) the nutritional benefits of farmed fish are almost equal to wild fish; 2) the lipid composition of farmed fish is more constant being independent of seasons; 3) the farmed fish are rich in EPA, DHA, and omega-3; 4) farmed fish have less risk of heavy metal or microplastic contamination; and 5) farmed fish are more ethically produced concerning slaughtering methods.

Provided that aquaculture is performed under appropriate conditions, the nutritional content of farmed fish would not be different from that of wild fish. Cultured fish have the

advantages of humane slaughter and apparent non-toxicity. Farmed fish are under an erroneous impression, thus the consumer perception needs correction through the expansion of scientific information.

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Public Health Toxicol 2022;1(Supplement 1):A28

DOI: 10.18332/pht/149615

Plant-based imitation of meat products: How informed is the consumer?

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Fossil evidence suggest that animal meat and marrow were incorporated into human diets in early stone age. This was a major evolutionary step because meat and marrow are rich in energy yield, essential amino acids and micronutrients. Such dietary change supported the transformation of body size in ancestral lineage, which gave rise to modern humans. Lately, we notice a growing trend accompanied with considerable investments in plant-based foods imitating meat and meat products. It is a major challenge for animal production worldwide. Our intention here is to ensure that consumers are well informed about the processing of plant-based products and that their labelling and marketing practices are transparent. We review the available literature to assess objectively the profile of these plant-based meat alternatives and focus on consumers studies to assess how much informed they are since this change in the diet could become another evolutionary change with unknown consequences. The literature reveals promising scenarios regarding plant-based pilot products in the market, but without verifiable evidence regarding environmental consequences of large-scale production. We conclude that there is scarce evidence of health implications for consumers. The whole issue should be viewed in the broader context of global farming communities and their sustainability.

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Public Health Toxicol 2022;1(Supplement 1):A29
DOI: 10.18332/pht/149616

Nutritional compounds: Antioxidants with putative prooxidant action

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Free radicals, and reactive species (RS) in general, are abundant in living organisms and contribute to a plethora of both beneficial and harmful biological procedures. A shift regarding the biological function of RS has been observed in the field of Redox Biology. Indeed, RS induce oxidative modifications in biomolecules at the subcellular level, thus they are thought to play key roles in the onset of the redox-related ailments¹. Concurrently, they appear to be necessary for normal cellular function promoting redox signalling². The dual action of RS, whose function follows the hermetic theory³ dictates a similar two-fold biological role for antioxidants^{4,5}. Antioxidants become available in humans mainly via their diet. Nutritional antioxidants are referred to polyphenolic compounds mostly, which may exert both protective (i.e. antioxidant) and prooxidant action, thus their advantageous clinical effects are challenged today⁶. Factors such as the dosage (i.e. hermetic effect) of nutritional compounds, the presence of metal ions or the highly reducing environment of cells are key determinants for their Janus-faced action at the cellular and the organismal level.

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Public Health Toxicol 2022;1(Supplement 1):A30
DOI: 10.18332/pht/149617

Debate: The pros and cons of food supplements

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Introduction

Dietary supplements include vitamins, minerals, trace minerals, probiotics, prebiotics, herbal extracts, enzymes, protein, and amino acids. They come in many forms such as capsules, tablets, powders, liquids, gummies, and recently as oral sprays for a better bioavailability. Dietary supplement labels may include certain types of health-related claims approved by the EFSA. Many people take dietary supplements to fill in the nutritional gaps in their diet. Some supplementation has also become an accepted part of modern healthcare practices. This includes, for example, the role of calcium and vitamin D supplements in maintaining healthy bone density and the role of folic acid supplements in preventing certain birth defects. Also, the involvement of the immune system in the COVID-19 era opened the opportunity for the use of nutritional supplements with antimicrobial and immunomodulatory activity. The number and quality of studies on dietary supplements is a little bit uneven. Many existing studies are observational, without any control groups. This could make the findings questionable. RCTs often generate results that are totally different from those of observational studies. Certain supplements, like magnesium and vitamin D, have enjoyed being the subject of much research, so there is a lot more hard data available to analyze on those. Other supplements do not have many studies backing them, so there are still question marks about their effectiveness. In the debate, E. Zoumbaneas takes a stand challenging the need for additional nutritional preparations while K. Xenos defends the need for the use of specialized dietary supplements, under specific conditions.

Discussion

The decision on the necessity of dietary supplements should be taken by the healthcare providers based on the individual's overall health and lifestyle.

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Public Health Toxicol 2022;1(Supplement 1):A31
DOI: 10.18332/pht/149675

Exercise, health and quality of life: An evolutionary perspective

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Body movement, as a result of muscular function, has been a key element in human evolution. Thanks to body movement, early humans were able to feed themselves, to protect their young, or to travel to more secure residences. However,

to accomplish the aforementioned, humans had also to be healthy. This harmonic co-existence between health and body movement (exercise) is actually known since antiquity, while contemporary science has repeatedly confirmed their association by identifying numerous biological functions which link them. In contrast, we know of no biological mechanism capable of combating the endemic hypo-activity of the industrialized world. Recent reports highlight the need to increase elements of health-related fitness; our urban lifestyle has negatively affected activity levels and increased cases of morbidity and mortality from infectious and non-communicable disease.

Public Health Toxicol 2022;1(Supplement 1):A32
DOI: 10.18332/pht/149676

The vision 'Exercise for all'

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Exercise and physical activity are often confused with one another, and these terms are sometimes used interchangeably. Physical activity is any movement carried out by the muscles and requires energy. Exercise differs from physical activity as it is a planned, structured, repetitive, and intentional physical activity, which has the objective to improve or maintain physical fitness. Implementation of the exercise-specific rules dictates understanding the components of frequency, intensity, time, and type of exercise (F.I.T.T.) principle, on which an exercise workout is planned. Both exercise and physical activity affect physiological and psycho-emotional aspects of human behavior. Many studies suggest that exercise may increase life expectancy and the overall quality of life; it maintains physical fitness and can contribute to the maintenance of a healthy weight, building and maintaining healthy bone density, muscle strength, and joint mobility, promoting well-being, reducing surgical risks, and strengthening the immune system. Indeed, regular physical activity/exercise helps to reduce the risk of chronic conditions like type 2 diabetes, cardiovascular disease, many types of cancer, depression, anxiety, and dementia. Conversely, being physically inactive is associated with increased risk of chronic diseases, not only in adults but also in children and adolescents.

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Public Health Toxicol 2022;1(Supplement 1):A33
DOI: 10.18332/pht/149677

The vision 'Exercise is Medicine'

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The vision 'Exercise is Medicine' aims to introduce physical exercise in the health system and to refer patients to participate, based on specific indications, in specialized exercise programs, which are documented for their benefit.

The introduction of the proposal 'Exercise is Medicine' can be achieved through synergies between all branches of health and exercise sciences, health system institutions and society. This would lead to the establishment of a relationship of trust that would focus on the coordinated care of clinical populations, with a final aim being the implementation of non-pharmacological interventions for the prevention and treatment of chronic diseases. The adoption of 'Public Health Management' strategies by those in charge of the health system can promote the proposal 'Exercise is Medicine' as part of innovative initiatives for the benefit of patients and society, leading to the establishment of physical exercise as an integral part of healthcare. The promotion to the Greek population of the scientifically confirmed health benefits of physical exercise, to prevent diseases and contribute to their treatment, will lead to the improvement of public health and to the reduction of health costs for Greek citizens.

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Public Health Toxicol 2022;1(Supplement 1):A34
DOI: 10.18332/pht/149678

Impact of COVID-19 lockdown on physical activity in a sample of Greek adults

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This study compared physical activity (PA), i.e. daily employment, transfer to and from daily employment, leisure activities, and regular sports activities, before (PRE) and during (POST) the ongoing COVID-19 epidemic in the lockdown environment in Greece. A Greek version of the Active-Q online questionnaire was used to assess the PA. The questionnaire was completed twice (PRE and POST) by 8495 participants (aged 37.2 ± 0.2 years; men 38.3% and women 61.7%). The relative frequency of total sports activities and overall participation in competitive sports decreased significantly (8.6% and 84.7%, respectively). Activities decreased significantly (p<0.05). Total PA decreased in all sexes, age, body mass index (BMI) and PA level subgroups in the POST state and an interaction was observed between men and the high PA subgroups. The change in total PA (from PRE to POST conditions) was -16.3%, while in daily employment, in transport, and sports activities, it was -52.9%, -41.1% and -23.9%, respectively. Thus, the lockdown period is largely associated with a negative change in overall PA. During the lockdown, inactivity increased dramatically, with men and the high PA population being significantly more affected. Thus, the lockdown period is highly associated with a negative change in overall PA.

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Public Health Toxicol 2022;1(Supplement 1):A35
DOI: 10.18332/pht/149681

Dietary factors affecting respiratory health: The COVID-19 paradigm

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SARS-CoV-2 expanded worldwide since December 2019, and COVID-19 has emerged with many unknown facets. The evidence suggest that COVID-19 is a multisystem disorder, affecting ubiquitous targets, in which oxidative stress and inflammatory process play relevant roles. The lack of a specific antiviral therapy had led to the situation of finding supportive alternatives to prevent or to treat COVID-19.

Previous research suggested the role of vitamin supplementation to attenuate the severity of respiratory infections and to augment the immune system via antioxidant properties, in order to prevent the development of severe forms. Vitamin C acts as a potent antioxidant and restores the level of others, improving the immune functions. Its low level correlates with respiratory infections, including COVID-19 and its supplementation ameliorates the symptoms and shortens the duration of infections. Vitamin D activates the immune response reducing the risk and severity of respiratory infections in patients with low plasmatic level, but its preventive role in healthy people is not well established. Recent data show higher levels of vitamin D during the pandemic versus pre-pandemic, probably due to a lower demand for it in immunomodulatory processes. Dietary interventions may represent an add-on strategy in preventing and treating respiratory infections, including COVID-19.

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Public Health Toxicol 2022;1(Supplement 1):A36
DOI: 10.18332/pht/149682

Electrolyte disorders in acutely ill children: Pediatricians, mothers or climate change, who is to blame?

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Circulating sodium abnormalities are associated with an increased risk of morbidity and mortality in patients requiring emergency care. In children with acute gastroenteritis, a major cause of visits in the pediatric emergency department, dysnatremias are observed in one of two cases. Despite common both in infants and adults, the underlying causes of sodium abnormalities in these two age groups are different in most cases. Until the 1980s, hypernatremia was very frequent and hyponatremia uncommon in pediatric subjects affected by acute gastroenteritis. In the following years, hypernatremia almost disappeared, and the prevalence of hyponatremia increased. It is assumed that the resurgence of breastfeeding, formulas having less salt, and early and fast reintroduction of mostly hypotonic fluids, account for this change. New data suggest that climate change could also be a contributing factor. On the other hand, recently published observations point out that hyponatremia might be significantly more frequent in infants affected by bronchiolitis and pyelonephritis than in acute gastroenteritis. The different pathogenetic mechanisms underlying dysnatremia in these conditions have relevant consequences for the nutrition and rehydration management. This talk will deal with these issues and briefly address the approach to acutely ill infants presenting electrolyte imbalances.

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Public Health Toxicol 2022;1(Supplement 1):A37
DOI: 10.18332/pht/149683

Immunology of eosinophilic esophagitis: Clues to the solution of a mystery

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Eosinophilic esophagitis (EoE) is a chronic inflammatory disease of the esophagus. EoE's main symptoms in infants are vomiting, failure to thrive and food refusal, in school-age children difficulty in swallowing, vomiting and food impaction, while heartburn and chest pain are the main symptoms in puberty and adulthood¹. The clinical experience has connected EoE to causative foods, different for each patient. EoE is related to atopic diseases such as IgE-mediated food allergy. The results of in vitro and in vivo food allergy tests have been used to design 'tailored-made' diets for the treatment of EoE. However, this dietary approach was not shown to be more efficient than other dietary strategies, based on the use of elemental formulas, or on the empiric elimination of foods². The immunological paradox of EoE connection to causative foods and to the concomitant allergic diseases, without a direct IgE-mediated mechanism, is not completely cleared. The activation of T cells with TH-2 cytokines noticed in EoE can be a systemic phenomenon that downregulates the esophageal barrier³. The increased permeability of esophagus is leading to the establishment of sensitization to food allergens, explaining the connection of EoE exacerbation to their dietary reintroduction.

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Public Health Toxicol 2022;1(Supplement 1):A38

DOI: 10.18332/pht/149684

The effects of weight loss on the metabolic complications of obesity

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Weight loss has profound effects on body composition and metabolism in people with obesity. Fat mass, fat-free mass, and resting energy expenditure decrease linearly with weight loss. Visceral adipose tissue and liver fat content decrease with small reductions in weight (2–5%) and decrease further with more weight loss. Hepatic inflammation, ballooning, and fibrosis require greater weight loss to improve (≥ 7 –10%). Cardiometabolic risk factors (fasting glucose and insulin concentrations, glycosylated hemoglobin, lipid profile, and blood pressure) improve with small reductions in weight (2–5%) and gradually thereafter with more weight loss. Skeletal muscle insulin sensitivity increases dose-dependently from 5% to 16% weight loss, whereas adipose tissue and hepatic insulin sensitivity and hepatic triglyceride secretion improve maximally with modest reductions in weight (5–10%) and do not improve further with more weight loss. Pancreatic insulin secretion does not respond to weight loss typically achieved by calorie restriction (≤ 15 %) but may decrease after massive

weight loss (≥ 17 %). Weight loss dose-dependently reduces risk for diabetes, reduces the need for antidiabetic medications, and increases chances for diabetes remission. Apparently, weight loss even in amounts below what is considered clinically significant (5%) is beneficial for individuals with obesity, although more weight loss is almost always better.

Public Health Toxicol 2022;1(Supplement 1):A39

DOI: 10.18332/pht/149686

Public health actions that appear promising to halt obesity

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Obesity is a major threat to public health that disproportionately affects certain population groups and a key driver of non-communicable diseases. All regions of the world and age groups are affected by the problem. According to WHO, 1.9 billion adults were overweight in 2016, of which 650 million were obese. Its significant health and economic burdens are a big concern for many governments and intergovernmental agencies that propose numerous global and national action plans to halt obesity. Such population-wide actions consider measures that influence health behaviors and make healthy options the easy options. Examples include fiscal policies, nutritional labelling, changes in the food system, e.g. reduced portion sizes and product reformulation, restrictive food marketing and advertising to children, and actions to promote healthier environments in school¹. Despite policy responses put in place, obesity continues to be a pressing public health issue indicating that responses need to be stepped up using innovative and multi-sectoral approaches. Critical to the development and success of such actions, is the participation of the scientific community in the knowledge-transfer and decision-making processes by addressing both research- and policy-driven questions and by collaborating closely with policy makers and other stakeholders².

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Public Health Toxicol 2022;1(Supplement 1):A40

DOI: 10.18332/pht/149687

Mediterranean diet and weight loss maintenance

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Several whole diet approaches, i.e. dietary patterns, have been explored in the context of weight management. The Mediterranean diet is one of them. The concept of this diet was originally conceived by Ancel Keys, in the Seven Countries Study¹; nowadays, the term Mediterranean diet is widely used to describe a dietary pattern characterized by the abundance of plant foods (fruits, vegetables, cereals, legumes) and the use of olive oil as the principal source of fat². It also includes moderate amounts of dairy products (principally cheese and yogurt), low to moderate amounts of fish and poultry, red meat in low amounts, and wine consumed modestly. Higher adherence to this pattern has been found to prevent long-

term weight gain³⁻⁵ and to produce significant weight loss, with or without energy restriction⁶. In relation to weight loss maintenance, results from our group in a large cohort of weight loss maintainers and regainers (the MedWeight study) indicate that high adherence to the Mediterranean diet is associated with a 2-fold increased likelihood of weight loss maintenance⁷.

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Public Health Toxicol 2022;1(Supplement 1):A41

DOI: 10.18332/pht/149692

Breastfeeding and allergy development in children

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Breastfeeding is proven to be the most advantageous source of nutrition for infants, the young developing organisms. The benefits of human milk refer to its nutrients contents, its composition and its impact on the psychological development of the infants. The transformation of various immunological factors from the mother to the infants is related with protection from infections and diseases with immunological dysfunction (diabetes mellitus type I, coeliac disease, graft rejection). Allergy, the pandemic of the modern world is linked to time of exposure to allergens in relation to immune system development.

Food antigens in human milk are negligible in comparison to infant powder milk. In addition, neonates are unable to process antigens. In addition, the antigens offered to the breastfeeding neonates are already processed in the maternal gut. The question that is addressed is if human milk is in favor of tolerance development, instead of allergy. International literature provides us with contradictory results.

In a review article by J.van Odijk et al. it was concluded that exclusive breastfeeding reduces the risk for asthma and respiratory wheeze of atopic dermatitis. Friedman et al. in a review article, presented studies with contradictory results,

nevertheless with a lot of biased data. A significant prospective study from Sweden revealed that breastfeeding for at least 4 months is related with decreased risk for wheeze, asthma, atopic dermatitis and multiple allergic manifestations.

The factors related with the development of tolerance and breastfeeding are:

1. The presence of antigens in a processed form and in negligible quantity.
 2. The presence of tolerance including molecules and in balance with inflammatory factors.
 3. The gut flora and the permeability of the gut epithelium.
- Human milk, is a complex somatic fluid that is offering to the infant nutritional factors, passive immunity and elements contributing to the development of its own immune system. Exclusive breastfeeding for at least 4 months seems to be protective for the development of atopic dermatitis and wheeze. The transformation of antigens via the breast milk to the infant contributes to its own immune system development and tolerance induction. Breastfeeding should be encouraged for infants and especially for those with increased risk for atopic manifestations.

Public Health Toxicol 2022;1(Supplement 1):A42

DOI: 10.18332/pht/149693

Complementary feeding in Greece: The 2019 update of recommendations

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Complementary feeding is the transition from milk feeding to family foods. These foods are necessary to cover the age-appropriate nutritional needs since this transition happens during a period of rapid growth and development, when infants are susceptible to nutrient deficiencies and excesses. Gastrointestinal and renal functions as well as the relevant developmental skills have to be sufficiently mature during this important stage. Complementary foods (i.e. solid foods and liquids other than breast milk or infant formula) should be introduced during the second half of the first year of life and never before the age of 4 months. Healthy term infants should be offered foods with a variety of flavors and textures, including bitter tasting green vegetables. Continued breastfeeding is recommended alongside CF. Allergenic foods may be introduced while breastfeeding. Whole cow's milk should not be used as the main drink before 12 months of age. Added sugar and salt should be avoided. All infants should receive iron-rich complementary foods including meat products and/or iron-fortified foods. It is suggested that feeding with commercially available infant food starts after the 6th month and generally restricted in cases that healthy home prepared food is not available.

Public Health Toxicol 2022;1(Supplement 1):A43

DOI: 10.18332/pht/149694

Can we halt obesity with breastfeeding?

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Childhood and adult obesity is a serious public health concern and rising rates are not always interpreted by overeating. Current evidence on human adult and infant studies clarifies the associations with gut microbiota and infant overweight or adult weight status and implicates how the composition of the gastrointestinal microbiome influences energy absorption,

immune homeostasis, host metabolism, and weight control. The optimal policy generally to promote the colonization of a healthy infant gut microbiome, is to have a vaginal delivery followed by exclusive breastfeeding until 6 months of age with minimal exposure to antibiotics. Moreover, there is a dose-response effect between duration of breastfeeding and reduced risk of early childhood obesity.

Possible mechanisms linking breastfeeding to early childhood obesity are recognized. Quantity of protein in human milk is lower than that in formula. The longer a child is breastfed, the lower the risk of childhood obesity. Additionally, maternal dietary flavor delivered in breast milk may influence infant's later taste and food acceptability. Secondly, infants who are breastfed for a long time are more self-adjusting and may decrease their milk consumption when complimentary food is introduced. Utilization of human milk in diet provides hope for halting obesity.

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Public Health Toxicol 2022;1(Supplement 1):A44
DOI: 10.18332/pht/149698

Prevalence of childhood obesity in Greece: Results from WHO Childhood Obesity Surveillance Initiative 2010–2020

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Introduction

Childhood obesity is a major public health issue. The prevalence of childhood overweight and obesity has increased substantially in the last decades worldwide, affecting one in two children in some countries of Southern Europe. In 2010, the prevalence of obesity in children 7 or 9 years old in Greece was the highest in Europe.

Aim

Our aim was to investigate the changes in overweight and obesity among Greek primary school children who participated in Rounds 2 (2009–2010), 3 (2012–2013), 4 (2015–2016) and 5 (2019–2020) of the WHO Childhood Obesity Surveillance Initiative (COSI).

Methods

All COSI Rounds were performed in a nationally representative sample of Greek schools, in children aged 7.0–7.9 and 9.0–9.9 years. Questionnaires regarding student data, school environment and family environment were completed. Anthropometric measurements (body weight, height, waist and hip circumference) were taken by experienced dietitians. All answers and measurements were stored in a custom-built, secure web-based patient information system.

Results

Overweight and obesity prevalence for both boys and girls in both age groups decreased both from 2010–2013 and from 2013–2016. From 2016 to 2019 no major differences were observed. Statistically significant decreases were observed for all groups from 2010–2016. The decrease was higher for girls compared to boys and for children aged 9 years compared to children aged 7 years.

Conclusion

The latest COSI results show that, while still very high, the prevalence of childhood obesity in Greece decreased since 2010, mainly due to several preventive interventions targeting primary school children. However, multiple strategies that will involve family, community and school staff and make use of novel approaches such as Big Data Analytics and smart devices must be adopted, in collaboration with Greek Ministries, in order to ensure the downward trend in the obesity epidemic.

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Public Health Toxicol 2022;1(Supplement 1):A45
DOI: 10.18332/pht/149699

COSI Rounds 4 and 5: Results of these last two rounds

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Childhood obesity is one of the major public health problems in Cyprus. It seems that the high prevalence of diabetes and cardiovascular diseases is highly connected with unhealthy eating, sedentary life, and childhood obesity. When WHO announced the COSI program, the Ministry of Health of Cyprus was one of the first which expressed interest in participating. Cyprus is taking part in the COSI program since the first round but due to technical problems we were able to deliver our first results only in the last two rounds, i.e. Round 4 (2015–2017) and Round 5 (2019–2020). Overweight and obesity prevalence in the WHO European Region COSI (2015–2017), places Cyprus in the highest position with 43% in both girls and boys. Limited duration period of physical education classes alongside with the unhealthy food environment might be adverse factors for addressing the burden.

The 5th round of COSI Cyprus gave us even more disappointing results. Due to the low participation of 1st grade students, the only targeted group that is considered for comparison with the other COSI countries is the 9-year-olds. A total number of 1392 children were included with prevalence of overweight 43.3% and obesity 19.25%.

These results show a severe increase of childhood obesity since 2015–2017. The school environment and exercise behavior in schools does not show any positive change and might be considered as one of the main reasons for these results. We are currently enrolled in Round 6 with the same schools used during the last two rounds, taking anthropometric measurements as well as family history (nutrition, exercise and healthy lifestyle). We are looking forward to these results but we are not optimistic since the COVID-19 pandemic has a negative effect on peoples' healthy lifestyles.

Public Health Toxicol 2022;1(Supplement 1):A46

DOI: 10.18332/pht/149700

WHO Europe Childhood Obesity Surveillance Initiative: A 15 years study in 45 European countries

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Since COSI started in 2007/2008, over half a million children (aged 6–10 years) are measured and weighed according to the COSI protocol¹ in 45 countries, every 3 years. Particular attention was given to the last two years marked by the global COVID-19 pandemic. Prevalence values of overweight and obesity are calculated by age group, using the cut-offs recommended by WHO² to compute BMI-for-age Z-scores. In the 1st (2008) and 2nd (2010) rounds, prevalence of childhood overweight (including obesity) varied from 19.3% and 18.4% in Belgium to 49.8% and 42.5% in Italy, respectively. In both rounds, multi-country comparisons suggested the presence of a north–south gradient with the highest level of overweight found in southern European countries³. The latest data from the 4th round (2016) showed a significant decrease in the prevalence of both overweight and obesity which was recorded in Greece, Italy, Portugal, Spain and Slovenia, ranging 4–12% and 3–7%, for boys and girls, respectively. Belgium, Czech Republic, and Norway, have stable prevalence; whereas the picture is less definite in Bulgaria, Latvia, and Lithuania⁴. The 5th (2019) and 6th (2022) rounds were marked by a 2-year COVID-19 pandemic. Due to the need to understand the impact of COVID-19 on the children's and families' lifestyles, 30 COSI countries are now collecting data on how the governmental measures put in place to mitigate the

spread of COVID-19, impacted families' and children's daily lifestyles and nutritional status. COSI progress throughout the last decades enabled to identify the key issues that need to be addressed and mobilized governmental action to counteract the development of childhood obesity, potentially exacerbated by the health, social economic and constraints lived in the recent years.

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Public Health Toxicol 2022;1(Supplement 1):A47

DOI: 10.18332/pht/149702

Exercise and diabetes

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The prevalence of diabetes is steadily increasing and it is expected that about 783 million people globally will suffer from the disease by the year of 2025¹. There is strong evidence suggesting that regular exercise reduces the risk for developing type 2 diabetes in individuals at high risk and for developing microvascular and macrovascular disease complications. Furthermore, in gestational diabetes, exercise reduces the incidence of macrosomia and fetal preeclampsia. Also, regular physical activity provides a better glycemic control, enhances insulin sensitivity and improves emotional and physical well-being²⁻⁴. Therefore, exercise is considered today as a mandatory supplement to medical treatment activity by all major scientific bodies [American College of Sports Medicine; American Diabetic Association (ADA); European Association for the study of diabetes (EASD); IDF; International Society for Pediatric and Adolescent Diabetes (ISPAD)]. In terms of exercise guidelines for diabetes, specific recommendations regarding frequency, duration, intensity and modality have been formulated. According to these recommendations exercise/physical activity should be performed at least 3 days/week without more than two consecutive days inactivity, whereas for children and adolescents 1-hour daily exercise is recommended. Aerobic exercise should be performed for >150 min/week at about 60–80% maximum heart rate. Resistance exercise at an intensity equivalent to 50–80% of maximum should also be carried out 2–3 times/week, but not on consecutive days, while flexibility and balance activities should be practiced almost daily^{3,4}. Despite the beneficial role of exercise, diabetics have low rate of physical activity, putting

forward as an excuse the fear of hypoglycemia, although factors such as lower self-efficacy, inappropriate goal setting and lack of supervision, social support and access to facilities may also be involved⁴. However, due to technological achievements, the development of continuous glucose monitoring systems together with insulin pumps as well as the detailed guidelines/protocols for dietary and medication modifications for people involved in physical activities provide a very safe environment for patients who wish to incorporate exercise in their daily routine³⁻⁵. It is the responsibility of physicians to convince their patients to regularly adopt exercise.

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Public Health Toxicol 2022;1(Supplement 1):A48

DOI: 10.18332/pht/149703

Exercise and cancer

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Adequate scientific data link regular physical activity with a reduction in the risk of cancer as well as of cancer mortality rates. Regular physical exercise can help prevent many types of cancer and reduce the progression of the disease, improving the clinical outcomes after diagnosis. Conversely, the disease itself and the anti-cancer therapies can affect health-related fitness parameters and the patients may experience side effects that limit their overall functional capacity and exercise ability. While it is important not to overlook the most common toxicities associated with anticancer therapies, there is strong scientific evidence that exercise is safe for all types of cancer and these patients should avoid physical inactivity both during and after their treatment. Before designing an appropriate exercise program for cancer patients, it should be made clear, through appropriate general and site-specific assessment, how much their functional capacity has been affected by the disease, during treatment and after its completion. Moreover, before assessing the patient's physical fitness, or before designing an exercise program, the patient's medical history, chronic comorbidities, and other health problems, as well as any contraindications to exercise should be considered.

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Public Health Toxicol 2022;1(Supplement 1):A49

DOI: 10.18332/pht/149704

Nutritional assessment of athletes with disturbed eating behavior

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Disordered eating behaviors and eating disorders (EDs) are serious disturbances that negatively affect physical as well as psychological health. Existing literature provides convincing evidence that athletes demonstrate a greater prevalence of eating disorders than the general population, both at clinical and subclinical levels.

Athletes' nutritional assessment is a complicated and systematic process of collecting information in order to make conclusions regarding the nature and cause of health problems linked to their nutritional status and affecting their dietary choices. The nutritional needs of athletes with disordered eating patterns behaviors are not static and differ depending on the requirements of each training goal and the athletes' overall needs. The assessment process may include the collection of financial, social, medical, and psychological information which affects food choice and dietary practices. The use of appropriate tools is required both to identify athletes in need of support and to monitor dietary intervention, and their impact on athletic performance when required. The purpose of this presentation is to provide valid and reliable tools and methods that can be used by experts to identify athletes with disturbed eating behavior.

Public Health Toxicol 2022;1(Supplement 1):A50

DOI: 10.18332/pht/149746

Legal ergogenic dietary supplements: Health side-effects

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The use of legal ergogenic aids is widespread in athletic populations and varies between 40% and 100% of athletes of both sexes, depending on the sport discipline and the level of competition. Often, athletes take simultaneously various products without regard to optimal dose schemes and total dosage of some ingredients or synergic and antagonistic interactions between them. Thus, some commonly used nutritional aids may lead to health disorders. The legal nutritional supplements which are permitted by WADA and that are supported by reliable evidence of promoting athletes' physical performance include caffeine, creatine, carbohydrate drinks/gels/bars, β -alanine, bicarbonate, nitrate (beetroot juice) and proteins. Caffeine use shows the most side effects

and these become more common with caffeine doses over 9 mg/kg of body mass. Overdose may lead to cardiotoxicity with significant cardiovascular side effects such as tachycardia, coronary and peripheral vasoconstriction, and elevated blood pressure especially in caffeine-naïve recreational athletes. More research studies on biomedical side effects and educational campaigns, particularly aiming at children and athletes of developmental ages, can have a significant influence on nutritional supplements use in sports and may act as the most powerful tools for an effective fight against the indiscriminate use of legal ergogenic aids.

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Public Health Toxicol 2022;1(Supplement 1):A51

DOI: 10.18332/pht/149747

Methodological issues in personalized sports nutrition: The case of antioxidant supplements

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Emerging evidence suggests that the presence of oxidative stress per se does not rationalize the use of antioxidants, emphasizing the need to identify 'responsive' phenotypes for personalized interventions¹. This originates, most probably, from the fact that we all inherit and acquire different and/or unique biological and behavioral characteristics. These characteristics regulate the impact of any (e.g. nutritional) treatment that affects physiology resulting in beneficial, harmful or neutral outcomes (e.g. exercise performance)^{2,3}. As a result, the issue of individual responsiveness attracted the interest of researchers across diverse scientific fields, while personalized nutrition became a central translational goal. Unfortunately, most studies on the topic followed suboptimal methodological approaches to quantify individual responses and to specify statistical thresholds of effectiveness ('minimal clinically important difference' or 'smallest worthwhile change')^{4,5}. Thus, the typical classification of participants after any treatment into 'high', 'low' or 'adverse' responders commonly lied in the eye of the beholder. Herein, diverse methodological and statistical practices that seem to provide a more straightforward approach for personalized sports nutrition studies will be presented, which may be of interest for research and applied purposes.

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Public Health Toxicol 2022;1(Supplement 1):A52

DOI: 10.18332/pht/149749

Muscle tissue as an endocrine gland: Its role in health

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Until now, the role/impact of skeletal muscle, which is the largest tissue of the human body and possesses an important role in glucose-lipids metabolism and clearance, on glycemic-lipidemic blood profiles, cardiometabolic risk factors and diseases, remains largely unknown. Muscle tissue but mostly its components, e.g. muscle fibers, lately have been suggested as significant regulators of human metabolism, health and body composition, in a muscle fiber type and size-dependent manner. Participants possessing higher number and sizes of Type I (slow oxidative), IIa (fast oxidative-glycolytic) and low Type IIx muscle fibers (very fast glycolytic), are characterized by healthier body composition, glycemic-lipidemic blood profiles and lower cardiometabolic risk factors, even if they follow poor lifestyle choices (like inactivity, unhealthy nutrition etc.). Complex muscle-organs crosstalk mechanisms have been presented until now, including the fiber type-specific metabolic procedures, expression of myokines, exerkines, myobolites etc., that are underlying the regulatory effect of muscle tissue and muscle fibers on human metabolism, health, body composition and cardiometabolic risk factors. However, nutrition, systematic training, and their combinations could change muscle metabolic functions, by regulating muscle fiber composition and metabolism, and thus the muscle-organs crosstalk mechanisms, either positively or negatively. All the above will be highlighted during this presentation, practical applications will be also presented, while emphasis will be given to what we do not know up to now.

Public Health Toxicol 2022;1(Supplement 1):A53

DOI: 10.18332/pht/149757

Personalized nutrition for the prevention of cardiovascular diseases

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Emerging technologies in nutrigenomics and deep phenotyping have allowed us to collect a vast range of data on genetic indicators, clinical biomarkers, sensitive body composition metrics, and dietary intake data. It is clear that the interplay between genetics, dietary habits and lifestyle determines a person's risk to develop cardiovascular disease. While this relationship is less plastic in the case of monogenic or familial hypercholesterolemia (FH), the most common hypercholesterolemia cases are of polygenic nature and the interactions between genetic variation and environmentally induced responses are more plastic. Despite the nature of the

pathology, the key challenge in hypercholesterolemia remains in the mismatch between genes involved in lipid metabolism and modern diet and a variety of lifestyle factors. The field of precision nutrition is focused on unravelling the factors that explain the interindividual variability in response to lifestyle and nutritional interventions. Latest advances in this area have explored how new applications of metabolomics, nutrigenomics and microbiota profiling could provide new avenues to successfully implement innovative precision nutrition approaches to identify health risks and implement preventative strategies to avoid disease. The current challenge remains to meaningfully translate these findings into clinically relevant pieces of information.

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Public Health Toxicol 2022;1(Supplement 1):A54
DOI: 10.18332/pht/149763

How effective are counselling interventions in the treatment of cardiovascular diseases?

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Research regarding treatment of cardiovascular diseases has revealed many approaches including drug therapy, as well as lifestyle changes. The latter being extremely challenging, has led to the investigation of novel methods in order to maximize effectiveness of intervention programs. One such method is counselling through many different approaches such as face-to-face, web-based or mobile counselling. The problem regarding lifestyle changes has always been the challenging goal to get patients to adhere to a new dietary pattern and healthier lifestyle habits, and to maintain these changes for lifetime. Yet, not many approaches regarding lifestyle changes have been successful. Counselling has been introduced to this effort much later than others, and since it is an ongoing investigation, it is to be assessed whether it is a promising method for cardiovascular disease treatment.

Public Health Toxicol 2022;1(Supplement 1):A55
DOI: 10.18332/pht/149765

Sustainability of dietary standards recommended for the prevention and treatment of cardiovascular disease

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Recently, the American College of Cardiology/American Heart Association (ACC/AHA) have stressed the importance of lifestyle modification through diet and health to manage CVD morbidity and mortality. These dietary guidelines include high quantities of non-starchy vegetables, fruits, whole grains and legumes plus moderate consumption of nuts, seafood, lean vegetable protein or animal, low-fat dairy and vegetable oil, based on evidence. A focus on increasing plant-based protein sources in the diet, provides health benefits and is also recommended as more environmentally sustainable, since gas emission derived from animal production would be reduced. Sustainable diets, however, are multifaceted.

Strong evidence indicates that food production is among the largest drivers of global environmental change by contributing to climate change, biodiversity loss, freshwater use, interference with the global nitrogen and phosphorus cycles, and land-system change. Climate change impact is especially large in specialty cropping systems that contribute to the global diet, including specific healthy fruit and vegetable crops, such as avocados, as well as perennial cropping systems. Olive oil production requires more water compared to other vegetable oils as does watermelon compared to dried figs.

A sustainable healthy diet therefore is the new focus and needs to shed light to healthy dietary-patterns that simultaneously promote reductions in food waste and major improvements in food production practices.

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Public Health Toxicol 2022;1(Supplement 1):A56
DOI: 10.18332/pht/149768

Stress and chronic diseases

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Exercise, a diet of high nutritional value, a regular daily routine, and good sleep are among the sine qua non. It is far easier to enjoy a good psychological state if one has slept well. Beyond this, studies have shown that stress can be managed more effectively by those who have a more philosophical outlook on life. Those who can control their basic instincts and regulate their emotions, leave longer. In the past few years, we have studied more than 450 centenarians in the Attica region.

On average, they were never overweight, did not suffer bouts of clinical depression, ate a healthy diet, and led lives of impressive regularity. Human beings are the only creatures to have developed a formidably complex prefrontal cortex, which can exert control over instincts, impulses and emotions, stimulate hope and assist in the attainment of a sense of well-being, and a lasting state of happiness.

As human beings, we can harness the systems of our brain that control stress and emotions by means of philosophy, psychotherapy, meditation, or prayer. All religions inherently contain the necessary philosophy for a better and happier life.

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Public Health Toxicol 2022;1(Supplement 1):A57
DOI: 10.18332/pht/149771

How does lifestyle impact incidence of cancer: Preventive measures to consider

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In modern times, cancer is a 'pandemic' with 10 million deaths a year, being the second leading cause of death worldwide after cardiovascular disease. According to the World Health Organization and the American Institute of Cancer Research, 30% to 50% of the most common cancers could be prevented by simple lifestyle changes.

These changes are summarized in the following list:

1. Maintenance of a healthy weight at any age
2. Exercise
3. Adoption of a healthy diet (ideally the Mediterranean)
4. Reduction of alcohol consumption to 1 drink per day, for women or 2 men
5. Avoidance of dietary supplements
6. No smoking in any of its versions, as well as places where others smoke (passive smoking)
7. Breastfeeding of infants, if possible
8. Protection from excessive sun exposure
9. Vaccination against hepatitis B and HPV.

Adherence to the above measures has the same positive effect on people who have survived cancer and contributes

significantly to the prevention of cardiovascular disease, type 2 diabetes, and chronic respiratory diseases, i.e. the prevention of non-communicable diseases which together with cancer are the cause of over 70% of deaths worldwide.

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Public Health Toxicol 2022;1(Supplement 1):A58
DOI: 10.18332/pht/149774

How stress affects eating behavior

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The body's response to stress is an adaptive phenomenon in order to manage real or perceived risk. However, if the stressor is chronic or very severe it can trigger or accelerate a wide variety of illnesses and disorders, including mood disorders such as post-traumatic stress, anxiety and depression.

The brain has the ability to remember what substance is causing the state of rest it desires. In situations of fatigue and insomnia, the brain looks for foods that will make it feel better. So, with these foods it tries to fill the internal gap and support the reward system.

Studies on stress have shown that people who have higher levels of cortisol are more likely to eat more and more high-calorie foods. These foods can activate the reward system by causing dependence on food corresponding to that of drugs and substances. Foods that contain sugar, salt, white flour and foods that are low in vitamins and minerals stimulate the stress system and weaken the body's resistance. Foods rich in carbohydrates and fat stimulate the neurotransmitter system (endorphins and dopamine) that affects pain control, reward, enjoyment, satisfaction, and addiction.

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Public Health Toxicol 2022;1(Supplement 1):A59
DOI: 10.18332/pht/149777

Diet, nutrition and cancer: The way forward during cancer therapy

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Nutrition support during cancer therapy is considered to be a new field of research. The way forward during cancer therapy includes many studies in several fields. The gut microbiota seems to interfere with several cytotoxic agents influencing their action, effectiveness, and toxicity. Curcumin inhibits COX-2 and NF-κB in cancer cells competing the action of irinotecan and cyclophosphamide. Other nutrients of research are green tea, omega 3 fatty acids, melatonin and several herbs. Fasting is characterized by the complete deprivation of food but not water, with intervention periods of normal food intake, whereas intermittent fasting, periodic fasting, short-term fasting, fasting mimicking diet, or a combination of fasting diets, have been used in several clinical trials. The results revealed improvement of the chemotherapeutic response and, in combination with cytotoxic agents, elicited differential responses in normal and cancer cell, a phenomenon known as differential stress resistance (DSR). Ketogenic diets have been

used in clinical trials alone or in combination with fasting diets. Though they seem to be well tolerated, no significant results were documented. The path forward for harnessing new dietary approaches in oncology seems to be oriented towards a personalized dietary approach guided by certified dietitians.

Public Health Toxicol 2022;1(Supplement 1):A61
DOI: 10.18332/pht/149779

Diet, nutrition and cancer: The way forward after cancer therapy

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Cancer survivors are considered a unique population that is growing rapidly. It is well-documented that modifiable risk factors such as nutrition, physical activity, and obesity may affect the risk for recurrence and overall survival during survivorship. Moreover, the way of living after cancer diagnosis and treatment can lead to a poorer quality of life and increased risk of developing co-morbidities, such as type 2 diabetes, hypertension, and cardiovascular disease. On the other hand, there is evidence that lifestyle modification including the improvement of diet and physical activity would potentially benefit cancer survival rates and overall mortality. Therefore, national organizations have published specific guidelines for cancer survivors that should be considered in a comprehensive survivorship care plan. These guidelines include recommendations on diet, exercise, alcohol, and anthropometric parameters, with the necessary support on behavior change enabling survivors' ability to adhere to these recommendations. Briefly, cancer survivors are being recommended to achieve and maintain a healthy body weight through a balanced nutrition, a limited alcohol consumption and an increased physical activity. Healthcare professionals should include the current guidelines along with attention to every survivor's personal needs for a tailored-made optimal survivorship care plan.

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doi:10.3322/caac.21719

Public Health Toxicol 2022;1(Supplement 1):A61
DOI: 10.18332/pht/149780

Diet, nutrition and cancer risk: Current knowledge and future perspectives

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Cancer incidence is on the rise worldwide and is projected to continue in the next decades¹. It has been established that lifestyle, and nutrition especially, has a crucial role in cancer development, especially in the most common cancers, such as breast, prostate, and colorectal². Organizations such as the World Cancer Research Fund and the American Cancer Society have recently released dietary guidelines for the reduction of the risk of developing cancer². Guidelines focus on the role of excess weight and body fat, as well as specific nutrients and dietary patterns in cancer development. Examples of convincing evidence on the role of nutrition in cancer development include red and processed meat with colorectal cancer, and obesity with eleven different cancers². In this presentation, all the latest evidence regarding the role of excess weight and obesity, nutrients and dietary patterns will be presented, as well as future research that is warranted to better understand the role of nutrition in cancer development.

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Public Health Toxicol 2022;1(Supplement 1):A62
DOI: 10.18332/pht/149781

Debate: Pros and cons of being a vegetarian – Cons

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Vegetarian dietary patterns are rather diverse due to the wide range of available food choices and the different motivational factors of adopting such patterns. The potential health outcomes of vegetarian diets have been extensively investigated, with the majority of studies indicating favorable effects against cardiometabolic risk factors and lower risk of major chronic diseases. Nevertheless, there are health concerns regarding the adequacy of several nutrients, i.e. vitamin B12, vitamin D, ω-3 fatty acids, calcium, iron, and zinc. Vegetarian diets are negatively associated with bone mass density and skeletal muscle mass especially in older people, while vegetarians are at high risk for iron deficiency. The Dietary Reference Intakes report, suggests that vegetarians should consume 1.8 times more iron than the RDA, while vegetarian iron sources are less bioavailable. Dietary protein may represent similar considerations, while protein quality

and digestibility are recognized as potential concerns also influencing gut microbiota. Specific population groups, i.e. pregnant women, children, elderly and athletes, may run the risk of malnutrition. A negative impact on cognitive and mental health has been reported too. When a vegetarian diet is appropriately planned and includes fortified foods and/or supplements, it can be nutritionally adequate for adults and children and can promote health.

Public Health Toxicol 2022;1(Supplement 1):A63

DOI: 10.18332/pht/149787

Debate: Pros and cons of being a vegetarian – Pros

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Vegetarian diets were shown to exert several cardiometabolic benefits, mainly attributed to their high content in antioxidants, vitamins, minerals, whole grains, fruits, vegetables, legumes, nuts and fibers, as well as to the absence of unhealthy fat consumption. In this context, these diets were reported to reduce the risk of developing cardiovascular diseases, metabolic syndrome, obesity, type 2 diabetes and some cancers. Indeed, the implementation of a vegetarian diet can improve blood lipids, glucose, blood pressure, and body weight. Vegetarianism also has a positive effect on the environment (by lowering the demand of mass-produced meats) and often represents an ethical choice against animal negative treatment and killing.

Different types of vegetarian diets include lacto-ovo-vegetarian (no meat or seafood, but eggs, dairy, and plant foods), lacto-vegetarian (no meat, seafood or eggs, but dairy and plant foods), ovo-vegetarian (no meat or seafood or dairy foods, but eggs and plant foods) and vegan (no animal foods, only plant foods). Therefore, there are multiple diet options for a vegetarian.

Vegetarians should also consume the appropriate number of calories and a variety of vegetables, fruits and whole grains, limit alcohol intake, avoid processed foods, unhealthful fats, added sugar and salt, do exercise, and avoid smoking.

Public Health Toxicol 2022;1(Supplement 1):A64

DOI: 10.18332/pht/149788

Fasting reprograms the miRNA profile of human plasma

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It is well-established that long-term fasting improves metabolic health, enhances the total antioxidant capacity and increases well-being. MicroRNAs oversee energy homeostasis and metabolic processes and are widely used as circulating biomarkers to identify the metabolic state. This study investigated whether the expression levels of twenty-four metabolism-associated microRNAs are significantly altered following

long-term fasting and if these changes correlate with biochemical and redox parameters in the plasma. Thirty-two participants with an average BMI of 28 kg/m² underwent a 10-day fasting period with a daily intake of 250 kcal under medical supervision. RT-qPCR on plasma small-RNA extracts revealed that the levels of seven microRNAs (miR-19b-3p, miR-22-3p, miR-122-5p, miR-126-3p, miR-142-3p, miR-143-3p, and miR-145-5p) were significantly altered following fasting. Importantly, the expression levels of these microRNAs have been consistently shown to change in the opposite direction in pathological states including obesity, diabetes, non-alcoholic

steatohepatitis, and cardiovascular disease. Linear regression analyses revealed that among the microRNAs analyzed, anti-inflammatory miR-146-5p expression displayed most correlations with the levels of different biochemical and redox parameters. In silico analysis of fasting-associated microRNAs demonstrated that they target pathways that are highly enriched for intracellular signaling such as mTOR, FoxO and autophagy, as well as extracellular matrix (ECM) interactions and cell-senescence. Overall, these data are consistent with a model in which long-term fasting engages homeostatic mechanisms associated with specific microRNAs to improve metabolic signaling regardless of health status.

Public Health Toxicol 2022;1(Supplement 1):A65

DOI: 10.18332/pht/149789

Metabolomics biomarkers in association with nutritional interventions in cardiovascular disease

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By quantifying a wide range of small polar metabolites through advanced analytical techniques, metabolomics can shed light on several metabolic alterations in response to both normal and pathological conditions. Hence, metabolomics-based studies seem to hold the promise of precision and personalized medicine. The identification of specific cardiovascular disease targets could also help in evaluating the efficacy of nutritional interventions; adopting health-promoting dietary habits and lifestyle changes might lower the risk of traditional and emerging cardiovascular risk factors¹. Within the context of the CorLipid study, various food intake patterns have been associated with different severity, progression and prognosis of coronary artery disease as revealed through SYNTAX score evaluation, assessment of several cardiometabolic markers, and 3-year patient follow-up². Specifically, vegetarian-based diet has been linked with higher survival rates among patients suffering from unstable angina pectoris. Some of the studied acylcarnitines and ceramides species have been also significantly, yet weakly, correlated with specific nutritional patterns. Moreover, several metabolomics biomarkers seem to exert substantial prognostic impact in patients with comorbid diabetes mellitus. In conclusion, modern and sensitive analytical platforms could support future endeavors to offer tailored and precise nutritional interventions from both a translational and clinical end, thereby paving the way to precision metabolomics-based clinical nutrition³.

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Public Health Toxicol 2022;1(Supplement 1):A66
DOI: 10.18332/pht/149798

Multi-omics footprinting in health and disease: Complexity and interpretation

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The revolutionary multi-omics technology attempts to bridge the gap between genotype and phenotype, providing new insights into an integrated understanding of health and disease by creating avenues for precision medicine, nutrition, and exercise. Prevention and management of metabolic disorders require a thorough evaluation of cellular stresses (metabolic, inflammatory, and oxidative) assessing complex molecular profiles such as metabolomics, proteomics, lipidomics, genomics, nutrigenomics, epigenomics, and transcriptomics. Changes in omics illustrate the interplay between biological processes and pathways based on regulated targets known as footprints. Although there is no reliable method for integrating omics data with clinical data, the clinical relevance of these complex molecular profiles and the development of useful diagnostic and prognostic biomarkers must be the driving force in detecting subclinical conditions for better interventions in management and control of diseases. The ultimate goal is to provide a user-friendly analytical tool for targeted interventions. However, the interpretation of multi-omics data at an individual level still remains a difficult task for decision-making in every day clinical practice. Interestingly, in an effort to deal with the unavoidable uncertainty of the extensive and complex information in omics data sets, a recent study explores the value of exercise inflammatory/oxidative signatures in insulin resistance.

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Public Health Toxicol 2022;1(Supplement 1):A67
DOI: 10.18332/pht/149801

Application of milk lipidomics in food analysis from a nutritional perspective

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Nutritional recommendations regarding the consumption of full-fat milk and milk products have long been a matter of debate in the scientific community, a fact that can be attributed

primarily to the high saturated fat content of milk and dairy products and evidence that support positive cardiometabolic effects following the consumption of these products^{1,2}.

However, recent analytical advances in the field of lipidomics have shed unprecedented light in the lipid composition of bovine milk, especially regarding the content in polar lipids (phospholipids, sphingolipids, glycolipids, and ceramides) that are amongst the main components of the Milk Fat Globule Membrane (MFGM)³.

Among others, these novel insights have intrigued nutritional scientists into showing the positive effects that Milk Polar Lipids (MPL) have on human health, and further increasing the need for large-scale intervention studies to provide more evidence to make solid nutritional recommendations⁴.

Here, a detailed picture of the status of the milk lipidome is provided, indicating components of high nutritional interest, and further discussing how the field of lipidomics can contribute to the search for more definite answers regarding the nutritional value of milk and dairy products.

Acknowledgements

This work was supported by the project "Foodomics-GR – National Research Infrastructure for the Comprehensive Characterization of Foods" (MIS 5029057), funded by the Operational Programme NSRF 2014-2020 and co-financed by Greece and European Regional Development Fund.

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Public Health Toxicol 2022;1(Supplement 1):A68
DOI: 10.18332/pht/149802

FOODOMICSGR_RI: Food and nutrition research studies through the application of omics technologies

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National infrastructure *FoodOmicsGR_RI*, a multidisciplinary consortium, is mainly focused on the comprehensive characterization of different food matrices, method development and implementation of dietary studies, supporting the AgroFood sectors. The RI combines strong expertise in basic science, advanced analytical techniques and bioinformatics with applied sciences, such as plant growth, oenology, animal husbandry, apiculture, food/nutrition science, and dairy products. One of the main objectives is the holistic analysis of food content, the promotion of Greek

products' value, and the study of possible effect of nutritional intervention on the metabolic/lipidomic-proteomic-genomic profile of biological samples of humans or/and animal cohorts. In the years of FoodOmicsGR operation, both targeted and untargeted omics protocols, using advanced analytical platforms, such as LC-MS/MS, GC-MS, LC/GC-QToF-MS, LC-TIMS-QToFMS, MALDI-ToFMS have been recruited for the discovery of potential (bio)markers in relation to food analysis, authenticity, geographical and botanical origin, health claims, quality and safety and many more other examples, in a plethora of matrices (honey, dairy products, meat, olive oil, etc.). Extensive databases were also constructed including targeted endogenous food metabolites.

Public Health Toxicol 2022;1(Supplement 1):A69
DOI: 10.18332/pht/149803

Public health and aging

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In light of the 'demographic storm' that already challenges most societal systems and is projected to intensify in future decades, it is imperative for the global community to promote adaptive strategies to sustain a longer human life expectancy. This presentation will focus on current and future public health efforts that should be undertaken toward sustainable increases of life expectancy, including preventing and/or delaying age-related diseases, promoting functional independence and social engagement in advanced age, and ensuring adequacy of healthcare services and nutritional supply.

Public Health Toxicol 2022;1(Supplement 1):A70
DOI: 10.18332/pht/149804

Mediterranean lifestyle medicine: The role of the nutritionist/dietitian

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Lifestyle factors and the way individuals conduct their lives have recently received great attention. This is because, unlike non-modifiable inherited characteristics, many lifestyle factors are partially modifiable and, therefore, may be subject to considerable intervention and improvement; sensible diets, adequate physical activity, avoiding tobacco use, moderate alcohol intake, and stress-reduction, have been associated with lower risk of obesity, insulin resistance, hypertension, dyslipidemia, and other chronic diseases, which are considered the major public health concerns of our time.

For effective prevention and treatment plans, clinicians should consider all lifestyle factors that affect human health, and not only the one that they are experts on. And even clinicians cannot be experts in all disciplines; the clinician of the future should be able to identify unhealthy behaviors in all lifestyle factors and either treat them or engage other specialties in the treatment plan.

Nutritionists/dietitians have the unique opportunity to make a real difference in the lives of their patients, as they are in the forefront of the prevention and treatment of many chronic diseases. For this to happen, it would require engagement in the Lifestyle Medicine discipline, the necessary training, and the ability and will to think 'outside the box'.

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Public Health Toxicol 2022;1(Supplement 1):A71
DOI: 10.18332/pht/149805

Nutrition as a tool for healthy aging

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Aging is a time-dependent loss of fitness expanding from molecular to cellular level leading to aging phenotype. Hallmarks of aging have been extensively described and are categorized to primary hallmarks causing damage to cellular functions that are followed by antagonistic responses to such damage that, in their turn, are getting disorganized. Integrative hallmarks are strongly related to the clinical phenotype and the clinical effects of aging as seen in exhaustion of functional reserves, organ decline and functionality impairment. Nutrition is a complex process that combines interactions that include among others different type of food, calorie intake, meal frequency and timing, single nutrient modifications, the microbiome and nutritional history, food preparation and cooking, personal preferences that in the end are all modulating the key mechanisms that maintain cellular, tissue and organ function during aging. A strong example of how this can happen is the Mediterranean diet, a dietary pattern that positively impacts each of the hallmarks of aging. Most importantly we need to recognize the fact that the aging trajectory followed in different periods across life is plastic, and may be modulated. For instance, change in nutrition by improvement of diet quality may contribute to better physical function in older age.

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Public Health Toxicol 2022;1(Supplement 1):A72
DOI: 10.18332/pht/149808

The role of gut microbes in health and disease

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In the human gut resides a complex microbial community whose size is equal to that of the human body eucaryotic cells, but with a functional capacity which outnumbers that of the host by a number of 100. Recent evidence suggests that this microbial community, often named as the gut microbiome, is important not only for the onset of infectious disease but also for the development also of non-communicable conditions,

like Crohn's disease and diabetes. Diet is a major regulator of the human gut microbiome composition and function. Early in life differences occur in the gut microbiome of breastfed compared with bottle-fed children, and it is notion that early gut colonization may influence long-term health. However, the role of diet in the causal pathway between the gut microbiome and disease can be very complex. Differences in the gut microbiome of obese people have been observed, but it is unclear if these are primary obesity initiators or simply the secondary effects of hyperphagia. Likewise in patients with coeliac disease, it is unclear if the gut microbiome plays a role in the disease underlying pathogenesis or any changes observed are the effect of treatment with gluten-free diet. An exciting area of future research is whether we can use microbial signatures as prognostic markers of adverse disease outcomes in condition, like intestinal failure, and also if dietary manipulation of the gut microbiome can control disease activity outcomes in patients with Crohn's disease and ulcerative colitis.

Public Health Toxicol 2022;1(Supplement 1):A73
DOI: 10.18332/pht/149809

The gut microbiota plays a central role in the attention deficit/hyperactivity disorder (ADHD)

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The gut-brain axis (GBA) is the bidirectional cross-talk between the gut microbiome and the central nervous system with the gut microbiota being the key regulator. The GBA axis includes nerve, neuroendocrine, and immune pathways, highlighting its central role in diverse neuropsychiatric disorders such as the attention deficit/hyperactivity disorder (ADHD). Today ADHD is the most prevalent neurodevelopmental disorder with unknown aetiology and extremely challenging diagnosis and treatment.

Compelling evidence supports a strong link between the gut microbiota and ADHD development. Gut microbiota has a great impact on the immune and neuroendocrine systems during the developmental critical periods in childhood when the ADHD onset occurs. Gut microbiota can directly or indirectly produce neuromodulators, like dopamine and serotonin, that can control dysfunctional behaviors and emotional regulation in ADHD. Additionally, patients with ADHD commonly manifest gastrointestinal symptoms, have an altered intestinal microbial genera, and specific dietary food known to modulate gut composition correlates with ADHD risk. Children with ADHD have significantly lower levels of omega-3 PUFAs and omega-3 PUFAs supplementation improves their inattention and hyperactivity symptoms by influencing their gut microbiota.

Modern life and its consequent changes in the dietary food, habits and lifestyles, have greatly impacted the gut flora increasing the neuropsychiatric disorder risk. Manipulations of the gut microbiome represent a promising therapeutic and preventive target in ADHD onset and development.

Public Health Toxicol 2022;1(Supplement 1):A74
DOI: 10.18332/pht/149810

Differences in bacterial community composition between healthy and polyps-related gut biopsies

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Although it is known that human gut (HG) microbiome diversity displays differences between healthy and non-healthy individuals, differences between healthy and pathogenic tissues on the same individual are not well studied. Here, we tried to examine these changes in correlation with different large intestine (LI) parts and the presence of different types of polyps and lesions. Flexible sigmoidoscopy or colonoscopy biopsies from macroscopically normal and abnormal tissues (polypoid), along with medical records, were collected from 16 individuals (mean age 67.8 ± 6.02 years, average BMI 24.7 ± 64.00 kg/m²) from Ippokrateio general Hospital of Thessaloniki (Gastroenterology Lab) and 'Konstantopouleio - Patission' General Hospital. Tissue DNA extraction and illumina sequencing using bacteria specific primers were performed, followed by taxonomic and statistical analysis. All samples were characterized by the dominance of Firmicutes, Proteobacteria, Bacteroidetes and Actinobacteria that are the main Phyla observed in HG. However, differences were observed between different LI parts as well as between healthy and polyps gut tissues. Cluster analysis based on Horn similarities exhibited low similarities between individuals (<60%) while small polyps (<0.8 cm) samples along with the respective healthy tissues from sigmoid and rectum were grouped with similarities >50%, similarly to respective samples from the cecum. The rest of the samples including large and low dysplasia polyps along with the respective healthy tissues were grouped in separate pairs or small groups and exhibited much lower similarities. Taxonomic analysis revealed several genera that were prevalent and were significantly different between groups. Lachnospiraceae species and Blautia were increased in cecum samples, while in sigmoid and rectum samples Bacteroides was more prevalent. For the large polyps and lesion samples, bacteria such as Streptococcus and Staphylococcus, common in human microbiome, were disproportionately increased in lesion biopsies probably due to their ability to enhance host cell proliferation. In some lesion cases, species such as Methylobacterium, Terrisporobacter or Finegoldia, were found to be significantly enhanced. Most importantly, these species were also enhanced in the respective healthy samples, implying their importance for potential biomarkers for precancerous stages.

Public Health Toxicol 2022;1(Supplement 1):A75
DOI: 10.18332/pht/149811

Feeding the food allergy child

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Food allergy represents a substantial health problem in childhood. Over 90% of food allergies are caused by: eggs, peanuts, cow's milk, soy, nuts, shellfish, fish, or wheat. Diet plays a crucial role in both the prevention and management of food allergy. The maternal diet, the microbiome and early life feeding have been investigated for the prevention of allergic diseases. Allergic reactions to foods impair an individual's health and quality of life. The report of poor growth in children with food allergy is relatively common and is generally attributed to the number of foods excluded and the duration of the diet. An impaired growth in atopic children should not be attributed only to a high number of allergens and foods to

be avoided, but to a general condition of 'sub-inflammation', which unfavorably affects the absorption and utilization of substrates. The dietary management of food allergy requires appropriate dietary choices to maintain adequate growth, starting with special formulas in infancy. Dietitians should provide a comprehensive, individualized treatment plan, considering the medical condition, food avoidance strategies, healthy eating, nutritional requirements, and family life. Individualized strategies should be implemented in terms of food allergy management and prevention from the start of complementary feeding.

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Public Health Toxicol 2022;1(Supplement 1):A76

DOI: 10.18332/pht/149554

The effect of industrial processing on the allergenicity of cow's milk allergens

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Background

The immunopathogenesis of cow's milk protein allergy (CMA) is based on different mechanisms related to immune recognition of protein epitopes, which can be affected by industrial processing.

Aim

The purpose of this Diagnosis and Rationale against Cow's Milk Allergy (DRACMA) guidelines update III article 1 is to give an overview of milk protein allergens on a molecular basis, to review their immunogenicity and allergenicity in the context of industrial processing, in order to improve the understanding of IgE-mediated, mixed and non-IgE mediated hypersensitivities to CMA.

Results

Raw cow's milk from farms has been associated with protection against allergies, asthma and atopic sensitization. This has recently been associated with the native whey proteins, like α -lactalbumin, β -lactoglobulin, bovine immunoglobulins or serum albumins, as well as with their lipophilic ligands. To facilitate safe and large-scale marketing, milk has to undergo industrial processing involving multiple technical steps, like acidic treatment, heating, filtration and defatting, sometimes irradiation, microwave treatment, drying, hydrolyzation and more. Milk processing results in structural changes of its proteins, like linearization, fragmentation, occurrence of homo- and oligomeric complexes and of larger aggregates. While some epitopes are lost, neoepitopes are newly generated and aggregated proteins also have a higher immunogenicity. Also, immunomodulatory lipophilic compounds in the milk matrix are separated during defatting.

Conclusion

While unprocessed, fresh cow's milk contains various tolerogenic factors, these are impaired by industrial processing. As a result, industrially processed milk harbours a higher allergenicity, supporting the spectrum of immunopathogenic mechanisms underlying CMA. Further studies are warranted to understand how to prevent turning milk protein compounds into allergens.

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Public Health Toxicol 2022;1(Supplement 1):A77

DOI: 10.18332/pht/149560

The role of lipocalins in allergic sensitization and their novel role in symptom relief: Two faces of one protein family

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Background

Lipocalins form a protein family with great functional similarities. Specifically, they absorb hydrophobic ligands, often complexed with iron, into their molecular pocket, and thereby act bacteriostatically. Accordingly, human lipocalin-2 (LCN2) is an acute phase protein involved in immune defence. Allergics harbor significantly lower LCN2 levels¹, in parallel they suffer from intracellular micronutritional deficiencies, especially of iron².

Aim

To study whether the loading of lipocalins may determine why some animal lipocalins act as allergens, and whether loaded ligands may turn lipocalins tolerogenic.

Results

The lipocalin beta-lactoglobulin (BLG), best known from cow's milk, acts as an allergen only in its empty form^{3,4}. However, BLG complexed with ligands occurring in cow stable dust contributes to the allergy protective effect of farms⁵. We developed a lozenge using BLG as a Trojan horse to carry micronutrients to the immune cells of allergics. In clinical double-blind placebo-controlled⁶ and provocation trials in pollen and house dust mite allergics, we demonstrated that with the BLG lozenge micronutritional deficiencies can be corrected. This is associated with a significant symptom relief.

Conclusion

We propose that spiking of lipocalins with nutrients, as shown for BLG, is a novel approach exploiting targeted micronutrition to halt the allergy epidemic.

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Public Health Toxicol 2022;1(Supplement 1):A78
DOI: 10.18332/pht/149563

Dietary management of type I diabetes

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Medical nutrition therapy (MNT) is the cornerstone of diabetes mellitus management. Especially in type 1 diabetes mellitus, individualized medical nutrition therapy is recommended to emphasize monitoring carbohydrate intake. Therefore, nutritional training in type I diabetes mellitus consists of primary and comprehensive dietary education.

In the primary nutritional education, the patients have been trained to acknowledge the impact of carbohydrates in postprandial glycemia and the effect of glycemic index and glycemic load of a meal in glycemic excursions. Also, they must be trained in carb counting using scales and the content of foods in carbs. Furthermore, the patients are taught to read nutritional labels to calculate the consuming carbs precisely and make healthy choices. This stage of nutritional education is completed when an experienced registered dietitian nutritionist confirms that the patient calculates correctly the carbs of each meal.

In comprehensive nutritional education, the main topics are: estimation of carb ratio and finding the ideal carb ratios, the timing of bolus, management of hypoglycemia and delayed prolonged postprandial hyperglycemia after consuming high protein and fat foods.

Moreover, the frequency and time of meals that patients must consume based on insulin regimen are essential components of dietary management of type I diabetes mellitus.

Finally, advanced technology in treating type I diabetes mellitus is a useful tool of adequate nutritional management.

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Public Health Toxicol 2022;1(Supplement 1):A79
DOI: 10.18332/pht/149587

Dietary management in kidney disease

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It has been almost 20 years since the first nutrition guidelines for patients with end-stage renal disease were published. The Kidney Disease Outcomes Quality Initiative (KDOQI) was a cornerstone that changed dramatically the nutritional management of CKD patients. In 2020, the KDOQI Clinical Practice Guideline for Nutrition in CKD: 2020 Update was published, joined with the Academy of Nutrition and Dietetics. The recent guidelines focus not only in patients on renal replacement but to the CKD stages 1–5 including those on transplantation.

Apart from the KDOQI 2020 nutritional guidelines, the medical teams dealing with CKD patients will also have relevant guidelines on hospitalized patients, published in 2021 by the European Society of Clinical Nutrition and Metabolism (ESPEN). These guidelines are a useful tool for clinicians and clinical dietitians for the management of the overall nutritional support during hospital stay of patients with Acute Kidney Injury (AKI) and patients with CKD in acute care.

Having these guidelines available, undoubtedly the nutritional assessment, management, and the provision of nutritional support of patients with CKD, is based on evidence-based data. Nonetheless, there are some aspects that need extra attention, in terms of dietary manipulation and availability of the methods and procedures proposed in clinical practice. The plant-based diets, the very low protein diets, the maintenance of dietary fiber intake alongside with the necessity of potassium control are issues that need to be stressed and emphasized. Moreover, evidence on the provision of nutritional support on patients with AKI and CKD during hospitalization is of great importance, especially for the clinicians and dietitians working in hospitals.

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Public Health Toxicol 2022;1(Supplement 1):A80
DOI: 10.18332/pht/149588

The role of nutritional education in the treatment of diabetes mellitus type 2

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Scientific organizations (e.g. ADA, EASD, IDF) have concluded that nutritional education is the cornerstone of preventing and treating diabetes. Large studies, such as Diabetes Prevention Program, showed that weight loss and increased physical activity reduced the incidence of DMT2 in overweight and obese adults and also reduced glucose tolerance by 58%, over 3 years. DPP showed that people with prediabetes should follow intensive behavior change programs and personalized diet intervention programs with specific goals of improving

eating habits, moderate-intensity physical activity (at least 150 minutes per week) and achieving and maintaining 7–10% loss of initial body weight.

Medical nutritional therapy (MNT) in diabetes has undergone major changes through the modification of guidelines by organizations, numerous new studies and scientific data, the development of new drugs and new types of insulin, in parallel with the evolution of technology (pumps, CGMs).

Today, in diabetes diet there is no 'one size fits all'. Dietitians should personalize the dietary treatment, individualize the proportion of macronutrients and take care of the chrononutrition (number and timing of the meals). Finally, a variety of dietary patterns e.g. Mediterranean, vegetarian, low fat, low carbohydrate, ketogenic and the DASH diet can be used for the management of diabetes.

Public Health Toxicol 2022;1(Supplement 1):A81
DOI: 10.18332/pht/149590

Applications of genetics in prevention and management of type 2 diabetes

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Diabetes is one of the fastest growing diseases worldwide, projected to affect 693 million adults by 2045. The current consensus for the prevention and management of type 2 diabetes (T2D) is that high-quality diets and adherence to a healthy lifestyle provide significant health benefits. Remarkably, however, this consensus alone is not enough and cannot always predict the development of diabetes complications.

On the other hand, numerous genetic studies have demonstrated a clear genetic component to both diabetes and its complications. The explosion of new datasets, both in terms of biobanks and aggregation of cohorts, has more than doubled the number of genetic discoveries for both diabetes and its complications. On the same line, emerging evidence underscores the importance of gene–diet interactions in the improvement of glycemic biomarkers of the disease.

In this workshop, evidence will be provided supporting the concept that we can achieve better glycemic control in T2D patients by coupling Mediterranean diets to genetic information in a personalized manner. Furthermore, a case series of n-of-1 cross-over trials of T2D patients will be presented, of those who have achieved rapid glycemic control when adhered to a personalized, genetically guided Mediterranean diet. Finally, new emerging data concerning the development of polygenic risk scores for T2D will be discussed, that take genomic discovery to the next level of prediction and personalized medicine.

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Public Health Toxicol 2022;1(Supplement 1):A82
DOI: 10.18332/pht/149591

Nutrition screening tools in pediatrics: Practical implementation

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There is ongoing interest in nutritional screening tools in pediatrics which certainly facilitate the identification of children at risk for malnutrition, who need further assessment and possible nutritional intervention. Thus, implementation of a nutritional care process incorporating nutritional screening in clinical practice seems to be of great importance for proper nutrition support. The choice for a specific tool depends on various factors. Furthermore, there is a lack of a universal screening tool of infants and children for nutritional risk. This workshop aims to provide an overview of recent progress in pediatric nutritional screening methods and to present their implementation in clinical practice, in specific pediatric populations such as neurological, cancer etc. as part of the overall process of improving nutritional care in the pediatric settings.

Public Health Toxicol 2022;1(Supplement 1):A83
DOI: 10.18332/pht/149594

The role of hydration in health, disease and performance

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Water is the largest component of the human body. Despite its multiple and critical roles, it is at the same time one of the most under-researched nutrients. Water and electrolyte balance is vital for the functioning of all organs and indeed for maintaining health in general. Recent epidemiological data indicate that hypohydration and/or elevated hydration biomarkers are associated with several adverse health outcomes; like chronic kidney disease, diabetes, urinary tract infections, cardiovascular dysfunction, cognitive impairment and others.

Likewise, maintenance of fluid homeostasis is also important for sports performance and thermoregulation in active individuals. It is well documented that even moderate levels of dehydration increase physiological strain, most likely through disproportionate elevation in heart rate and a concomitant reduction in cardiac output, resulting in the body's inability to dissipate heat. Furthermore, water losses of about 2% of total body weight impair exercise and skill performance significantly, both in laboratories and field studies as well as mental performance, especially under hot environmental conditions provoking ultimately a severe challenge for every athlete.

Public Health Toxicol 2022;1(Supplement 1):A84
DOI: 10.18332/pht/149595

Mindful eating behavior and lifestyle habits for wellness and prevention

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The 1948 WHO Constitution took the bold leap to define health as ‘a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity’. Given that quality of life and longevity may be attained in the existence of chronic disease, it is fundamental to shed light on all factors that affect and improve health and contribute to prevention, and henceforth educate nutrition consultation clients and the public on how to improve their wellbeing and enjoy daily living. A 2022 study on mindful eating behavior and self-compassion among university students, linked both with BMI and wellbeing, with the underweight and obese groups reporting lower self-compassion, less mindful eating attitudes, disordered eating and lower wellbeing. Such findings indicate that self-compassion and mindful eating are useful targets in interventions to prevent both obesity and eating disorders. The duration and quality of sleep in alignment with circadian rhythm, positive dietary choices as a result of self-compassion and mindful eating behavior, as well as physical activity in a feasible and fun way, create an equilibrium called wellbeing that is so easily challenged with aging and modern technological advancements, yet so feasibly controlled with self-willingness and the deserved expert support through mindfulness-related interventions.

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Public Health Toxicol 2022;1(Supplement 1):A85
DOI: 10.18332/pht/149596

The role of mindfulness, mindful eating and intuitive eating in changing eating behaviors: Effectiveness and associated potential mechanisms

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The role of mindfulness, mindful eating and a newer concept of intuitive eating in modulating eating habits and behavior is an area of increasing interest. In this workshop, a summary of the current evidence is presented, together with details of interventions undertaken and the tools to measure outcomes. ‘Mindful eating’ describes a non-judgmental awareness of physical and emotional sensations associated with eating. This workshop reports a mindful eating questionnaire (MEQ) to support rigorous scientific inquiry into this concept. An item pool based on hypothesized domains of mindful eating will be presented. The domains of the final 28-item questionnaire were: Disinhibition, Awareness, External Cues, Emotional

Response, and Distraction. Mindfulness-based approaches appear most effective in addressing binge eating, emotional eating and eating in response to external cues. Mindfulness-based approaches may prevent weight gain. The evidence base for intuitive eating is limited and further research is needed to examine its potential in altering eating behaviors. Mindfulness appears to work by an increased awareness of internal, rather than external, cues to eat. Mindfulness and mindful eating have the potential to address problematic eating behaviors and the challenges many face with controlling their food intake. Mindfulness targets becoming more aware of, rather than reacting to, one’s situation and choices. Eating mindfully means that all of the physical and emotional senses are used to experience and enjoy the food choices made. This increases the gratitude for food, which can improve the overall eating experience. Mindful eating encourages one to make choices that will be satisfying and nourishing to the body. However, it discourages ‘judging’ one’s eating behaviors as there are different types of eating experiences. As a person becomes more aware of his/her eating habits, he/she may take steps towards behavior changes that will benefit the individual and the environment. The aim of this workshop is to identify the interrelations between the mindful eating and the core components of adaptive and maladaptive measures of eating behaviors, and to briefly present a study done in Cyprus regarding mindful eating.

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Public Health Toxicol 2022;1(Supplement 1):A86
DOI: 10.18332/pht/149598

Enteral-parenteral nutrition workshop

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An evidenced based approach will be followed throughout the workshop focused on the ESPEN guidelines on enteral (EN) and parenteral nutrition (PN)¹⁻³. Oral diet shall be preferred over EN and PN in patients who are able to eat, favoring a 'food first' approach. If oral intake is not possible, early EN (within 48 h) in critically ill adult patients should be initiated. In general, indications and contra-indications of EN and PN nutrition will be presented along with their possible side effects. The types of different enteral formulas will be discussed, as well as indications on the dosing, rate and route of administration. In case of contraindications to oral and EN, PN should be implemented within three to seven days. PN options will be discussed. A special reference will be made to the refeeding syndrome and ways to prevent and diagnose it. The workshop will be illustrated with real-life examples/case studies.

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Public Health Toxicol 2022;1(Supplement 1):A87

DOI: 10.18332/pht/149600

The role of diet in functional gastrointestinal disorders (FGIDs)

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Functional gastrointestinal disorders (FGIDs) contribute up to 60% of gastroenterology outpatient appointments. Diagnosis is based on symptoms (abdominal pain and disordered gastrointestinal habits). FGIDs profoundly affect health-related quality of life both in the pediatric population as well as in adults. They are also associated with a significant economic healthcare burden. Studies on the etiology of FGIDs focus on visceral hypersensitivity, immune dysregulation, the GI microbiota, altered regulation of the gut-brain axis, and psychosocial factors.

Diet and nutrition are known to play key roles in many chronic gastrointestinal diseases, regarding both pathogenesis and therapeutic possibilities. According to the patient's opinion, in most FGID cases food intake is considered as a precipitating factor for symptoms, and most of them attribute their symptoms to a specific food. But while diet interventions have been proved beneficial for certain groups such as infants and relevant guidelines have been published, this is not the case for older children and adults. Although there is plenty of information on the association of diet or dietary patterns on the incidence of FGIDs, there is still controversy upon dietary restrictions and other interventions. Nevertheless, personal food-symptom relations may serve as the basis for personalized clinical management.

Public Health Toxicol 2022;1(Supplement 1):A88

DOI: 10.18332/pht/149601

Nutrition support in children and adolescents with cystic fibrosis: Is there a difference between pancreatic sufficient and insufficient patients?

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Cystic fibrosis (CF) is the most common genetically inherited disease among the Caucasian population. Achieving and maintaining a good nutritional status is of vital importance as it has a great impact on improving lung function in these patients¹. Current guidelines² recommend children and adolescents with CF to achieve a BMI \geq 50th percentile through a High-Fat, High-Calorie (HFHC) diet. Although most patients with CF are pancreatic insufficient (PI), approximately 15% of CF patients have pancreatic sufficiency (PS), due to mild CF mutation³. As PS patients are characterized by milder disease severity compared to PI ones, it is not known whether they have different dietary needs, if not lower.

In the current presentation, we will discuss the overall nutritional support of patients with CF, based on the current guidelines. We will also focus on the existing evidence about the nutritional support, weight and metabolic profile of patients with PS. Based on recent epidemiological data, children and adolescents with PS seem to have better weight status and therefore better lung function compared to PI patients⁴. However, their metabolic status (e.g. fat and glucose levels) was worse compared to PI patients.

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Public Health Toxicol 2022;1(Supplement 1):A89

DOI: 10.18332/pht/149602

Bibliographic review of the genetics of food allergies and intolerances

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Food allergies and intolerances are a major issue affecting children and adults. It is a fact that environmental and nutritional changes in recent decades have led to an increase in their global prevalence, but accurate epidemiological data

are lacking. The symptoms of food allergies can be fatal, while those of food intolerances are clearly milder. Their diagnosis is based on a combination of methods to avoid a false positive or negative result, while there is currently no cure for these adverse reactions. They are managed through a diet that excludes the guilty allergens from the daily diet of individuals. It is known that two of the strongest risk factors for the outbreak of food allergies and intolerances are genetic and environmental factors, but also the interaction between them. Genome-wide studies (GWAS) and mapping of genetic variants throughout the genome, usually single nucleotide polymorphisms (SNPs), have made it possible to identify and pave the way for understanding the involvement of these susceptible genes. The HLA, STAT6, SERPINB, SPINK5, FOXP3, IL-10 and FLG genes are the best studied genes associated with food allergies, which will be analyzed in the present dissertation, while the counterparts of food intolerances are LCT, HLA, DAO, ALDOB and CYP1A2.

Given that most diet-related diseases are polygenic, it is easily understood that there are many gaps in genetics that need to be filled. Future studies should consider the environment, genetics and epigenetics, as risk factors in order to clarify the multifaceted etiology and biological mechanisms of food allergies. The genetic information that will be made known in conjunction with the existing knowledge in the science of nutrition will significantly enhance the ability of health professionals to individually design the most appropriate and complete models of prevention and treatment that will greatly improve overall patients' care.

Public Health Toxicol 2022;1(Supplement 1):A90
DOI: 10.18332/pht/149645

Polycystic ovary syndrome: Dietary habits and the likelihood of the occurrence of eating disorders

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Polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders in women of reproductive age. The Mediterranean Diet (MedDiet) is a dietary model that may have beneficial effects on the outcome of the syndrome. In addition, the occurrence of eating disorders (ED) in women with PCOS is a fairly common phenomenon. Aim of this study is to investigate the adherence of women with PCOS to the MedDiet and the risk of developing eating disorders. For this purpose, two questionnaires (MedDiet score and ED Questionnaire) were distributed through social media and data were collected from 1390 women of whom, 50.8% were diagnosed with PCOS. Based on the results of the study, it was shown that women with PCOS have statistically significant higher BMI [$t(1388) = -2.717, p=0.007<0.01$], EDE-Q score [$t(1388) = -4.648, p=0.00<0.01$] and lower MedDiet score [$t(1388) = 3.140, p=0.002<0.01$], indicating that women with PCOS exhibit higher risk of developing eating disorders and lower adherence to MedDiet. Both groups were divided into two subgroups according to age, PCOS and control-young (18–29 years) and old (30–40 years). No significant difference in BMI was shown between the PCOS-young and PCOS-old and between PCOS-old and control-old subgroups. On the contrary, the BMI differed significantly between PCOS-young and control-young and between control-young and control-old subgroups, indicating that PCOS is related to higher BMI only in younger women in accordance with PCOS symptomatology which becomes milder with age. Interestingly, EDE-Q score

followed identical patterns while MedDiet score did not. Overall, our results indicate the increased need for weight control and promoting MedDiet among young women with PCOS, who are at greater risk for ED. However, in order to achieve this efficiently it would be important to understand the reasons why young women with PCOS do not adhere to MedDiet.

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Public Health Toxicol 2022;1(Supplement 1):A91
DOI: 10.18332/pht/149646

Mediterranean diet, ketogenic diet or MIND diet for aging populations with cognitive decline: A systematic review

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Background

Dementia is a leading public health challenge worldwide with no effective treatment nor proven preventive interventions available. Compelling evidence shows that dietary patterns can slow the rate of cognitive decline suggesting diet is a promising preventive measure in the battle against dementia.

Aim

The aim of this systematic review is to summarize the evidence of three dietary patterns, the Mediterranean diet, the ketogenic diet and the MIND diet, on the prevention of cognitive decline. These three diets are known to have antioxidant and anti-inflammatory properties and have been associated with reduced dementia risk and slower cognitive decline.

Methods

A systematic search was conducted in major electronic databases (PubMed, ScienceDirect and Web of Science) up to 31 January 2022, using the key search terms: Mediterranean diet, ketogenic diet, MIND diet, dementia, cognition, and aging. Statistical analysis was performed using RoB 2 and Jadad scale to assess the risk of bias and methodological quality in randomized controlled trials (RCT), respectively.

Results

Only RCTs were included in this study, and specifically 13 studies (n=3523 participants) for the Mediterranean diet, 7 studies (n=372 participants) for the ketogenic diet and 1 study (n=37 participants) for the MIND diet. Participants' cognitive status was normal in 10 studies, 8 studies included patients with mild cognitive impairment, and 3 studies included Alzheimer's disease patients.

Conclusions

All three dietary interventions have been shown to slow the cognitive decline rate in the studies included in this systematic review. Mediterranean diet was shown to be beneficial for global cognition in the shortest time, after 10 weeks of adherence, the ketogenic diet had a beneficial effect in patients with diabetes mellitus improving verbal recognition, while the MIND diet showed benefits in obese patients improving working memory, verbal recognition, memory, and attention.

Public Health Toxicol 2022;1(Supplement 1):A92

DOI: 10.18332/pht/149647

Bone mineral density of elite martial arts athletes in Northern Greece: The effect of physical activity and nutritional indices and habits

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Aim

Bone mineral density (BMD) is a measure of bone quality. Several factors affect BMD. The aim of this study was to investigate the effect of anthropometric characteristics, type of martial arts, physical activity, and dietary habits on BMD of elite martial arts athletes in Thessaloniki region, Northern Greece.

Methods

Data collection was performed through anthropometric measurements, body composition analysis and a questionnaire completion. BMD was measured using Dual-Energy X-ray Absorptiometry. The sample consisted of 32 elite athletes. Statistical analysis (ANOVA, Regression Analysis, etc.) was performed using IBM SPSS Statistics v26.0.

Results

The mean age of the sample was 17.00±1.77 years; 71.9% of athletes were males and 53.1% were training in wrestling. The measurements of BMD in lumbar spine (L1-L4) (\bar{x} =1.28), BMD in left and right dual femur (\bar{x} l=1.27 and \bar{x} r=1.28) and BMD in left and right forearm (\bar{x} l,r=0.72), were examined. The mean

values of BMD in lumbar spine and in right dual femur were almost equal between males and females. Instead, the mean values of BMD in left dual femur and in left and right forearm were higher in males. There were positive correlations of BMD with age, Body Mass Index (BMI), Fat-Free Mass Index (FFMI) and daily energy expenditure. For instance, based on one of the multiple linear regression models, if BMI and FFMI increased by 1 unit, BMD in right dual femur increased by 0.010 and 0.014 units, respectively. Greco roman wrestling athletes had higher BMD than all the others. The interaction of diets for losing and gaining weight was statistically significant for BMD in right dual femur.

Conclusions

BMD is beneficially affected from high impact exercise like martial arts, anthropometric characteristics and dietary habits, which makes it a useful predictor for athletes' health.

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Public Health Toxicol 2022;1(Supplement 1):A93

DOI: 10.18332/pht/149651

Impact of social networking media on the eating habits of young Greek and foreign adults

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The increasing use of social media by young adults is indisputable. The effects of this phenomenon begin to reflect the dietary choices of young age groups including Greeks. These new eating habits might affect their health.

The purpose of the present study was to investigate whether social media influence the eating habits Greeks and other nationality young adults, in regard to dietary recommendations and the consequences that may occur.

Data were collected by answering anonymously an online questionnaire, from January to March 2021. The respondents were 823 people (563 Greeks and 260 of different European nationalities), aged 18–27 years (78.4% female, 21.3% male, and 0.4% other). Pearson's chi-squared test was used to analyze the relationship between variables. The data were analyzed with SPSS at p<0.05 significance level.

The analysis of the relationship between ethnicities and eating habits in relation to the recommendations of the National Nutrition Guides (2014), showed that the consumption of red meat (p=0.000), meat products (p=0.000), fish (p=0.000), dairy (p=0.012), legumes (p=0.000), oil/olives (p=0.035) differed statistically significantly. In terms of ethnicity-related social media, there was a statistically significant difference in young people who were following a diet seen on social media (p=0.035) and bought food products through social media (p=0.000). Besides, the analysis of the relationship between

BMI and social media indicated that some participants were seeking nutritional advice on social media ($p=0.024$) and the young adults feeling pressure from social media were thin ($p=0.001$).

This study indicated that social media might be a factor influencing young people's choices regarding their eating habits.

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Public Health Toxicol 2022;1(Supplement 1):A94

DOI: 10.18332/pht/149648

The effect of gut microbiota on the development of obesity: Knowledge and attitudes of nutritionists in Greece

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Introduction

Recently, the role of the gut microbiome has become increasingly well known in the scientific community and its term in human health has been investigated, as well as its interaction with nutrition and the occurrence of obesity.

Aim

This study aims to investigate the knowledge of nutrition experts in Greece regarding the effect of the gut microflora, as well as the attitude regarding the practical application of this knowledge to their patients and how they are using this information to help their clients.

Methods

For the purpose of the study, a questionnaire was filled in by a random sample of 122 nutritionists. The applicants had to answer 26 questions which were related to demographics, their knowledge about the gut microbiota, related to obesity and diet, the corresponding recommendations given to clients and their willing to be informed for this topic. The results were analyzed in Microsoft Excel and IBM SPSS Statistics 21 including a chi-squared test.

Results

It seems that young adults have more knowledge about the intestinal microbiota, its relationship with nutrition and obesity and are willing to learn more on this topic. The majority of those who have more years of experience, but also those who have higher education (PhD) than the rest, seem to take more into account the gut microflora in the practical part of the profession. Finally, the results show that participants, who have been informed about the role of gut microbiota in health, have more knowledge about its relation to diet and obesity.

Conclusions

The participants were well informed about the new data concerning the intestinal microbiome, but not sufficiently. It appears that age, years of experience, education and knowledge about gut microbiota affect importantly their responses and it also seems that there is the will to gather further information.

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Public Health Toxicol 2022;1(Supplement 1):A95

DOI: 10.18332/pht/149649

Study on the influence of the ingredients in the packaging in consumers' perceptions of processed food

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The purpose of this study was to investigate how the ingredients listed on the food packaging label affect consumer's perceptions of food, as well as to study how familiar these ingredients are to the consumer.

Data were collected by completing a questionnaire via online communication from 10 May 2020 to 1 June 2020 in the middle of the first quarantine due to the COVID-19 pandemic. The respondents were 205 people, 78% women and 22% men. Pearson correlation and Kendall's tau-b were computed to measure the association between variables.

The results showed that 70.8% of the participants were able to read the label, 44% believed that they were able to understand the written information on the label, while only 18% stated a weakness. Presenting only the listed packaging ingredients of four blind products, the respondents were asked to answer whether they would buy them. The most common answer (30.1%) was 'neither possible nor unlikely'. However, comparing the participants' responses when presented with ingredients from blind foods, with those from foods known to them, a statistically significant difference ($p<0.05$) was observed between their preferences (toast bread $p=0.018$, biscuits $p=0.019$, hazelnut praline $p=0.004$, turkey $p=0.002$). Also, 83% of the participants recorded awareness of the packaging listed macronutrients.

In conclusion, the present study indicated observed ability distinguishing foods with low or high content of essential nutrients, in line with skepticism about choosing products with ingredients contained even in foods of daily consumption.

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Public Health Toxicol 2022;1(Supplement 1):A96
DOI: 10.18332/pht/149650

The role of MitoQ-a mitochondria-targeted antioxidant in insulin resistance of skeletal muscle fibers

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Recent studies show that the mitochondrial targeted antioxidant mitoquinone (MitoQ) reduces mitochondrial oxidative stress and prevents impaired mitochondrial dynamics. Focusing on the concept of mitochondrial reactive species as redox signaling molecules in insulin resistance rather than oxidative molecular damage as part of the 'oxidative stress', we wished to examine the role of MitoQ, a mitochondrial antioxidant in the delivery of GLUT-4 translocation in skeletal muscle fibers. MitoQ is a shortened form of the antioxidant ubiquinol (a CoQ10) and is designed to be adsorbed to the inner mitochondrial membrane, as a potential therapeutic targeting mitochondrial. To study the hypothesis of improved GLUT4 translocation we used a genetically encoded biosensor GLUT4-7mycGFP plasmid in mouse skeletal FDB muscle. After the transfection (7 days), single FDB fibers were induced to insulin resistance by treating them with ceramides for twenty hours. After three-hour starvation, insulin stimulation combined with MitoQ treatment was done to study GLUT4 movement in the membrane of the fat-induced fibers. Interestingly, microscopy image analysis showed that the clear increase in surface-exposed GLUT4 content induced by insulin were improved in the fibers treated with MitoQ compared to Control. In conclusion, MitoQ had positive effects related to GLUT4 translocation and improved glucose tolerance. Although many studies have suggested that mitochondria-targeted antioxidants may be worth considering as potentially helpful therapies, more research needs to be done to recommend their use in patients with insulin resistance.

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Public Health Toxicol 2022;1(Supplement 1):A97
DOI: 10.18332/pht/149653

Effect of periodic religious fasting on body composition and nutrient intake in menopausal women

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Aim

Studies regarding health effects of religious fasting have been

increased during the last decade. Our aim was to investigate whether adherence to the primarily plant-based periodic fasting according to the Christian Orthodox Church (COC) recommendations has an impact on body composition and nutrient intake in menopausal women.

Methods

Ninety-one women aged 60.46 ± 5.90 years from Northern Greece participated in this cross-sectional study. Two in three women abstained from red meat and its products, poultry, dairy products and eggs for approximately half of the year. Socioeconomic data, lifestyle habits and physical activity data were collected using validated questionnaires. Nutritional assessment was performed through two 24-h recalls and a Food Frequency Questionnaire. Height, weight, waist and hip circumference, body composition via bioelectric impedance and resting metabolic rate were measured.

Results

Menopausal women who followed the COC fasting recommendations had statistically significant lower carbohydrate intake (173.74 vs 240.98 g, p=0.039), lower total sugar (61.47 vs 99.8 g, p=0.010), lower fat (64.83 vs 78.72 g, p=0.050) and lower saturated fat (17.86 vs 22.21 g, p=0.046) intake, compared to those who did not follow any specific dietary abstinence. Groups did not differ in vitamin and mineral intake (p>0.05). Anthropometric measurements, including body weight, body fat, trunk fat and resting metabolic rate did not have a statistically significant difference (p=0.270, p=0.226, p=0.196 and p=0.680, respectively).

Conclusions

Menopausal women who adhere to the COC fasting regime for approximately half of the year, follow a plant-based food dietary pattern characterized by lower carbohydrate, protein and fat intake, compared to non-fasters. Despite this, periodic abstinence from red and white meat, dairy products and eggs had no effect on nutrient intake and anthropometrics.

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Public Health Toxicol 2022;1(Supplement 1):A98
DOI: 10.18332/pht/149654

Long-term metabolic and inflammatory effects of second-generation antipsychotics: A study in mentally disordered offenders

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This article combines forensic psychiatry, antipsychotics drug and metabolic disturbances. It refers to mentally disordered offenders provided with forensic psychiatric care that are often

treated with second-generation antipsychotic medication and experience metabolic and inflammatory side effects. Three-year variability of selected anthropometric, biochemical and inflammatory markers was monitored in forensic psychiatric patients receiving antipsychotic (AP) medication for more than five years, according to the type of AP. Thirty-five patients with psychotic disorders were classified into two groups based on the type of AP. Specifically: AP1, related to a lower risk, and AP2, related to an increased risk of weight gain and metabolic complications. Biochemical, hematological, anthropometric, blood pressure, and medication data were retrieved from the individual medical files. No significant differences in weight and glucose and cholesterol levels were observed, but patients taking AP2 more often needed drugs to control diabetes mellitus, lipidemia, and cardiovascular disease. In those taking AP1, the mean HDL level decreased significantly over time ($p < 0.05$) and a higher proportion developed higher blood pressure (52.9% of AP1 vs 16.7% AP2). In the AP2 group the median level of C-reactive protein ($p < 0.001$) and the white blood cell count increased over the three years ($p < 0.001$).

Public Health Toxicol 2022;1(Supplement 1):A99
DOI: 10.18332/pht/149655

Effects of long-term second-generation antipsychotics use in liver and kidney function

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Background

Mentally disordered offenders provided with forensic psychiatric care are often treated with second-generation antipsychotic medication (AP) and experience metabolic and inflammatory side effects. Disturbances in liver and kidney function are referred in literature, with main focus on those provoked by the first generation.

Aim

The aim of the current investigation was to study the three-year fluctuation of selected liver and kidney function markers in forensic psychiatric patients receiving antipsychotic (AP) medication for more than five years, according to the type of AP.

Methods

Thirty-five patients with psychotic disorders were classified into two groups based on the type of AP. Specifically: AP1, related to a lower risk, namely aripiprazole, amisulpride, quetiapine XR, paliperidone, and ziprasidone, and AP2, related to an increased risk of weight gain and metabolic complications, namely olanzapine, aripiprazole, clozapine and risperidone. Medication and biochemical data relevant to liver and kidney function were retrieved from the individual medical files, specifically: urea, uric acid, creatinine, SGOT, SGPT, γ -GT, alkaline phosphatase, and amylase.

Results

AP1 group of patients did not differ significantly in any biochemical substance over time. Both overall between the three time periods and in each pair of periods, the patients of the AP1 group presented approximately the same pattern to each biochemical feature. On the other hand, patients in

the AP2 group differed significantly in uric acid ($p = 0.015$), SGOT ($p = 0.018$) and SGPT ($p = 0.051$) levels in at least one measurement compared to the others. Specifically, patients showed significantly higher uric acid in the third time period than in the second ($p = 0.014$). It is worth noting that despite the apparent equality of creatinine values between the three time periods, it was observed that patients in the AP2 group showed significantly higher creatinine in the third time period compared to the second ($p = 0.029$). Furthermore, SGOT levels for this group (AP2) of patients were significantly higher in the second time period compared to the first ($p = 0.038$). Finally, patients showed significantly lower levels of SGPT in the third time period compared to the second period ($p = 0.024$). In each case, the values of the biochemical characteristics in each of the three time periods are reflected by the mean or median value calculated in each case.

Conclusions

AP2 antipsychotics are more relevant to liver and kidney dysfunction. Therefore, the strategy behind choosing an antipsychotic drug should consider its hepatotoxicity and kidney damage, in addition to other complications, such as cardiovascular disease, obesity and metabolic syndrome.

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Public Health Toxicol 2022;1(Supplement 1):A100
DOI: 10.18332/pht/149657

Development and in vitro digestion analysis of kefir fortified with by-product extracts: Prediction of total antioxidant and phenolic compounds bioavailability

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Background

Moving forward to a sustainable nutrition and as studies have shown, food byproducts are a source of bioactive compounds that could be used for the production of novel functional foods.

Aim

Our study aims to: 1) determine total antioxidant and phenolic content and predict their bioavailability (BAV%) in byproduct

extracts from bitter orange, lemon and rosehip; and 2) develop a kefir product fortified with byproduct extracts.

Methods

Samples (peels and seeds) were collected and dried in an air oven. Water extracts were obtained from 10 g of each sample into 100 mL of distilled water in ultrasonic bath, followed by filtration. The extracts were analyzed with in vitro digestion method and total antioxidants and phenolics were determined with FRAP assay (expressed as mmol of Fe²⁺/L), and Folin-Ciocalteu assay (expressed as gallic acid (GAE)/g of dried sample), respectively. Extracts were finally added to kefir and the above bioactive compounds were determined in the new product.

Results

Antioxidant and phenolic content of bitter orange peel and rosehip seeds (BoR) was 21.87 ± 1.41 Fe²⁺/L and 67.07 ± 1.67 GAEs/g while for bitter orange and lemon peels (BoL) was 12.11 ± 0.41 Fe²⁺/L and 47.92 ± 2.10 GAE/g, respectively. After digestion total antioxidants were 3.70 ± 0.50 Fe²⁺/L for BoR (18% BA_{VI}) and 3.85 ± 0.35 Fe²⁺/L for BoL (32% BA_{VI}) while phenolic content was 5.95 ± 2.69 GAE/g (10% BA_{VI}) and 7.42 ± 2.75 GAE/g (15% BA_{VI}), respectively. Antioxidant content of kefir fortified with BoR was 0.37 ± 0.15 Fe²⁺/L and with BoL 0.35 ± 0.12 Fe²⁺/L while their phenolic content was 3.33 ± 1.72 GAE/g and 1.49 ± 0.75 GAE/g, respectively.

Conclusions

BoR presented high bioavailability of total phenolics and therefore can be used for the fortification of kefir products in a concentration up to 27% w/w.

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Public Health Toxicol 2022;1(Supplement 1):A101

DOI: 10.18332/pht/149660

Exploring the impact of the Mediterranean diet on the gut microbiome of individuals with multiple sclerosis

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Introduction

Multiple Sclerosis (MS) is an inflammatory immune-mediated disease of the Central Nervous System. Recent studies have linked alterations in the overall profile of the gut microbiome with MS, as well as with the activity of the disease. Here, we aim to evaluate the potential effect of Mediterranean Diet (MedDiet) on the gut microbiome in a cohort of patients with a first demyelinating episode in the context of Clinically Isolated Syndrome (CIS) and/or Relapsing-Remitting MS (RRMS).

Methods

This ongoing study includes 31 patients with a first demyelinating episode and 27 age, sex and BMI matched Greek individuals. Fecal samples were profiled using 16S

rRNA sequencing (V3/V4 regions). Microbial sequences were clustered into operational taxonomic units and aligned to SILVA132 database. Dietary intake was assessed using a validated semi-quantitative FFQ. Adherence to MedDiet was assessed using a nine-item composite index, the Mediterranean Diet Score (MDS), and subjects were classified into two dietary groups according to the median MDS. Data analyses were conducted using in-house R scripts.

Results

MDS did not statistically differ between healthy people and patients, however, patients consume less servings/day of vegetables and red meat compared to the healthy individuals. Alpha diversity of the gut microbiome was similar across dietary groups in both healthy people and patients with a first demyelinating episode. Principal coordinate analysis based on Bray-Curtis dissimilarity revealed that MDS and disease status are significantly covaried with the gut microbiome diversity, although they explained a modest proportion of variance. Among patients, differential abundance testing across dietary groups revealed association of greater adherence to MedDiet with abundance of specific previously reported beneficial microbial genera, including *Prevotella* and *Faecalibacterium*.

Conclusions

Our preliminary data provide evidence of a potential role of MedDiet in modulating gut microbiota composition in people with a first demyelinating episode, thus elucidating possible promising intervention approaches.

Public Health Toxicol 2022;1(Supplement 1):A102

DOI: 10.18332/pht/149661

Evaluation of adherence to the MIND diet against cognitive decline in elderly Greek population

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Background

Dementia prevalence has increased worldwide with no effective treatment available¹. Dietary patterns are known to protect against dementia risk^{2,3}. MIND diet is a hybrid of the Mediterranean and DASH diets and have been shown to reduce cognitive decline and dementia occurrence^{4,5}.

Aim

We investigated for the first time the effect of MIND diet on cognitive function in dementia development in Greek elderly population.

Methods

The study consisted of 218 older adults referred to Alzheimer's Disease center, divided into two groups: 1) with a suspicion of dementia, and 2) without dementia. Participants were categorized according ICD11 into: healthy subjects, mild mental disorders, dementia and Alzheimer's disease. Cognitive impairment was measured using the Mini-Mental State-Examination (MMSE). Functional-Cognitive Assessment Scale (FUCAS) was administered to evaluate executive function affecting the execution of daily life activities. Dietary habits were assessed using the MIND Diet Food Frequency Questionnaire. Emotions were evaluated using the Depression Anxiety Stress Scale (DASS21). Weight and height were measured by standard procedures. Statistical analysis was conducted with the R programming language and a logistic

regression model was applied to predict the development of dementia.

Results and Discussion

In group 1, n=127 participants (86 women) were assigned, with a mean age of 72.00 ± 7.56 years and with a BMI of 28.2 ± 4.62 . In group 2, n=91 participants (59 women) were assigned, with a mean age of 70.42 ± 4.65 years and with a BMI of 26.72 ± 3.14 . Preliminary analysis suggests that the MIND diet could be a possible measure against cognitive impairment and prevention of cognitive decline in the Greek elderly. Anxiety seems to be correlated with and affects female gender, indicating that gender-related interventions should be explored further.

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Public Health Toxicol 2022;1(Supplement 1):A103

DOI: 10.18332/pht/149662

Phenolic analysis and in vitro biological activity of red wine, pomace and grape seeds oil derived from vitis vinifera L. Cv. montepulciano d'Abruzzo

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Grape pomace is commonly considered a waste product of monovarietal red wine production¹. HPLC-DAD analysis was performed to determine the polyphenol and flavonoid contents of all the extracts obtained from Montepulciano d'Abruzzo red wine and grape skins, whereas GC-MS was applied to the determination of fatty acid composition in grape seeds oil. Biological characterization involves antioxidant and antimicrobial assays for all the extracts and seeds oil. Their ability to inhibit α -glucosidase, α -amylase, α -tyrosinase, and ChE enzymes was also detected, together with anti-inflammatory activity on wine, grape skin extracts, and seeds oil by lipoxygenase (5-LOX) and LPS-stimulated macrophage release assays. Data indicate significant polyphenols content (199.31 ± 7.21 mgGAE/g), antioxidant [CUPRAC assay (1036.98 mgTE/g)], enzymatic inhibition (α -tyrosinase: 151.30 ± 1.20 mgKAE/g) and anti-inflammatory activities for wine-organic extract², while the antimicrobial activity of grape skin decoction is higher than those reported by wine extracts on three bacterial strains. Interestingly only dealcoholized wine and wine-aqueous extract exerts inhibitory effects on α -glucosidase (20.62 ± 0.23 mmolACAE/g and 19.81 ± 0.03

mmolACAE/g, respectively), while seeds oil is rich in oleic and linoleic acids². These results confirm the strong antioxidant properties of Montepulciano d'Abruzzo grape pomace, suggesting the potential use of this waste product as functional food supplements in the human diet and in cosmetics.

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Public Health Toxicol 2022;1(Supplement 1):A104

DOI: 10.18332/pht/149665

Nutritional prevention of cognitive impairment through dietary patterns and its correlation with sarcopenia

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Introduction

There is a link between sarcopenia and dementia. Sarcopenia could be involved in the pathophysiological process of the cognitive impairment. Diet is a potential lifestyle factor that could modify the risk of cognitive dysfunction and dementia because sufficient nutrients intake and dietary food patterns seem to have a protective role in cognitive ability of the elderly. The association between diet and cognitive outcomes is stronger for healthy dietary patterns, such as the Mediterranean diet, rather than individual nutrients.

Aim

The aim of this study is to examine the role of diet and dietary patterns in cognitive decline and the correlation between sarcopenia and cognitive dysfunction.

Methodology

This cross-sectional study included 128 subjects (of mean age 72.4 ± 7.4 years, 24.2% male) with mild dementia. BIA method was used for body composition analysis. In addition, hand strength and gait speed were measured. EWGSOP 2 criteria were used to define sarcopenia. Moreover, Mini Mental State Examination, Mini Nutritional Assessment and Mediterranean diet score were used to assess cognitive function, nutritional status, and to estimate the degree of adherence to the Mediterranean diet, respectively.

Results

According to our results, 10.2% were sarcopenic (8.6% sarcopenic and 1.6% severely sarcopenic), 30.5% probably sarcopenic, and 59.4% non-sarcopenic. No significant difference was observed between sarcopenia and cognitive impairment ($F=2.52$, $p=0.06$). Post hoc Bonferroni test showed that there was a statistically significant difference in cognitive impairment between people with possible sarcopenia and those without sarcopenia ($p=0.046$). Furthermore, Pearson correlation showed a tendency for a negative correlation

between malnutrition and cognitive impairment ($r = -0.177$, $p = 0.057$).

Conclusions

People with possible sarcopenia have a higher risk of cognitive impairment than non-sarcopenic people, demonstrating the association between sarcopenia and dementia. Also, malnutrition causes a negative effect on cognitive impairment.

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Public Health Toxicol 2022;1(Supplement 1):A105

DOI: 10.18332/pht/149666

Mindful eating: A values-based approach in eating behavior

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Mindful eating is the non-judgmental awareness of physical and emotional sensations while eating or in a food-related environment and can be defined as the practice of enjoying food with understanding and compassion. The practice of mindful eating develops an awareness of the relationships between food and our body, our feelings, our mind and the interconnectedness of all these aspects.

Examining our relationship to food can provide a valuable picture into how the most basic processes of the body, become highly conditioned and enveloped within constructed meaning. It is extraordinarily common in our food-abundant society for 'unwise' eating patterns to develop and become entrenched, resulting in eating disorders and obesity.

Dietary regimes rely on external rules or avoiding 'bad' foods, which leads to weight obsession, disordered eating patterns, body dissatisfaction, lower self-esteem and an increase of body weight over time. Dieting is associated to poor awareness of psychological and physiological states, such as bodily hunger and an inability to recognize motivations to eat.

The emphasis only on calories or nutrients, takes people away from the ingredients, processing methods, quality of their foods, and the holistic nourishment. It is a barrier to creating an authentic relationship with food.

A number of factors can affect a person's ability to flourish, including low self-esteem, a lack of self-acceptance or by experiencing disorder eating behavior. Values-based approach recognizes that a person's social environment and personal relationships can greatly impact in eating behavior.

The mindful self is feeling, sensing and experiencing, as opposed to the place where we are being driven by our narratives, our conditioning, and our critical voices. If a person can be aware of his instinctual desires and emotional needs, he can enjoy himself, his life and his food. Health, is the outcome of living well and finding balance in life.

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Public Health Toxicol 2022;1(Supplement 1):A106

DOI: 10.18332/pht/149667

Design of biphasic structures for replacing saturated fats in food systems

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Driven by the need for trans- and saturated-fat replacement, much research has been done on fat substitutes for food products¹. The excessive consumption of high-fat products has been linked with health problems, such as obesity, cardiovascular diseases, and metabolic syndrome. Bigels are biphasic systems consisting of a hydrogel and an oleogel, that could be utilized as promising substitutes of animal fat, allowing for the reduction of total fat and cholesterol content². However, reducing the fat content in foods and specifically in meat products may result in undesirable sensorial characteristics³.

The Aim of the study was to evaluate the properties of oleogel-in-hydrogel bigels and the effect of the 50% substitution of the pork back fat by the bigels in fermented sausages. Bigels were prepared by mixing oleogels structured with 15% monoglycerides and hydrogels structured with 10% gelatin or 10% gelatin plus 1% κ -carrageenan in different mixing ratios (40/60 and 20/80). The textural characteristics and swelling capacity of the bigels were studied. Also, the physicochemical, microbiological, and nutritional characteristics of fermented sausages with bigels were evaluated and compared to control. Bigels with a higher oleogel ratio exhibited increased cohesiveness and decreased hardness, while the incorporation of κ -carrageenan into the hydrogel led to enhanced hardness. The pH values and the weight losses were higher in fermented sausages with bigels compared to the control. Fat substitution did not affect the microbiological characteristics of the sausages. The finished products with bigels exhibited better

nutritional characteristics, showing a decrease in total energy, saturated fatty acids, and cholesterol content.

The use of bigels as pork back fat substitutes in fermented sausages and generally in foods with a high-fat content permits high substitution levels, as the finished products' nutritional characteristics are improved.

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Public Health Toxicol 2022;1(Supplement 1):A107

DOI: 10.18332/pht/149613

Toxic effects of polyethylene-microplastics on freshwater fish species: Implications for human health

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Continuing usage of plastics worldwide has induced global concern of their environmental impact on biota¹. Among the variety of polymers used, eight constitute up to 95% of all primary plastics, among which polypropylene (PP) and polyethylene (PE) comprise 45–50% of the global production². Hence, PE microplastics (PE-MPs) are among the most commonly found in the environment³. Fish ingest MPs depending on their feeding ecology⁴. Due to the significance of size in MPs induced toxicity to fish⁵, the present study's purpose was to verify the particle-size dependence of fish response to MPs. Thus, we exposed two freshwater fish species, zebrafish (*Danio rerio*) and perch (*Perca fluviatilis*), for 21 days to PE-MPs sized 10–45 µm and 106–125 µm. Thereafter, biochemical parameters and the metabolic profile were examined in liver and gills. Ex vivo characterization by ATR-FTIR spectroscopy exhibited increased 10–45 µm PE-MPs concentration in the liver of both species, while 106–125 µm PE-MPs mostly concentrated in gills. The induced

oxidative stress triggered changes in lipid peroxidation, DNA damage and ubiquitination and stimulated signal transduction pathways leading to autophagy and apoptosis. Smaller PE-MPs were more potent than the larger ones. In perch, the metabolic changes in gills followed a size dependent pattern, indicating that stress conditions are generated through different mechanisms. Taking into consideration the fact that MPs ingestion has been reported in more than 150 marine and freshwater fish species⁶, that MPs are incorporated through food transfer⁷, and thus MPs induced toxicity to fish is observed across multiple trophic levels⁵, it becomes apparent that MPs constitute a new pollutant that may enter the human food chain posing a threat to public health.

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Public Health Toxicol 2022;1(Supplement 1):A108

DOI: 10.18332/pht/149614

Studying sustainable diets with bibliometric analysis for the past thirty-five years

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Introduction

Thirty-five years have passed since the first introduction of the term 'sustainable diets' (SDs) in the scientific literature (1986)¹. FAO defined the term in detail at the Declaration of the World Summit (2010)². Throughout that period (1986–2021), multiple international events (summits, conferences, working groups, agreements) took place and offered knowledge transfer, communication between experts and policy frameworks. In the present study, we describe the ongoing 'dialogue' concerning SDs, through a methodical review and assessment of the literature. Our goal is to detect temporal trends and turning points of the term 'Sustainable

Diets³, to detect the collaboration among countries, and identify the role of international organizations and treaties to the production of scientific literature.

Methods

Given the continuous increase of studies related to SDs, a bibliometric analysis was conducted using a modified version of PRISMA 2020 Statement protocol. In total, more than 11000 scientific documents were published during the period 1977–2024 that were detected in SCOPUS bibliographic database after a designed keyword strategy. The data were extracted, filtered, screened, and the duplicates were removed using R programming. A bibliometric analysis was conducted using the Bibliometrix package in R⁴ and the VOSviewer software⁵ and various bibliographic maps were created.

Results

The results obtained confirmed the exponential growth of scientific interest in the subject area. The turning points in the evolution of the publications follow the international timeline of events. Furthermore, COVID-19 was highlighted as one of the trend topics due to the pandemic, while others (e.g. agriculture) are studied for a decade.

Conclusions

Taking under consideration the key components of SDs, the greatest emphasis of the scientific community was given to sustainability, nutrition, food security, obesity, and health. Aquaculture, climate change, agriculture, food, and food systems are some of the themes that rise the interest of scientists.

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Public Health Toxicol 2022;1(Supplement 1):A109

DOI: 10.18332/pht/149618

Does physical activity increase life expectancy and has an anti-aging effect at the cellular level? Anti-aging benefits of exercise: A review of the literature

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Introduction

Inflection of Klotho expression through aerobic exercise

training represents an interesting relationship that may contribute to the explanation of the anti-aging effects of long-lasting aerobic activity. The purpose of this review was to synthesize the literature on life expectancy in relation to physical activity.

Methods

To identify all relevant articles about cohort studies investigating the life expectancy, a systematic literature search was conducted in the electronic bibliographical database PubMed.

Results

All studies reported a higher life expectancy in physically active subjects, ranging from 0.43 to 6.9 additional years (men: 2.9 ± 1.3 years, women: 3.9 ± 1.8 years). Eleven studies considered confounding factors that could affect life expectancy, such as body mass index, blood pressure, diabetes mellitus, dyslipidemia, cardiovascular and lung diseases, cancer, smoking, or alcohol consumption. The additional life expectancy in physically active compared to inactive persons in these studies ranged between 0.43 and 4.21 years (2.7 ± 1.1 years). The physically most active groups, included in the estimations of life expectancy, participated in moderate to high leisure time or leisure time and all-day activities. Physical activity during leisure time seems to increase life expectancy more effectively than total physical activity (all-day or leisure time activity altogether): 3.4 added years due to total activities and 4.7 added years (median values) due to leisure time activities in women, 1.9 and 3.9 added years, respectively, in men.

Conclusions

Acute aerobic exercise significantly increased the circulating Klotho levels, suggesting that long-lasting aerobic training may be appropriate for mechanistically probing the role of physical activity on s-Klotho expression.

Public Health Toxicol 2022;1(Supplement 1):A110

DOI: 10.18332/pht/149641

Nutrigenetic tests: Knowledge and attitude of the Greek public

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Nutrigenetic Tests (NTs) detect single-nucleotide polymorphisms (SNPs), which are genetic variations in the DNA sequence, and are considered to be a very valuable tool for precision nutrition.

The purpose of the present study is to investigate the knowledge and attitude of the Greek public regarding the application of NTs, and in general their knowledge of nutrigenetics.

A questionnaire was used with 29 questions about the demographic characteristics, knowledge, attitude and interest. The sample was random and consisted of 400 adults from all over Greece, mostly women, aged 18–60 years. The largest percentage of the sample was aged 18–25 years, 38.3% were students in general and 19% were students of Health Sciences or Health Professionals. Most seemed to follow healthy eating patterns to a satisfactory degree in their daily lives, while their main means of information about nutrition was the Internet. Furthermore, 69% of respondents did not know what a NT is, but almost all said they would like to be informed. Also, 61.3% stated that they would make a NT on the recommendation of a Health Scientist. The majority considered that the cost of a NT is a deterrent and they almost unanimously stated that if the state provided it free of charge, they would reconsider. Almost

two-thirds seemed to not be worried in case of side effects, nor for the protection of personal genetic data. More than half expressed a point of view that the NT will have a positive effect on their personal and public health expenses.

In general, a positive response was found both in the desire for information and in the execution of an NT. However, the need for further education and training on nutrigenetic matters, and in particular for the utility of NT, is emphasized.

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Public Health Toxicol 2022;1(Supplement 1):A111
DOI: 10.18332/pht/149642

Greek consumer attitudes towards dietary supplement use: The impact of education level and physical activity

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Introduction

During the last decades, dietary supplements (DS) use has increased globally. It has often been associated with demographic factors, such as the level of education (LE) and physical activity (PA). However, information on Greek consumers is limited.

Aim

The aim of this study was to investigate the Greek consumer attitudes towards DS use, in relevance to LE and PA. Specifically, the frequency and reasons for use/non-use of DS, types of DS, consumers' knowledge, opinions, and behaviors towards DS were examined.

Methods

Data collection was performed through an in-person questionnaire completion from 31823 Greek consumers. Data digitization and transportation were performed by Microsoft Excel. The statistical analysis (Pearson's chi-squared test, Z-test, correlation analysis) was performed using SPSS.

Results

History of DS use reached 56.4% and it was more prevalent among exercisers (61.2% vs 50.2%, $p < 0.05$), and positively related to LE (37.4–64.2%, $p < 0.05$). The 'good physical condition', as a non-usage reason, and the 'improvement of

physical condition', as a usage reason, were more frequently selected by exercisers and those with higher LE. However, the 'fear of side-effects', as a non-usage reason, and the 'treatment of disease', as a usage reason, were more frequently selected by non-exercisers and those with lower LE. Exercisers and those with higher LE agreed more frequently that 'DS are generally safe', and also considered more frequently the recommended daily allowance. However, only half of the respondents declared awareness of the DS overuse dangers.

Conclusions

Exercisers and higher educated consumers, consider DS use as 'supportive' of their healthy lifestyle, while non-exercisers and consumers with a lower LE as 'therapeutic'. Nonetheless, there seems to be fertile ground for guidance of consumers, regardless of PA and LE, from healthcare professionals to prevent imprudent use of DS.

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Public Health Toxicol 2022;1(Supplement 1):A112
DOI: 10.18332/pht/149643

Bibliometrics measurements in nutrition informatics

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Introduction and Aim

We use bibliometric methods in order to investigate the growing association and interconnection of Informatics and Nutrition.

Bibliometry is a specific field of statistics that analyzes and studies scientific activity by using bibliometric indicators. These indicators used to evaluate the research performance of individual researchers and scientists include production and impact measures. Bibliometry, also, can help young scientists to identify areas where there is a lot of activity and therefore a lot of literature, as well as areas where the literature is limited so there is room for further investigation.

Nowadays, several informatics applications are used successfully in the field of Nutrition and Dietetics. The most important of these includes terms such as nutrition, software, informatics, applications, food, databases, system management, composition databases, surveillance systems, nutrition ontologies etc. that serve the science of Nutrition and Dietetics.

Methods

By using an intelligent calculation mechanism based on Python, we measure the productivity, on a weekly basis, of scientific articles, concerning combinations of the above terms related of Nutrition and Informatics. Our investigation focuses on Central Pubmed database. Index of productivity, a very important indicator for Bibliometry, is the base for calculating other very important indicators for relative analysis, in

order to calculate the impact of an individual researcher or an institute in the scientific community. Productivity index counts the number of articles published in scientific journals during a specific time frame.

Results

The research shows the increasing production of articles on various combinations of the above terms. We measured in which combinations of these terms there is a greater increase in research articles production and furthermore we investigated the weekly and monthly variations of this production. Terms such as nutrition software, food service and system management seem to have the highest production, while the lowest production appears in terms such as nutrition ontologies and nutrition informatics. The weekly and monthly variation on research articles production is increasing in terms such as food databases, food service and system management (with a fairly large slope) and decreasing in terms such as nutrition ontologies and food composition databases. For other terms such as nutrition informatics and food supply surveillance, the weekly and monthly variation shows stability with the slope being almost zero and so the trend line being almost horizontal.

Conclusions

This process is very useful because it demonstrates the impact of Nutrition Informatics on the scientific community research interests and also shows which areas are developing faster. As a future work we want to improve our method and extend the measurements in a bigger time-frame and in various scientific databases.

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Public Health Toxicol 2022;1(Supplement 1):A113
DOI: 10.18332/pht/149644

Food content in children's animated programs: A review

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Research has shown that messages conveyed to children via food advertisements influence their perception of food; however, the food content of comic series addressed to children is poorly explored. We conducted a review to examine which particular foods are present in films and series addressed to children. Five electronic databases (Emerald, Elsevier, Scopus, JSTOR, NHI) were searched for relevant publications up to March 2022 examining children's programs as regards food consumption or food references. Our Aim was also to evaluate food presence and any relevant messages, being of negative or positive content, in children's series. In total, 18 articles were assessed as eligible for the study's inclusion criteria. Studies included were released from year 1994 up today and the reviewed media content referred to children's and adolescents programming available worldwide either in cable networks, television channels or box office movies. Evidence shows that children comic series contain mainly unhealthy rather than healthy food references which are of low nutritional value, such as salty snacks, fast foods, and sweets. Some of the studies agree that sweets in the movies and tv series are always placed in a positive environment (either the characters consume the sweets or are just placed in the story's narrative). In contrast, food references which present food such as fruits or vegetables are neutral or even negative in nature and considerably fewer in number. Findings of the present study may help to tailor future health interventions by regulating children's programs in terms of unhealthy food exposure.

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- Public Health Toxicol 2022;1(Supplement 1):A114**
DOI: 10.18332/pht/149636
- Rheological and physicochemical properties of doughs and bread enriched with bioactive microconstituents from Corinthian raisins (*Vitis vinifera L., var. Apyrena*)**
- Evgenia Nikolaou¹, Evangelia Karvela¹, Eirini Panagopoulou¹, Antonia Chiou¹, Vaios Karathanos¹
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- Bread constitutes an important source of macro- and micro-constituents as a daily staple in the human diet, being ideal for the incorporation of phytochemical compounds from rich sources^{1,2}. The effect of model bakery products enrichment with grape bioactive compounds on the physicochemical and rheological properties³ of dough and ready to eat product was investigated. Six types of enrichment were used (extract, lyophilized fruit powder, lyophilized extract, and their combinations) obtained from Corinthian raisins^{4,5}. Dough and bread properties were determined using dynamic rheological measurements and texture analysis. Intensity of colour ($L^* a^* b^*$, ΔE) was determined for both sample forms, as well as moisture content, a_w , pH and %swelling. Dough's rheological properties were considerably affected, from different enrichment types. Extract-enriched doughs, exhibited increased G' and hardness values, compared to control samples while lyophilized extract-enrichment resulted in decreased values. Powder-enriched doughs displayed similar rheological behavior and textural attributes with the control sample. Color parameters were significantly different concerning the type of enrichment. pH variations were highly dependent on yeast action which interacted with the ingredients of the samples. No significant correlation existed between ΔE and fruit total phenol content ($p=0.01$). Sensory evaluation of bread presented higher preference for powder-products and not by extract due to ethanol content. The results suggest that grape powder incorporation into a food matrix is a promising way to improve its nutritional value and appearance without impacting its rheological-texture parameters and final product's acceptance.
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Public Health Toxicol 2022;1(Supplement 1):A115
DOI: 10.18332/pht/149670

Mediterranean diet and environment: A reciprocal symbiotic relationship

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Introduction

The planet's health goes through our plates, and this is because our food choices affect our health and the environment. The indicator that can provide us with that information which causes the environmental impact is called ecological footprint, and it consists of the carbon and water footprint from the way by which food is produced, processed, distributed, and consumed, determining the environmental impact that can be caused. Mediterranean diet has been considered a sustainable diet related with low environmental impact and great health benefits.

Methods

A systematic search was conducted, where a variety of articles published in English were scrutinized, including data concerning ecological footprint, Mediterranean diet, and sustainable diet. The databases used were PubMed, Scopus, and Google Scholar.

Results

Meat (mainly red) is the food with the most significant ecological impact, whereas fruits and vegetables have a limited effect. In general, the lower the consumption of food of animal origin, the lower the environmental pollution. Thus, adopting the Mediterranean diet model could reduce global carbon dioxide emissions, contributing to the stabilization of the climate, reducing the loss of wildlife, and decreasing land use for cultivation, while simultaneously provide health and longevity for humans. In a reciprocal way, protecting biodiversity and minimizing environmental pollution could ensure the access of human population to Mediterranean diet natural resources.

Conclusions

Mediterranean diet could be considered an ideal sustainable diet model since foods of plant origin represent the most significant percentage of this diet. However, the rise in human population in the Mediterranean countries will increase the pressure on the gradually limited and scarce Mediterranean natural resources, reinforcing the emergent need for novel public policies and measures to be promoted, in order for the biodiversity of these areas to be ensured.

Public Health Toxicol 2022;1(Supplement 1):A116
DOI: 10.18332/pht/149671

Sustainability and its role in human well-being: A bibliometric analysis

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Introduction

In recent decades, the importance of sustainability to various aspects of human well-being is increasing. Sustainability

or Sustainable Development is an interdisciplinary field of study that focuses on three main axes: the environment, the economy, and society. The scientific literature concerning sustainability is immense and thus applying bibliometric analysis and mapping techniques can be useful to study the development of the topic as well as its relations with food production and human nutrition.

Methods

Bibliometrix and VOSviewer were utilized to perform bibliometric analysis and construct bibliographic maps for the approximate 12000 review articles that were identified in the Scopus database. The goal of our research was to study the scientific interest on sustainability focusing on human well-being, to identify the most frequent keywords, the relations amongst them, and to detect the countries that had the greater impact.

Results

The study showed that the connection between sustainability and environment has attracted the scientific highest interest. More topics are introduced in the field the last decade with increasing research on nutrition and health issues, primarily focusing on global food production and security. Food and nutrition topics are also related to climate change and policies that need to be adopted to eliminate hunger, as well as to sustainable agriculture. Furthermore, Europe, Asia and South America have an influential role in the evolution of the field, which is also supported by the main funding sources.

Conclusions

Sustainability is a significantly developing field, with a greater concern until now about environmental sustainability. Food security is also an important topic with an increasing rate of interest, mainly related to the second sustainable development goal as defined by the United Nations that refers to hunger. Finally, in the last decade, more topics are introduced on sustainability research with focus on human well-being and public health in general.

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Public Health Toxicol 2022;1(Supplement 1):A117
DOI: 10.18332/pht/149672

Sensory evaluation and consumer response of fillets from seabream fed with lipids extracted from olive oil by-products

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In the last decade, the interest of aquaculture industry has turned toward the production of potential functional products that would confer health benefit to the consumer. In recent years, high attention has been given to the production of new fish feed by partly replacing fish oil with vegetable-based industrial by-products, aiming to improve the nutritional value and enhance the functionality of the fish produced. However, it is crucial to examine the consumer response towards these products. Thus, in the present study, consumers of both sexes in a wide range of age and income (n=137), were invited to evaluate and express their opinion towards the willingness to buy fillets from seabream which was fed with a fraction of lipids extracted from olive oil by-products (enriched fish) and compare it with the conventional seabream fillets. Results indicated that there were no significant differences between conventional and enriched fish in texture, taste and flavor parameters. The majority of participants (93%) stated that the sensory quality is an essential factor for fish purchasing. Although the enriched fish recorded lower score in general appearance compared to the conventional, it was highly appreciated by the consumers, since a high score equal to that of the conventional fillet was recorded in overall assessment. The price was also taken into consideration from a noteworthy percentage (35%) of consumers, however many of them expressed willingness to pay a premium price for the enriched fish, in case that this product would confer health benefits. Overall, the present study gives very promising results regarding the entering of this new product to the market, since it was accepted and appreciated by the consumers equally to the conventional one and undoubtedly deserves further scientific attention to ascertain its potential functional profile.

Public Health Toxicol 2022;1(Supplement 1):A118
DOI: 10.18332/pht/149689

Greek translation of the International Dysphagia Diet Standardization Initiative (IDDSI) whole framework and testing methods poster

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Introduction

Standardized terminology can reduce misunderstanding and facilitate interdisciplinary scientific dialogue. The International Dysphagia Diet Standardization Initiative (IDDSI) Framework released in 2015 represents a standardized language for dysphagia involving 8 levels identified by numbers, labels, colors, definitions, and measurement methods¹.

Aim

The aim was to present the IDDSI initiative and raise awareness for the classification of dysphagia diet standardization to the Greek scientific society.

Methods

Descriptors of each food category are accompanied with easy-to-use testing methods that can be applied by dysphagia patients or their caregivers, clinicians, catering professionals or food industry workers, to identify safely to which category any food belongs.

Results

In the poster, all terms are translated in Greek and links provide free access to the IDDSI Testing Methods documents, frequently asked questions page and to free webinar.

Conclusions

This translation fills in the gap in Greek literature regarding objective food texture classification. In clinical settings, IDDSI removes the communication barrier between professionals, nurses and caregivers, helping them to follow precisely the instructions regarding patient feeding initiative.

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Public Health Toxicol 2022;1(Supplement 1):A119
DOI: 10.18332/pht/149690

The evaluation of anti-aging cosmetics

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Introduction

The beauty market includes the provision of services that concern both the face and the body. There are many methods applied, aiming for the good appearance of the skin. Cosmetology constantly researches and produces products targeting anti-aging and smoothing of wrinkles that appear over time. Consumption of anti-aging products is high worldwide. For this reason, we researched customers' satisfaction with the use of these products.

Material and Methods

A total of 242 people took part in the research, of which 228 were women and 14 were men. All these people visited either beauty salons or dermatological clinics. The age of the respondents ranged 35–87 years. All participants were asked if they had used anti-aging cosmetics and they were requested to evaluate their effectiveness according to a Likert scale. The lowest score was 1 and the highest 5. They were also asked what other anti-aging methods they had used.

Results

About 71% of participants replied that the use of anti-aging cosmetic products had not caused any significant results. In contrast, the remaining 29% had noticed an improvement in their skin appearance. Only 18.18% underwent other anti-aging treatments. These treatments were mesotherapy (50%), botox (25%), injectable hyaluronic acid (4.54%), followed by radiofrequency treatments, lasers and chemical peels.

Conclusions

Although 71% of the respondents did not mention a good effect by the use of anti-aging cosmetics, however only 18.18% tried other anti-aging methods. This may be because these other methods are more aggressive. There should be more information about the importance of nutrition in the health and good appearance of the skin.

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Public Health Toxicol 2022;1(Supplement 1):A120
DOI: 10.18332/pht/149691

Administration of Mediterranean fruit leads to detection of polar phenols in rat brain tissue

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Mediterranean dried fruits are abundant in bioactive microconstituents, such as polar phenolics, which are credited for multiple beneficial health effects¹. Despite their low bioavailability, several studies have found a link between polar phenol ingestion and the ability to prevent neurodegeneration, decrease neuroinflammation, and improve cognitive performance^{2,3}. To better understand the mechanisms of action of polar phenolics, quantitative and qualitative data on their accumulation in the brain is critical. Hence, a simple, quick, and selective UPLC-Orbitrap MS method was implemented within the scope of the present study, aiming to investigate a wide range of polar phenols' brain accumulation. This approach was successfully implemented to assess the deposition of polar phenols in brain tissue of rats that consumed a Mediterranean dried fruit. Our results indicate that polar phenolics present in the dried fruit, are in fact able to cross the blood-brain barrier (BBB) and accumulate in the brains of rats. Given that the brain distribution of polar phenolics is widely debated, our findings could be considered a stepping stone for further research to be conducted into the bioavailability and tissue specific distribution of bioactive phytochemicals associated with Mediterranean foods, such as dried fruits. The overall goal is to underline the merit of Mediterranean dried fruits of high nutritional value, for the promotion of a healthy brain, and ultimately the tissue-specific protection provided by foods rich in bioactive microconstituents.

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Public Health Toxicol 2022;1(Supplement 1):A121
DOI: 10.18332/pht/149695

Characterization of the microbial composition in Greek sourdoughs through amplicon sequencing

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Sourdough fermentation is carried out by the microbial communities developed in the sourdough. Microbial species and microbial relative abundance play a major role in modulating the final product's characteristics, and ultimately its nutritional value. In this context, we studied the microbial communities of 13 Sourdoughs collected from different geographical locations in Greece. Characterization of bacterial communities was performed through sequencing of the 16S rRNA gene. Yeast community composition was characterized through sequencing of the ITS spacer. Bacterial communities were shown to be dominated by representatives of *Lactobacillus* genus in all samples. In particular, *L. brevis*, *L. pontis* and *L. paralimentarius* dominated the bacterial communities at the Species level. Yeast communities consisted almost exclusively of *Saccharomyces cerevisiae* (over 97.7% of relative abundance in all samples). Alpha-diversity analysis revealed that within each sample, bacterial communities were more diverse than yeast communities. Study of the microbial communities in sourdough can help us identify the organisms that confer the desirable characteristics to the final product, thus giving us the opportunity to exploit these organisms, in order to create novel products with improved quality and nutritional value, better organoleptic characteristics (e.g. texture, palatability) and longer shelf life.

Public Health Toxicol 2022;1(Supplement 1):A122
DOI: 10.18332/pht/149685

Characterization of the microbial activity and functions in Greek sourdoughs through the use of metatranscriptomics

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During fermentation, characteristics of sourdough-derived products are defined, not only from the fermentation substrate but also from the activity of the existing microbial community. Study of these functions can contribute to the identification of the specific metabolic processes that influence the products' features, such as texture, taste or shelf life, in addition to the organisms performing them. On this basis, we evaluated, through metatranscriptome sequencing, the microbial gene expression activity levels and the processes taking place in

8 sourdough samples, collected from different locations in Greece. Results showed that the most active bacterial genera belonged to family Lactobacillaceae, while the most active yeast genera belonged to family Saccharomycetaceae. The majority of the most abundant identified KEGG functional orthologs (KEGGs) and Protein Families (Pfam) were involved in carbohydrate metabolism, while the remaining KEGGs and Pfam hits were related to fundamental cellular processes. Clusters of Orthologous Genes (COG) annotation revealed that the most abundant COG category was 'G:Carbohydrate metabolism and transport' followed by category 'J:Translation' and other processes related to fundamental cellular activities. Understanding all processes involved in sourdough fermentation enables us to control their activities and/or perform targeted interventions, in order to create new and improved sourdough products in terms of organoleptic characteristics, nutritional value, product quality, and shelf life.

Public Health Toxicol 2022;1(Supplement 1):A123
DOI: 10.18332/pht/149688

Correlation between peptide hormones and weight and glucose homeostasis among obese and normal weight eastern Mediterranean individuals

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Adipose tissue and gut peptide hormones in coordination with the hypothalamus regulate energy balance and glucose homeostasis¹. Several hormones, including pancreatic polypeptide (PYY), glucagon-like peptide 1 (GLP-1), cholecystokinin (CCK), insulin, and leptin, function as satiety signals^{1,2}. In contrast, ghrelin promotes hunger³. The aim of this study was to examine the role of these peptide hormones on weight by looking at obesity markers [body mass index (BMI), waist circumference (WC), waist-to-height ratio (WtHR), percent body fat (%BF)], blood glucose, and the Homeostatic Model Assessment of Insulin Resistance (HOMA-IR). Thirty obese (OB) adults and 23 normal weight (NW) age- and gender-matched counterparts were recruited in this cross-sectional analysis. OB participants showed significantly higher levels of leptin (62.54 ± 28.76 ng/mL vs 13.92 ± 8.67 ng/mL; $p < 0.001$), PYY (82.44 ± 51.81 pg/mL vs 57.60 ± 31.66 pg/mL; $p = 0.036$), GLP-1 (32.74 ± 15.73 pM vs 24.45 ± 9.64 pM; $p = 0.022$), insulin (20.91 ± 10.32 μ U/mL vs 8.01 ± 2.47 μ U/mL; $p < 0.001$) and HOMA-IR (5.43 ± 2.63 vs 1.95 ± 0.70 ; $p < 0.001$). NW participants had significantly higher levels of ghrelin (431.7 ± 202.3 pg/mL vs 231.7 ± 130.1 pg/mL; $p < 0.001$); no difference was seen in CCK. GLP-1 was positively correlated with all obesity markers (except for %BF) and glucose homeostasis indicators (except for glucose). Leptin was positively correlated with all markers (except for glucose). PYY was only positively correlated with obesity markers. As for ghrelin, it was inversely correlated with all of the markers except for glucose. In the regression analysis model, leptin was associated with obesity and impaired glucose homeostasis. However, a better understanding of the pathways of body weight and food intake regulating gut

and adipose tissue derived hormones will help to find new strategies to treat obesity and its consequences, since the effect of some hormones remains controversial.

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Public Health Toxicol 2022;1(Supplement 1):A124
DOI: 10.18332/pht/149726

Changes in nutrition of children/adolescents and their parents during the first COVID-19 lockdown in Greece: The COV-EAT study

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The aim of this study was to investigate changes in the eating behavior of children and adolescents during the first lockdown implemented in Greece due to COVID-19 and to explore possible correlations with corresponding changes in the eating behavior of their parents. A quantitative cross-sectional study was performed using an online questionnaire. The research sample consisted of 397 parents with children aged 2–18 years, who were recruited from 63 municipalities in Greece. It was observed that during the lockdown period, children/adolescents and parents reduced their fast-food consumption (the percent of parents reporting that they 'never' consume fast-food increased by 45.1% and of children/adolescents by 34%). Furthermore, 85.1% of the parents reported increase in their snack consumption and 60% in their sweets' consumption. An increase in consumption of sweets by children/adolescents was also observed (2.3% daily, 8.8% weekly). In addition, children/adolescents and parents increased their breakfast consumption by 5.1% and 10.6%, respectively. The increase observed in parental breakfast consumption was associated with increase in their children's/adolescents' breakfast consumption (46.9%), while the decrease in parental breakfast consumption was associated with decrease in their children's/adolescents' breakfast consumption (60%) ($p = 0.01$).

In conclusion, negative changes were found in the eating behavior of children/adolescents and their parents during the first COVID-19 lockdown in Greece. Considering that lockdowns may be applied again to tackle the COVID-19 pandemic, the findings of the present study indicate that the promotion of healthy nutrition should be included in the agenda of public health measures to be taken.

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Public Health Toxicol 2022;1(Supplement 1):A125

DOI: 10.18332/pht/149731

Drivers of seafood consumption: Awareness and attitudes of dieticians towards seafood

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Introduction

The seafood consumption is a large topic with many contradictory and confusing issues on processing technology and seafood safety and quality. Dieticians instruct consumers and lead their food preferences. Thus, their knowledge is of crucial importance to achieve a better-informed consumer.

Aim

The aim of this study was to assess the knowledge and attitude of dieticians towards common processing/preservation technologies and seafood products consumption and also to compare with responses of other professionals.

Methods

Participants (140 dieticians, 176 other professionals) completed an on-line form of an electronic questionnaire. Data analysis (Pearson's chi-squared test, Z-test) was performed using SPSS.

Results

Most dieticians were against or not recommending the consumption of food additives and monosodium glutamate (MSG) added seafood (63.6% of dieticians), irradiated (50%), canned (43.6%), salted (40.7%) and modified atmosphere packaged seafood (24.3%) and suggested the limited consumption of mussels (50%) and frozen seafood (39.3%). However, the dieticians recommended the consumption of seafood rich in ω 3 fatty acids (95%), lean (90%) and fatty fish (84.3%), sushi (70%), aquaculture fish (62%), marinated (57.1%), and smoked seafood (43.6%), fish oils (35.7%), surimi (34.3%), Spirulina sp. (33.5%) and dried sea food (29.3%). Most dieticians declared no awareness of chitosan (43.6%) or they were not sure of its role (30.7%). Also, the dieticians had a significantly more positive attitude towards processing technology and seafood consumption issues compared to other professionals, especially for fish oils consumption, frozen sea food, mussels, Spirulina and sous-vide packaged seafood consumption.

Conclusions

This study highlights the importance of educational interventions to improve dieticians' knowledge on processing operations, preservation technologies and consumption of common seafood products.

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Public Health Toxicol 2022;1(Supplement 1):A126

DOI: 10.18332/pht/149696

Study of the relationship among the consumption of bio-functional foods ingredients with bone metabolism indices in middle-aged and elderly people with osteoporosis risk

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Introduction

The purpose of this study was to evaluate the prospective effect of the consumption of biofunctional foods and ingredients as well as the creation of an innovative food on bone metabolism in the middle-aged and elderly.

Methods

In a prospective randomized control trial study, 100 postmenopausal volunteers aged 45–75 years were divided into four groups with an increased risk of osteoporosis. The first intervention group received vitamin C, D3, Ca and Mg. The second group received vitamin D3, Ca and Mg. The third group received bisphosphonates, vitamin D3, Ca and Mg. The food group received an innovative functional food and vitamin D3, Ca, Mg. The study with the three groups lasted 12 months. The food study lasted 5 months. Anthropometric indices and bone density were evaluated at the beginning and at the end of the study. The statistical processing was performed with the program IBM-SPSS Statistics2018 with significance level was $p < 0.05$.

Results

According to bone density criteria, 53.16% showed low bone density and 45.57% showed normal bone density. For the intervention groups with biomarkers, the results showed that for $t=0$ and $t=1$, the vitamins D, vitamin C, Ca, Mg, parathormone (PTH) were in normal limits. In the study from the consumption of innovative food, olive paste with mountain tea, it was found that the values in the biomarkers, BMI, osteoporosis categories at both $t = 0$ and $t = 5$, fluctuated at normal levels.

Conclusions

Study significantly helped volunteers improve bone density levels by delivering innovative food. The novelty of the study was that for the first time an olive paste with mountain tea was given to volunteers.

Public Health Toxicol 2022;1(Supplement 1):A127

DOI: 10.18332/pht/149697

Diet type and attitudes of Greek consumers towards dietary supplements

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Introduction

Many studies have highlighted variations in prevalence of dietary supplements (DS) use and its determinants across countries. However, survey data for DS use and its determinants amongst general population of Greece remain limited.

Aim

The aim of this study was to investigate DS use among Greek people following different types of diets (free, low in fat, low in carbohydrates, low in calories, vegetarian).

Methods

The sample size was 30901. Participants were interviewed face-to-face using a standard questionnaire. Data analysis (Pearson's chi-squared test, Z-test, correlation analysis) was performed using SPSS.

Results

The overall prevalence of DS use was 54.1%, and it was higher in low in fat diet followers (64.2%) and lower in 'free' diet followers (51.1%). Participants reported that the replenishing of inadequate nutrients (36.2%) and the treating and prevention of diseases (37.2% and 26.3%) are reasons of DS use, without significant differences among diets. Participants reported that the fear of side-effects (35.1%), the adherence to a good diet (32.1%) and the good physical condition (32.8%) are the main reasons of DS non-use. Most participants adhered strongly to the doctors' (59.6%) and pharmacists' (24.1%) recommendations, but followers of low in carbohydrates diet adhered mainly to the coaches' recommendations. Low in carbohydrates diet followers strongly believed that medical tests should precede any decision for DS intake (55.6%). However, vegetarian diet followers believe the opposite (58.4%). Respondents, especially those following vegetarian diet were convinced of their ability to evaluate DS importance for health (46.4%) and also any health risk from excessive DS intake (57.0%), but they were incapable to adequately evaluate DS ingredients' authorization (mainly the free diet followers). The great majority of participants (especially the low in fat diet followers) considered seriously the recommended daily allowance.

Conclusions

Data obtained on the use of DS among people following different diets could be very useful to formulate interventions aiming to maximize benefits from their use.

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Public Health Toxicol 2022;1(Supplement 1):A128

DOI: 10.18332/pht/149706

The Mediterranean diet as a feeding protocol for hospitalized patients with COVID-19

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Introduction

Most of the patients treated with COVID-19 belong to vulnerable groups, resulting in many cases of malnutrition and dysphagia due to persistent cough. It can also cause nausea, vomiting, and diarrhea, which may increase the risk of dehydration and muscle catabolism. Therefore, patients with COVID-19 are at high risk of malnutrition, making the need for nutritional management one of the basic needs for their care. It seems, therefore, that good nutritional status is an advantage for those who suffer from this disease.

Methods

Studying and analyzing a variety of articles published in English, a systematic literature review was performed, using the PubMed and Scopus databases.

Results

Dietary protocols for patients suffering from COVID-19 infection should be straightforward because the urgent and massive arrivals of patients in need of emergent respiratory care often make nutritional evaluation and care of lower priority. The Mediterranean diet has been rendered as one of the healthiest nutritional standards in the world, due to the inclusion of a great variety of nutrients mainly of plant origin – namely fruits, vegetables, legumes, fish, and olive oil – which in addition to essential vitamins and antioxidants, bioactive polyphenols, especially flavonoids, provides a shield against the highly inflammatory and pro-thrombotic environment caused by COVID-19.

Conclusions

Due to the elevated need for vitamins and antioxidants of seriously ill patients, in order to strengthen their immune system, the hypothesis of the protective effect of the Mediterranean diet against COVID-19 should be considered in parallel with the currently available epidemiological data. However, there are not yet enough studies in seriously ill patients fed in hospitals, and so only hypotheses about the beneficial properties of the micronutrients provided by this diet model can be currently made.

Public Health Toxicol 2022;1(Supplement 1):A129

DOI: 10.18332/pht/149735

Investigating the changes in the dietary habits and the quality of life among patients with Inflammatory Bowel Disease during the COVID-19 pandemic

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Background

Diet is an important factor of the pathogenesis and the management of Inflammatory Bowel Disease (IBD). We

aimed to investigate the dietary changes during the COVID-19 pandemic and their impact on the quality of life among patients with IBD.

Methods

We conducted a cross-sectional online study using self-report questionnaires. The questionnaire included sociodemographic characteristics, eating habits (MEDAS scale, daily consumption of certain foods), quality of life (SIBDQ scale), lifestyle habits (smoking, physical activity, appetite, body weight perception), and COVID-19 infection status. The research took place from June until October 2021 and involved adults diagnosed with IBD who had Internet access. The data analysis was performed with the IBM SPSS 21.0.

Results

A total of 92 patients participated in this study, 71 (77.2%) females and 21 (22.8%) males; 33 of the participants (35.9%) mentioned that their diet and lifestyle had deteriorated, while 16 (17.4%) mentioned that they had improved. The patients' adherence to the Mediterranean diet was moderate. Most patients reported an average quality of life. Patients with Crohn's disease had better adherence to the Mediterranean diet and a better quality of life in comparison to patients with ulcerative colitis, but no relation was found between the two variables. Regarding the feeling of hunger, 43 (47.7%) reported an increase, whereas 10 (10.9%) reported a decreased appetite during the pandemic. Additionally, 36 (39.1%) patients thought that they did not gain so much weight, and 23 (25%) that they gained a lot of weight. Smoking and exercise did not present significant differences compared to the pre-pandemic period. Only 2 (2.2%) of the patients were infected by COVID-19 and no one needed to be hospitalized.

Conclusions

Patients with IBD changed their dietary habits during the COVID-19 pandemic, but these changes did not affect their quality of life.

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Public Health Toxicol 2022;1(Supplement 1):A130

DOI: 10.18332/pht/149736

Bone mineral density of amateur soccer players and the influence of their blood tests

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Introduction

Football is a complicated sport that requires endurance and intensity, and has an increased osteogenic effect, mainly in the lower limbs. However, bone formation requires an adequate and continuous supply of nutrients (calcium, magnesium, etc.).

Aim

This study aimed to investigate the effect of biochemical health indicators and anthropometric characteristics on the BMD of amateur football players of a football team from Thessaloniki, Greece.

Methods

The sample consisted of 20 male amateur soccer players aged 19–35 years (mean age 24.80 ± 4.56 years). The bone mineral density was measured by the dual-energy X-ray absorption (DEXA) method. Hematological and biochemical markers were done using standard laboratory methods.

Results

The measurements of BMD in the lumbar spine (L1-L4) (\bar{x} =1.27), BMD in left and right dual femur (\bar{x} =1.28) and BMD in left and right forearm (\bar{x} =0.75), were examined. Positive correlations were observed between BMD and age, Body Mass Index (BMI), Basal Metabolic Rate (BMR), Body Fat Mass Index (BFMI), Fat-Free Mass Index (FFMI) and blood potassium levels. Also, BMD in right dual femur was negatively correlated with blood sugar levels. Specifically, based on two multiple linear regression models, if blood sugar levels are increased by 1 unit, the BMD of the right dual femur would decrease by 0.007 units, while if blood potassium levels are increased by 1 unit, this BMD will increase by 0.372 units. Also, if BMR and blood threonine levels are increased by 1 unit, BMD in the lumbar spine would increase by 0.001 and 0.339 units, respectively, while if plasma tyrosine concentrations increased by 1 unit, the BMD will decrease by 0.448 units.

Conclusions

BMD is affected by several anthropometric measurements and biochemical health indicators, making it a useful predictor of a footballer's health.

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Public Health Toxicol 2022;1(Supplement 1):A131
DOI: 10.18332/pht/149740

Investigation of the functional capacity of lyophilisate of Black Sea mussels in fructose-induced obesity

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Background

In recent years, it has been found that different classes of free fatty acids (FFAs) can control gene expression in lipid metabolism and thus metabolic health. Irrational diet, especially high fructose intake leads to oxidative stress, high levels of saturated FFAs, changes in the phospholipid composition of mitochondrial membranes and dysfunction, activation of proinflammatory cytokines, leading to damage, including cell death. The aim of our study was to investigate the effect of Black Sea mussels lyophilisate, rich in polyunsaturated fatty acids (PUFA), on lipid metabolism in fructose-induced obesity.

Methods

Twenty-four male rats were randomly assigned to three groups of eight animals each: HFD (20 % fructose in drinking water for 16 week) group, HFD + Black Sea mussels lyophilisate (ML) group, and control group. Analysis of fatty acids was performed by Gas Chromatography-Mass spectrometry. The main markers of metabolic abnormalities (BMI, glucose, total cholesterol, triglycerides), the markers of oxidative stress (hepatic SOD 1, NOS 3), and plasma TNF α inflammatory marker, were measured.

Results

The results showed microvesicular steatosis, significantly elevated ratio of very long-chain saturated to unsaturated fatty acids- C20:0-C24:0 levels, BMI, glucose, total cholesterol, triglycerides liver SOD 1 and TNF α in HFD, compared to the control group. In the group treated with ML rats, the application of lyophilisate restored the observed changes in the studied parameters close to those of the control.

Conclusions

HFD induces obesity and alters lipogenesis, which is probably associated with increased accumulation of many long-chain saturated fatty acids (VLCFAs), which cause oxidative and proinflammatory damage. Lyophilisates from Black Sea mussels protect against them, which makes them an interesting source for the prevention of socially significant obesity and cardiometabolic diseases.

Public Health Toxicol 2022;1(Supplement 1):A132
DOI: 10.18332/pht/149745

Nutritional status of athletes in northern Greece

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Aim

Studies regarding nutritional status of athletes have been increased the last decades. Nutrition assessment is a necessary first step in advising athletes on dietary strategies for improving their performance. The aim of this study was to evaluate body composition and nutritional status in a sample of athletes in Northern Greece.

Methods

Sixty-three athletes (45 men and 18 women), participating in basketball, volleyball, football, polo, track competitions, and sprints, aged 18–49 years, from Northern Greece, were included in the study. The subjects were submitted to anthropometric measurements and body composition was assessed with bioelectrical impedance analysis (BIA). Nutritional intake and adherence to the Mediterranean diet was assessed using the Mediterranean Diet Score questionnaire. Participants completed a validated questionnaire about their demographic and socioeconomic data, dietary preferences and ergogenic aids' use, among others.

Results

Participants were 22.00 \pm 7.22 years old, the mean weight was 79.2 \pm 16.8 kg, mean BMI 23.5 \pm 3.4 kg/m² and mean fat percentage 13.6 \pm 7.2%. The total Mediterranean Diet Score was 30.0 \pm 5.87 for all athletes who participated, with no statistically significant difference depending on their sport (p=0.599). Also, no statistically significant difference was found when analysis was carried out based on gender (p=0.150), education level (p=0.956), and marital status (p=0.598). The majority of athletes (71.4%) did not take any dietary supplement to help them in their athletic performance, while those who used them preferred vitamins, amino acids and sports drinks (65%, 33.3% and 15%, respectively) following the recommendations of their dietitian.

Conclusions

Athletes, regardless of their sport, choose a balanced Mediterranean diet to improve their athletic endurance and performance and abstain from any ergogenic aids.

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Public Health Toxicol 2022;1(Supplement 1):A133
DOI: 10.18332/pht/149748

Aortic wall changes in fructose-induced obesity rat model

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Background

Over the past 40 years, one of the most widely used industrial sweeteners in processed foods and beverages is fructose. Consumption of a high-fructose diet (HFD) is tightly associated with an increasing frequency of multiple disorders including visceral obesity and cardiovascular diseases (CVDs). The latter are considered the leading cause of death globally. Since the consequences HFD consumption in animals have similar

effects to those seen in humans, animal models of obesity are widely used for research purposes. The aim of this study was to investigate the pathogenic link between abdominal wall changes and fructose-induced obesity in rats.

Methods

We used a rat model of HFD (HFD-12 weeks, 20 % glucose-fructose corn syrup). Male Wistar rats were assigned to two experimental groups (n=8): control and HFD group. Over the whole experimental period, all animals were provided with a standard rodent diet and tap water ad libitum. Zoometric measurements, body mass index (BMI) and morphometric parameters of the abdominal aorta were analyzed. Routine histological and immunohistochemical staining techniques (SOD-1, NOS3 - oxidative stress and endothelial dysfunction markers- FLT-1) were applied to evaluate the pathomorphological changes in aortic wall using Aperio Image Scope software. The functional properties of the abdominal aorta were assessed through the Kernogan's index (KI) calculation.

Results

Our results demonstrate higher values of BMI, aortic wall thickness and Kernogan's index in HFD group compared to the controls. Furthermore, immunohistochemical endothelial expression of SOD-1 in the HFD group was increased whereas NOS3 and FLT-1 were reduced.

Conclusions

HFD causes visceral obesity, increased BMI, oxidative stress and pathomorphological and dysfunctional changes in the aortic wall that may be associated with the development of endothelial dysfunction and CVDs.

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Public Health Toxicol 2022;1(Supplement 1):A134

DOI: 10.18332/pht/149758

A dietary pattern rich in legumes, fruits and whole grains in the previous three months is associated with reduced length of hospital stay in women

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Introduction

Data regarding the effect of pre-admission dietary patterns on length of hospital stay (LOS) are sparse.

Aim

The aim was to explore potential associations between recent dietary habits (last three months) of inpatients and LOS.

Methods

Data from 151 hospitalized adult patients (72 women, 121 patients admitted due to cardiovascular disease or stroke) participating in the Nutrition Day project were included (years 2013, 2014 and 2016). An 11-item food frequency questionnaire was used to assess dietary habits and then principal component analysis (PCA) was used to derive dietary patterns. The Nutrition Risk Screening 2002 (NRS-2002) was used for the identification of patients at nutritional risk. Multiple linear regression was performed to examine the associations between LOS, dietary patterns, and other covariates.

Results

Three of the dietary patterns derived by PCA explaining the 55.7% of the total variance were: 1) high consumption of vegetables, animal protein and potatoes, 2) high consumption of alcohol and low consumption of olive oil, and 3) high consumption of legumes, fruits and whole grains. In women, the third pattern was inversely correlated with LOS (B= -1.74, p=0.024) after adjustment for age, risk for malnutrition and underlying diseases. In the same model, age was positively associated with LOS (B= 2.13, p=0.037) (R²=24.7).

Conclusions

Adherence to a dietary pattern characterized by high consumption of legumes, fruits and whole grains, for the previous three months before admission, was related to lower LOS, only in women, regardless of nutritional status.

Public Health Toxicol 2022;1(Supplement 1):A135

DOI: 10.18332/pht/149766

Assessment of nutritional status using objective and subjective methods in Greek cancer patients

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Introduction

Nutritional status is associated with the progression of malignant neoplasms. The present study aimed to assess the nutritional status of cancer patients using a combination of objective and subjective assessment methods.

Methods

Sociodemographic data and blood samples were collected from 152 cancer patients from Attikon University Hospital. The time frame was April - October 2019. Validated questionnaires were used to assess their nutritional status (PG-SGA, NRS-2002, SNAQ). In addition, geriatric nutritional risk index (GNRI) was calculated, handgrip strength test was carried out and arm circumference and skin fold thickness were measured.

Results

The study sample consisted of 50.7% women, the median age was 61.0 years (IQR: 14) and median body mass index (BMI) was 24.4 kg/m² (IQR: 5.95). Based on the PG-SGA assessment, 54.9% of our sample was severely malnourished while 19.7% had moderate or suspected malnutrition. Imminent danger observed in the 83.6% (NRS-2002) and 48.7% of participants was that they were at increased risk of a 5% reduction in body weight within the next 6 months (SNAQ). Compared to other

cancer types, patients with GI track and colorectal cancer had higher values of PG-SGA scores. The median for albumin levels was within normal limits, 4.10 g/dL (IQR: 0.6). According to GNRI, high risk for malnutrition was indicated for geriatric patients, GNRI of 46.45 (IQR: 5.17). Malnourishment, based on PG-SGA, was positively associated with %weight loss within the past six months and negatively associated with BMI, hemoglobin, handgrip strength and arm circumference (all $p < 0.05$).

Conclusions

The present study showed that a significant proportion of cancer patients were malnourished. Furthermore, poor nutritional status was positively associated with weight loss and negatively associated with BMI, hemoglobin, handgrip strength and arm circumference.

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Public Health Toxicol 2022;1(Supplement 1):A136

DOI: 10.18332/pht/149770

Food insecurity, nutritional behavior and chronic disease morbidity in the Cypriot population

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Food insecurity is a global trend and due to the impact on a person's quality of life, it has been characterized as a public health priority¹. Many researchers concluded that food insecurity increases the prevalence of several chronic diseases²⁻⁴. In light of the above and having in mind that in Cyprus, 28.6% of population is suffering from at least two chronic diseases⁵, the examination of the relationship between food insecurity and chronic disease in the Cypriot population is essential. It is worth mentioning that this is the first attempt to document the severity of the food insecurity within the Cypriot population since there are no data regarding the food insecurity in Cyprus.

The study aims to investigate the food insecurity and chronic diseases morbidity in the Cypriot population. In addition, we will examine the possible association between participant's nutritional behavior, sociodemographic factors, and presence of chronic diseases.

The present cross-sectional study will include at least 1145 persons aged >18 years, residing in the Cyprus government-controlled area. Participants will be asked to complete certain questionnaires which will be provided during face-to-face meetings with trained researchers. Samples will be collected by using a stratified sampling procedure based on participant's region, age, and gender. The participants will be asked to answer questionnaires in relation to their medical history, food insecurity, sociodemographic variables, meal frequency consumption, late night overeating, nutritional habits and physical activity.

Based on the collected results, we will be able to design effective intervention programs to limit food insecurity in Cyprus on the one hand, and at the same time to reduce the

prevalence of chronic diseases.

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Public Health Toxicol 2022;1(Supplement 1):A137

DOI: 10.18332/pht/149773

The use of phytochemicals in the design and production of functional foods and nutraceuticals

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Introduction

Bad eating habits are often linked to pathological conditions such as diabetes, cancer, and cardiovascular disorders. Frequent consumption of plant origin foods has been considered as beneficial in preventing these diseases due to their bioactive compounds such as phytochemicals like polyphenols and carotenoids. Phytochemicals have a strong antimicrobial, antioxidant, anti-inflammatory, and epigenetic action. For this purpose, nowadays, both nutraceuticals and functional foods based on phytochemicals are very popular.

Methods

A systematic search of the available literature in the PubMed, EMBASE, Scopus and Google Scholar databases was performed. The following search terms were applied: phytochemicals, bioactive compounds, functional foods, nutraceuticals, and food matrix. All articles published in English were evaluated.

Results

The effectiveness of plant bioactive compounds included to nutraceuticals and functional foods has been evaluated through their bioavailability and bioaccessibility. As many plant ingredients, phytochemicals have a low solubility, poor permeability, and short shelf life while any chemical structural change of the original bioactive compound during storage or digestion can modify their effectiveness. In recent years, new food production and processing techniques have been used in order to preserve and stabilize the bioactive compounds and improve their absorption. Furthermore, food matrices based on nanotechnology can increase biological efficiency and food safety preserving plant bioactive compounds. However, toxicity of phytochemicals has been reported because of the complex nature of plant products, mainly through possible

interactions with other ingredients.

Conclusions

Both phytochemicals and nanotechnology-based food matrices usage is becoming a growing trend in food and drug industries as a potential source of bioactive compounds, improving consumer health and well-being through prevention rather than treatment. However, further research must be done so that the legal framework for their safety and suitability is defined, the required doses are established and their bioavailability is improved.

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Public Health Toxicol 2022;1(Supplement 1):A138

DOI: 10.18332/pht/149778

Self-reported life style factors and their relation with BMI in Turkish college students

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Introduction

Young adulthood is a transformation period that is known to be associated with weight gain, such as becoming college students. Environmental factors may influence the lifestyle of young adults in the direction of fast eating, irregular meals intake, and sedentary behavior (SB). Dietary behaviors play a critical role in obesity risk and prevention, and there is a growing interest in eating speed (ES). Therefore, the study aimed to investigate the relationship between selected lifestyle factors (ES, irregular meals intake, and SB) and BMI in Turkish college students.

Methodology

A cross-sectional online survey which included 418 participants (345 women, 73 men), was conducted on Turkish college students with mean age of 21.6 ± 2.6 years (range: 18-35) and mean BMI of 22.19 ± 4.17 kg/m². BMI was calculated by self-reported weight and height. Eating speed was determined by asking for a subjective comparison of the participants to people in their surroundings. The Sedentary Behavior Questionnaire (SBQ) was used to determine SB and regularity of meal-pattern, collected using a self-reported

questionnaire.

Results

The results revealed that 23.5% of the participants eat faster compared to people in their surroundings. However, there was no significant relationship observed between ES and BMI. Only 20% of the participants reported having a regular meal-pattern, while 51% reported consuming regular meals sometimes. The SBQ indicated that the total length of SB was 50.6 ± 39.8 hours/week. A significant correlation between SB with BMI was observed.

Conclusions

Young adulthood transformation has affected students' daily lives, including meal patterns and sedentary behavior. Findings suggest that young adults may need dietary support during the transition time and encouraged to have a physically active lifestyle.

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Public Health Toxicol 2022;1(Supplement 1):A139

DOI: 10.18332/pht/149784

Investigation of the adherence to Mediterranean diet in patients with bronchial asthma

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Aim

The aim of the study was to investigate the of adherence to the Mediterranean diet in patients with bronchial asthma who are monitored at the Outpatient Clinic of Bronchial Asthma of the University Hospital of Larissa, as well as the correlation of adherence with the severity of the disease.

Material

The sample was collected from October 2021 to February 2022. Anthropometric and clinical data on the severity of the disease were gathered. The MedDiet Score questionnaire was used to assess adherence to the Mediterranean diet.

Results

The sample consisted of 43 patients diagnosed with bronchial asthma, 74% (32/43) were women. The mean age was 61.7 ± 13.1 years; 55.8% (n=24) of the patients had severe asthma and the rest had moderate asthma. Men at a significantly higher rate had more severe asthma compared to women (82% vs 47%, $p=0.046$). The mean BMI was 31.1 ± 6.6 kg/m², with no difference between genders ($p=0.9$). The percentage of normal, overweight, and 1st, 2nd and morbid obesity, were 9%, 51%, 26%, 7% and 7%, respectively. Of the sample, 55.8%

were non-smokers, 39.5% former and 4.7% current smokers; 46.5%, 41.2% and 11.6% of the sample showed great, moderate and low satisfaction with their financial situation, respectively. Also, 48.8%, 46.5% and 4.7% of the sample reported low, moderate and high physical activity, respectively, and 95.3% of patients had moderate adherence to the Mediterranean diet and only 4.7% of patients had high adherence. Greater satisfaction with the economic situation was significantly associated with greater adherence to the Mediterranean diet ($p=0.002$). Adherence to the Mediterranean diet was not correlated with the severity of the disease ($p=0.896$).

Conclusions

It is imperative to implement measures to inform and raise awareness of patients with bronchial asthma about the benefits of the Mediterranean diet.

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Public Health Toxicol 2022;1(Supplement 1):A140

DOI: 10.18332/pht/149785

Nutrition labelling use and adherence to Mediterranean diet and physical activity guidelines

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Aim

The nutritional label (NL) is found in the back or in the front part of the food packaging and it constitutes the source of information in regard to the formulation of the product, the manufacturer, storage methods and food-preparation processes used. Our aim was to examine and analyze the extent of using and comprehending the NL in adult consumers, and explore the association with the adherence to Mediterranean diet and physical activity guidelines.

Methods

Participants were 678 individuals (80.1% women), aged 18–64 years, living in different municipalities in Greece. Participants were asked to answer 34 questions about NL use, anthropometrics, and socioeconomic variables. The Mediterranean Diet Score (MDS) and the IPAQ questionnaires were also used to assess the adherence to the Mediterranean diet and the physical activity recommendations accordingly.

Results

One in three participants could not understand the NL information, while most participants (54.7%) answered that they do not have enough time to read the NL. The majority of people use the NL (67.8%) for health-related reasons and are mainly interested in caloric content, fats, and sugars (51.62%, 45.28% and 37.75%, respectively). The majority of participants who use the NL have an average MDS score

and an average level of physical activity of 65.6% and 54.2%, respectively. When analysis was carried based on body mass index, age, and other socioeconomic variables, no significant associations were found.

Conclusions

It appears that a link exists between the NL and adherence to the Mediterranean diet and physical activity guidelines, with positive outcomes. Further studies exploring the use of the NL as a public health tool to promote sustainable dietary patterns, is required.

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Public Health Toxicol 2022;1(Supplement 1):A141

DOI: 10.18332/pht/149790

The knowledge of people with type 2 diabetes about their disease and the nutritional recommendations required

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Introduction

In Greece, the prevalence of diabetes is 7.4% in the adult population (20–79 years)¹. The need for prevention as well as education of the already sick is of major importance.

Aim

Determining the level of knowledge of people with type 2 diabetes about diabetes and correlating it with their sources of information.

Methods

The research was conducted from January to March 2021, through social networks. Sample consisted of 306 people with diabetes type 2 (self-reported). The general part of the Diabetes Knowledge Test 2 (DKT2) was used to determine the level of diabetes knowledge and the statistical analysis was done using SPSS25.

Results

Sample had moderate general knowledge about their disease (mean score: 10.1/14). Also, they appeared better informed about medical issues and less about nutritional issues (3.9% of the sample answered 7/7 nutritional questions of DKT2 correctly, while 33.3% answered correctly to 7/7 medical questions). In all, 17.3% answered that they had no dietary recommendations from any health specialist, and this was associated with a lower score on DTK2 ($p=0.001$). The source of nutritional information (physician or dietitian) on diabetes management was not found to affect the DKT2 score ($p=0.479$). Finally, it appeared that those who chose a dietitian for their nutritional training had a higher body mass index than those who chose a physician ($p=0.03$).

Conclusions

A significant percentage of diabetics had no dietary recommendations at all and those who received nutritional information from any source appeared to have more medical than nutritional knowledge. Nutritional information for and education of diabetes patients is of major importance, as nutrition is an important part of the management of type 2 diabetes.

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Public Health Toxicol 2022;1(Supplement 1):A142

DOI: 10.18332/pht/149792

Quercetin: A molecule with great biochemical, clinical and nutritional value

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Background

Quercetin, in general, belongs to the broader category of polyphenols. It is found, in particular, among the flavonols, along with kampferol, myricetin and isoramnetin, and it is recognized as a foreign substance by the organism in contrast to vitamins. It occurs mainly linked to sugars with the most common compound being quercetin-3-O-glucoside, or as an aglycone, especially in the plant population. The aim of this review is to present the molecule of quercetin and the recent bibliography in the chemical field, on the mechanisms of absorption and metabolism, the bioavailability, the antioxidant and the clinical effect on diabetes, cancer, and the coronavirus infection.

Methods

Databases such as Scopus, PubMed, Science Direct and Google Scholar were used to collect the sources.

Results

Recent literature reports a positive effect of quercetin on coronavirus patients, as well as it provides a protective effect against oxidative stress, cancer, and helps with the regulation of blood sugar levels. Moreover, research-administered drug dosages of up to 2000 mg/day showed mild to no symptoms of overdose. It should be noted, that quercetin is not considered a carcinogen substance. The daily intake of quercetin through the diet has been measured from 10–500 mg, depending on the type of products consumed.

Conclusions

Due to the lack of recent literature, a specific daily energy need for this substance has not been determined. Therefore, further studies must take place in order for the right administered quantity of quercetin to be considered beneficial to the body.

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Public Health Toxicol 2022;1(Supplement 1):A143

DOI: 10.18332/pht/149794

Nutritional assessment using image annotation: Evaluation of snack eating habits in school-age children in northern Greece

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Aim

The obesity epidemic is widespread not only in adulthood, but also in childhood; in Europe, especially in Italy and Greece, despite being native countries of the Mediterranean diet, the rate of childhood obesity is extremely high. In order to better understand and address this problem, it is essential to collect real-world data on eating habits, a process which can be facilitated by smartphone image collection, annotation and analysis.

Methods

Children aged 9–18 years from 23 public schools in Thessaloniki used the myBigO app in order to capture their dietary intake, by taking pictures of most of their meals for two weeks. For this study, 2744 pictures of snacks were processed and annotated using VGG Image Annotator for determining the food category and whether they meet healthy eating guidelines. The quality of snack consumption (ultra-processed vs natural foods) was also evaluated through the NOVA classification system.

Results

In all, 40.7% of children consumed snacks that met healthy eating guidelines. An additional 18.1% of the snacks were determined as healthy depending on context and, more importantly, quantity. Analysis of the types of snacks, showed that the most consumed snacks were fruit and/or natural fruit juices (37%), followed by consumption of baked products

(27%), sweets (23%), and salty snacks (13%). An alarming amount (50.4%) of snacks were classified as ultra-processed.

Conclusions

These results can contribute to improve national food and nutrition education policies, with the aim of creating effective programs for reducing the prevalence of childhood obesity and overweight. Additionally, the resulting food image dataset with annotated food categories and processing level can be used towards creating new automated image annotation processes.

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Public Health Toxicol 2022;1(Supplement 1):A144

DOI: 10.18332/pht/149795

Rice-bran oil protects from endoplasmic reticulum stress under a high fat diet in rats

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Supplementation of rice-bran oil (RBO) into diet demonstrated a hypolipidemic effect on experimental rats, but the mechanism is still not well understood. We tested the effect RBO on lipid metabolism in rats induced by high-fat diet (HFD) and compare it with orlistat. Sprague-Dawley male rats at seven weeks old were fed on HFD diets (45% fat) for 28 days and divided into a control group (NaCl 0.9%), ORL group (Orlistat 10.8 mg/kg bw/day), and RBO group (RBO contain 57.6 mg oryzanol/day). Supplementations were given through oral gavage. Blank group was given standard diet (10% fat). Body weight and gene expression examination were demonstrated. Data are expressed as the mean \pm SEM. One-way ANOVA were used where applicable. Student's t test was used to analyze the differences between two groups. Compared to the blank group, the three HFD groups exhibited higher body weight; however, there were no differences in cumulative feed intake and final body weight among the four groups. Microarray analysis on liver identified that RBO altered the expression of PPAR α target genes, which include Stearoyl-CoA Desaturase 1 (Scd1) and family acyl-CoA thioesterases (Acot). Both ORL and RBO groups elevate the expression of Scd1 for >2-fold, but reduce Acot5 expression. These findings suggest RBO is as effective as orlistat in preventing hyperlipidaemia and steatosis by reducing hepatic ER stress.

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Public Health Toxicol 2022;1(Supplement 1):A145

DOI: 10.18332/pht/149826

Clinical application of the Food Compass Score: Relation to Mediterranean Diet Score, Health Rating Star System, food groups consumption and meal patterns in students enrolled at the University of the Peloponnese

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Introduction

Nutrient profiling systems (NPS) score food quality using specific criteria. Several individual dietary scores, based on NPS, have been computed. Food compass score (FCS) is a new, credible, transparent NPS, which classifies foods and beverages from least healthy (score 1) to 'most healthy' (score 100) per 100 kcal¹.

Aim

To clinically validate FCS through examining its correlations with other indices, food groups and meal patterns.

Methods

A total of 345 students of the University of the Peloponnese (269 women) participated. Dietary habits were evaluated with a food frequency questionnaire and the following indices were computed: FCS, MedDietScore², and the Health Star Rating score (HSR)³. Data on main meals and snacks frequency consumption were collected and three meal patterns were identified with principal component analysis i.e. 'early eater' (breakfast and morning snack), 'medium eater' (lunch and dinner) and 'late eater' (bedtime snack). Pearson partial correlations were used to test the correlation coefficients between FCS, other scores and meal patterns, after adjustment for age, sex, BMI, and underreporting⁴.

Results

FCS was positively correlated to HSR ($\rho=0.761$, $p<0.001$) in multi-adjusted analysis. In the highest tertile of MedDietScore (scores >33) FCS was also positively correlated to MedDietScore ($\rho=0.379$, $p<0.001$). The FCS was positively correlated with HSR, juices, high fat dairy, vegetables, legumes, fruits, and olive oil. The FCS was negatively correlated with sodas, alcoholic drinks, red meat, refined grains, sweets, fats other than olive oil, fast foods, and coffee. Also, the FCS was positively related to the 'early eater' pattern ($\rho=0.207$, $p<0.001$), while no relation to obesity was documented.

Conclusions

The FCS was associated with other quality indices and better nutritional habits, like being an early eater.

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Public Health Toxicol 2022;1(Supplement 1):A146

DOI: 10.18332/pht/149829

Nutritional biomarkers as prognostic factors of sarcopenia and their role in disease progression

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Introduction

Due to the multifactorial pathogenesis of sarcopenia, it is crucial to identify biomarkers that can be used as prognostic and risk factors for sarcopenia.

Aim

This narrative review aims to define a set of biomarkers associated with nutrition and sarcopenia. These biomarkers could share individualized monitoring and enable preventable and therapeutic methods.

Methods

Two electronic databases PubMed and Google Scholar were used. The search strategy is based on controlled vocabulary (MeSH) and includes studies published up to February 2022.

Results

Vitamin D status acts as a useful biomarker for predicting total mortality, hip fractures, early death, and the development of sarcopenia. Higher levels of serum uric acid are also associated with higher handgrip strength and better muscle function in elders and thus, may slow the progression of sarcopenia. Leptin, an adipokine secreted by adipose tissue, promotes the production of pro-inflammatory cytokines, which in turn lead to sarcopenia. That makes leptin a considerable indirect biomarker for physical disability and sarcopenic obesity. Creatinine is, also, a reliable biomarker for muscle mass status because of its easy accessibility and cost-effectiveness. On the other hand, 3-Methylhistidine, is a valuable biomarker for detecting increased muscle catabolism, as excreted in the urine during muscle degradation. In addition, IGF-1, whose

concentration in plasma is stimulated by food intake, is associated with skeletal muscle mass loss, that probably plays a crucial role in the progression of sarcopenia. Therefore, there is an increasing interest in dietary antioxidants and their effects on age-related loss of muscle mass and function.

Conclusions

Many nutritional biomarkers were found to be associated with sarcopenia, and therefore can be used as prognostic indexes and risk factors. Nutrition has an important role in the prevention and management of sarcopenia, affecting muscle mass, strength, and function in the elderly.

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Public Health Toxicol 2022;1(Supplement 1):A147

DOI: 10.18332/pht/149832

Defining the ideal characteristics of effective interventions for the weight management in breast cancer survivors

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Greater body mass index and adiposity are linked to adverse outcomes in women with breast cancer, including increased risk of recurrence and mortality, poorer quality of life, and increased risk of developing co-morbidities, such as type 2 diabetes, hypertension, and cardiovascular disease. The aim of this systematic review was to identify the ideal elements of effective behavioral lifestyle interventions treating obesity in breast cancer survivors.

A structured search for RCT studies published between database inception and March 2021 was conducted, on the four following databases: PubMed/Medline, Scopus, TripDatabase, and Central/Cochrane. The search strategy included MeSH, Emtree terms and text words, using the PICO framework to

guide the eligibility criteria. The PRISMA guidelines were followed. The risk of bias was assessed. The Behavior Change Technique Taxonomy was used to identify the behavior change techniques (BCTs) in the interventions.

Ten studies met the inclusion criteria. The ideal elements of an effective behavioral lifestyle intervention for weight control in breast cancer survivors were recorded as follows: a duration length at 6 months (n=7), in-person group sessions (n=6), Social Cognitive Theory as the most commonly used theory (n=7) and self-monitoring, goal setting and credible source as the best behavior change techniques (n=10). Lifestyle modification targets should include increased consumption of fruits, vegetables and fiber, decreased in dietary fat, a gradually increased exercise target of at least 30 minutes per day and a weight loss target of 1 lb per week through a 500–1000 kcal energy deficit.

Considering the unique needs of breast cancer survivors, weight management lifestyle interventions should include behaviors modifications in diet, physical activity and psychosocial factors with the use of behavioral therapy and suitable behavioral change techniques according to the characteristics of the most effective interventions (PROSPERO Registration Number CRD42021252827).

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**Public Health Toxicol 2022;1(Supplement 1):A148
DOI: 10.18332/pht/149833**

Investigation of knowledge and attitudes about obesity and gene-nutrition interaction in a sample of the Greek population

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Introduction

The genetic cause of obesity has aroused the interest of researchers, whom the science of Nutritional Genetics and Nutritional Genomics is helping to develop new methods for managing obesity¹. This arises from various genome analysis studies, in which results show that gene polymorphisms are associated with the increased body mass index and obesity².

Aim

To investigate how the dietary behavior and lifestyle of the sample are related to the increase of BMI and possible predisposition to obesity, as well as the knowledge about the interaction of genome and diet in a sample of the Greek population.

Methods

In total, 300 questionnaires from a random sample were completed electronically via network community. The questionnaire consisted of 28 questions, of which the first

part was related to demographic data, the second part was related on eating behavior and lifestyle, and the third part was about the knowledge of the sample on gene–diet interaction. Statistical frequency and χ^2 independence analysis and graphing were performed with Microsoft Excel and SPSS 21 software.

Results

The 71.3% consider diet to be the main cause of obesity, while only 2% consider the genetics. From the analysis of the lifestyle and nutritional behavior of the sample, it emerged that obese people adopt habits that exacerbate weight gain. Also, the majority of participants did not have knowledge about gene–diet interaction but they were interested to know about it. However, they would change their eating habits and receive personalized dietary advice if they knew they had a genetic predisposition to obesity.

Conclusions

It is necessary to inform people about issues related to the predisposition of obesity and the correlation of genes and their interaction with the obese environment in the appearance of obesity. Finally, the provision of personalized knowledge could be a useful tool for providing targeted nutritional recommendations.

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Public Health Toxicol 2022;1(Supplement 1):A149

DOI: 10.18332/pht/149837

Potential beneficial effects of intermittent fasting against cancer risk and management: Novel evidence rendering autophagy as a promising therapeutic target

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Introduction

Intermittent fasting diets are very popular in the last few years, due to their clinical effectiveness on subjects' weight loss¹. They consist of periods of eating alternating with periods of fasting². Intermittent fasting is a generally safe type of diet, because of effects on health-related outcomes and lifestyle adherence providing, while it produces few neurological, hormonal, gastrointestinal and other metabolic adverse effects³.

Methods

Applied summarization of current evidence of the efficacy of intermittent fasting to decrease cancer risk, complications and induced biomarkers, was conducted. In this aspect, many scientific databases, e.g. Google Scholar, PubMed, Google Trends, and Scopus, were comprehensively searched using relevant words to identify the existing in vivo and in vitro evidence, as well as clinical trials.

Results

Intermittent fasting may be beneficial for patients at risk for colorectal cancer because it induces autophagy, a very important process of cellular remodeling and organelle quality control^{4,5}, which improves the in vivo inhibition of autophagy-competent tumors growth by chemotherapy⁶. Intermittent fasting sensitizes tumors to chemotherapy and protects normal cells, including hematopoietic stem and immune cells, from its toxic side effects⁷. In addition, it increases the levels

of bone marrow lymphoid progenitor cells and cytotoxic CD⁸(+) tumor-infiltrating lymphocytes, leading to major delay in breast cancer and melanoma progression⁷. Finally, intermittent fasting reduces chronic, low-grade inflammation, which increases the risk for many cancer types⁸.

Conclusions

Intermittent fasting diet may be a protective factor against cancer risk, inhibiting many types of cancer. There are both well-known and not well-known pathophysiological mechanisms beyond these effects, however, well-designed clinical trials for longer study periods are strongly recommended.

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Public Health Toxicol 2022;1(Supplement 1):A150

DOI: 10.18332/pht/149838

Health-related quality of life and dietary changes in patients with pulmonary embolism during the COVID-19 pandemic

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Background

The coronavirus disease 2019 (COVID-19) pandemic has greatly affected human health, leading to lifestyle changes, through social distancing and isolation at home. As a result of globally implemented lockdown policies, problems concerning the potential detrimental COVID-19-related consequences in patients with chronic diseases emerged¹⁻³. The Aim of the present study is to evaluate dietary and lifestyle changes and health-related Quality of Life (QoL) during the SARS-CoV-2 pandemic.

Methods

Patients with PE that were regularly followed in the Pulmonary Embolism Outpatient Clinic of Respiratory Medicine Department at the University of Thessaly, participated in our study. All participants were asked to complete the Short Form 36 (SF-36) questionnaire⁴ and were asked about dietary and lifestyle changes during the COVID-19 pandemic. Patients were recruited by consecutive sampling.

Results

We included 22 patients with PE (mean age \pm SD = 62.27 \pm 15.03 years, 59.09% males), while 68.18% were non-smokers. During the COVID-19 pandemic, 31.81% (n=7) reduced physical activity by 25%, and 36.36% increased their body weight by 2–3 kg. Of the participants, 9.09% presented a slight increase in alcohol consumption while smoking habits were unaltered. Most of the mean values of the SF-36 subscales were above the normative value except for 'physical role functioning' (46.59 \pm 86.36), 'bodily pain' (46.35 \pm 24.93) and 'vitality' (44.39 \pm 29.28). 'Physical functioning' (49.77 \pm 42.83) and 'general health perceptions' (52.64 \pm 25.37) reached the normative value of 50.

Conclusions

Patients with PE exhibited below average values in some subscales of QoL while their dietary habits were affected by the COVID-19 pandemic.

Funding

This research is co-financed by Greece and the European Union (European Social Fund- ESF) through the Operational Programme «Human Resources Development, Education and Lifelong Learning 2014-2020» in the context of the project "Assessment of long-term effects on the mental health of patients after a pulmonary embolism episode, assessment of empathy and forgiveness" (MIS 5048949).

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Public Health Toxicol 2022;1(Supplement 1):A151

DOI: 10.18332/pht/149840

The impact of social media on dietary choices, emotions around food consumption, and body image in Greek adolescents and young adults

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Introduction

Social media create new opportunities and challenges for public health promotion. Users often come across nutrition and body-related content uploaded by health and non-health professionals. The purpose of this study was to investigate the use of social media by Greek adolescents and young adults, and its impact on their dietary choices, emotions regarding food consumption, and body image.

Methods

An online questionnaire assessing dietary choices and feelings around food was distributed to people aged 13–27 years and was answered by 200 participants of both sexes. The collected data were analyzed using SPSS.

Results

Social media were found to be the preferred nutrition information source for 80% of the participants, while Instagram, YouTube and Facebook were the most used platforms. Dietitians' professional social media accounts were the most trusted source (76%). Overall, users' dietary choices seemed to be moderately affected by social media (38%). In terms of their feelings about food consumption, participants stated that they found posts about healthy eating and new recipes inspiring (66%), and although images of delicious, yet less nutritious food, appeared to create the need for participants to consume such foods, yet 51% mentioned that eventually they did not. A moderate level of emotional pressure from social media was observed in the sample regarding body image, while their stress seemed to be mainly related to obtaining a fitter body (32%) or a 'perfect body' (31%), and to a lesser extent they were interested in losing weight (27%).

Conclusions

Social media can be a useful tool for nutrition professionals aiming to educate young people on a healthy diet. The results also suggest that social media can influence not only their body image, like other types of media before, but also their emotions and eating behavior, with further research needed to confirm and understand this relationship.

Public Health Toxicol 2022;1(Supplement 1):A152

DOI: 10.18332/pht/149841

Assessment of changes in dietary habits during and after the COVID-19 restrictive measures

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Introduction

The COVID-19 pandemic has emerged as an ongoing global public health issue caused by SARS-CoV-2. National restrictive measures were applied globally to reduce community transmission of COVID-19.

Aim

We assessed dietary habits and weight course during and after the implementation of national lockdown measures.

Methods

We performed a quantitative synchronic study that took place from 1 to 30 April 2021 (during quarantine) and from 1 to 30 June 2021 (after quarantine), in Greece. All 300 participants were assessed during the two time periods and were asked to answer: 1) the MedDiet questionnaire, 2) the IPAQ questionnaire, and 3) the quantitative 24-hour nutritional assessment method of recall.

Results

Of the participants, 70.3% were female and only 9% had a history of COVID-19. Most participants were aged 20–40 years (48.3%). We observed that both men and women increased consumption of all food groups after the quarantine measures. During the 2nd assessment period they did not approach the recommended daily portions. The majority of the participants (58%) managed to maintain a stable body weight and BMI. Adequate coverage % of nutrient percentage, specifically for fat, carbohydrates for both sexes was shown. Moreover, the coverage rate in protein intake was better for females (82.6%) whereas the same was not the case for males (64.5%). There was a deficient daily intake of vitamin C (61.7% and 57.3%) and selenium (27.3% and 19.8%), but women (109%) were able to meet their daily zinc requirements completely in contrast to men (86.43%). Selenium, iron, magnesium, phosphorus, calcium and folate consumption did not differ between the two time periods. We did not observe differences in physical activity of the participants.

Conclusions

Based on our findings, the influence of the restrictive measures did not affect the weight while % of nutrient coverage was adequate in most macronutrients and micronutrients.

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Public Health Toxicol 2022;1(Supplement 1):A153

DOI: 10.18332/pht/149842

Investigation of the eating habits, knowledge and perception of children aged 9–12 years on functional food in primary schools of Lemnos and Thessaloniki

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Introduction

Functional foods (FF) can play a central role in supporting children's health in their effort to adopt a healthier diet.

Aim

The investigation of knowledge, perceptions, frequency of consumption of functional foods and the recording of eating behaviors in primary school children.

Methods

A total of 374 children (162 girls and 211 boys) aged 9–12 years (4th, 5th and 6th grade) from 3 schools in Lemnos and 5 schools in Thessaloniki took part in the study. The children completed the KIDMED Questionnaire, as well as a questionnaire about their physical activity, time spent watching TV and playing electronic games, the frequency of cooking or shopping with their parents, the frequency of eating breakfast and homemade snacks at school, the frequency of consumption FF and their opinion of them. Statistical analysis was performed with SPSS-17.0, using ANOVA test, Bonferoni, post hoc analysis, Kolmogorov-Smirnov, and Pearson.

Results

In all, 10.7% of children had low adherence to the Mediterranean diet (MD), 44.4% moderate and 39.6% high. Of the children, 88% did not know what FF are, while 11.8% knew; 90.4% of those who knew what FF are did not know which foods are FF. Adherence to MD is not affected by the area where the children live (countryside or city) ($p=0.259$). Adherence to MD was negatively correlated with the hours of watching in front of screens (TV, tablet, laptop, mobile) and positively correlated with the consumption of breakfast ($p=0.000$) and homemade snacks at school ($p=0.000$) as well as the consumption ($p=0.000$), knowledge ($p=0.037$) and perception of functional foods ($p=0.024$). There was a positive correlation between FF consumption and the willingness to try new foods ($p=0.000$).

Conclusions

The results showed a positive correlation between MD adherence and knowledge and consumption of FF. Further research is needed to make definite conclusions.

Public Health Toxicol 2022;1(Supplement 1):A154

DOI: 10.18332/pht/149845

Characterization of *Lactobacillus rhamnosus*, *Levilactobacillus brevis*, *Lactiplantibacillus plantarum* and *Lactobacillus gasseri* metabolites and evaluation of their antimicrobial activity against food pathogens

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Lactic acid bacteria (LAB) play an important role as natural food preservatives. However, the characterization of the variety of their metabolites is limited. The increasing societal demand for less processed food products, while conserving those products' quality, safety and shelf-life, has raised the question of chemical preservative replacement. In this context, the LAB, as well as their metabolites, are alternatives of interest for use in food as bioprotective tools to fight microbial pathogen growth answering to consumer demands. The aim of this study was to determine the production of specific metabolites of *L. rhamnosus*, *L. brevis*, *L. plantarum* and *L. gasseri* by an optimized liquid chromatography with an ultraviolet/diode detection method and to investigate their potential antimicrobial activity against specific food pathogens. Based on the results of this study, the main metabolites detected in *L. brevis* were DL-p-Hydroxyphenyllactic acid (OH-PLA) (103.4 ppm) and vanillic acid (2.59 ppm), while OH-PLA (216.2 ppm), salicylic acid (19.0 ppm), vanillic acid (3.7 ppm), ferulic acid (6.9 ppm), benzoic acid (4.2 ppm) and 4-Hydrocinnamic acid (1.4 ppm) were identified in the *L. plantarum* strain, OH-PLA (147.6 ppm) and ferulic acid (4.9 ppm) were detected in *L. rhamnosus* and *L. gasseri* includes DL-p-Hydroxyphenyllactic acid (OH-PLA) (253.0 ppm), 1,2-dihydroxybenzene (12.68 ppm) and benzoic acid (7.83 ppm). Also, investigated the antimicrobial activity of the obtained cell-free-supernatants-CFSs incubation of the four LAB strains against pathogenic microbial species (*Salmonella enterica* ATCC14028; *Staphylococcus aureus* ATCC29213; *Escherichia coli* ATCC25922; *Klebsiella pneumoniae* ATCC700603). All obtained CFSs from LAB cultures showed significant inhibitory effects on the tested Gram negative and positive pathogens. The isolated LAB inhibited the growth of the tested pathogenic strains successfully, indicating that the addition of LAB strains in commercial food products may provide effective protection against infections caused by specific pathogens. This study provides alternative approaches for the molecules involved in the antimicrobial activity of food microorganism fermentation.

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Public Health Toxicol 2022;1(Supplement 1):A155
DOI: 10.18332/pht/149847

Evaluation of the effect of intermittent fasting on human health and well-being indicators

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Introduction

Intermittent fasting is one of the most popular trends for better health in recent years, helping modern people to get closer to biological situations that previously became familiar to them. It is a type of fasting that includes the feeding phase and the fasting phase that periodically alternates between them, forming the various shapes that even passed through the culture of peoples via religion such as Orthodox Christians, Muslims, and Adventists.

Methods

Bibliographic systematic overview was conducted of scientific articles and books to evaluate fasting breaks in human health and well-being indicators using international scientific databases such as Pubmed, Scopus, Web of Science, Google Scholar and Google Trends.

Results

Intermittent fasting is an example in the approach of weight loss and reduction of inflammation. Decreased insulin levels in combination with increased growth hormone secretion are the main reasons for its effectiveness as well as the release of catecholamines that promote fat burning. Oxidative stress and chronic inflammation are characteristic of the pathogenesis and progression of cancer and cardiovascular disease with a common risk factor of obesity. In this aspect, intermittent fasting activates cell signaling pathways by increasing antioxidant defence and DNA repair, by prolonging longevity and inhibiting the development of atherosclerotic plaque and by reducing the concentration of inflammatory markers such as IL-6 and CRP. It is generally a safe type of diet but also causes minimal unwanted neurological, hormonal, and gastrointestinal effects.

Conclusions

Intermittent fasting can be a factor in improving many health and wellness indicators by exerting a positive effect as an alternative diet model on the prevention of obesity, diabetes, cardiovascular disease, and cancer. However, more extensive clinical trials are recommended to investigate which diet model is more effective for each group of people.

Public Health Toxicol 2022;1(Supplement 1):A156
DOI: 10.18332/pht/149869

Gender-related prevalence, knowledge, and attitudes of Greek consumers towards dietary supplements

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Introduction

Many studies highlight variations in prevalence of dietary supplements (DS) use and its determinants across countries. However, survey data for DS use and its determinants amongst the general population in Greece remain limited.

Aim

The aim of this study was to investigate DS use, associated with gender and knowledge, beliefs and attitudes among 31823 participants of a large Greek cohort study.

Methods

Participants were interviewed face-to-face using a standard questionnaire. Data analysis (Pearson's chi-squared test, Z-test, correlation analysis) was performed using SPSS.

Results

The overall prevalence of DS use was 54.1%, and it was higher in females (56.8%) compared to males (51.1%). Females were more likely to report DS use for replenishing inadequate nutrients (39.4% vs 30.7%) or for treating diseases (33.1% vs 18.5), but males were more likely to report DS use for improving physical condition (47.5% vs 33.4%), increasing muscle mass (30.1% vs 4.5%) and improving athletic score (26.2% vs 7.0%). Furthermore, females seriously believed (56.0% vs 38.8%) that medical tests should precede any decision for DS intake. Also, they look more regularly for health professionals care and adhere strongly doctors' (56.0% vs 35.2%) and pharmacists' (47.8% vs 34.5%) recommendations. However, males adhere mainly coaches'/trainers' recommendations (27.8% vs 8.5%). Females were more convinced of their ability to evaluate DS safety, quality, and potential role to improve their health, while they consider more seriously the recommended daily allowance (56.0% vs 44.0%).

Conclusions

Females consider DS use mainly as therapeutic or preventive of diseases, and males as supportive of their physical appearance and exercise. Data on gender as determinant of DS use could be very useful to formulate interventions aiming to maximize benefits from their use.

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Public Health Toxicol 2022;1(Supplement 1):A157

DOI: 10.18332/pht/149870

A model for adding actionable sustainability information to Greek food databases

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Sustainable and healthy diets are important for overall planetary and human health, as the two are becoming more and more interconnected. Modern Nutrition Information systems must take sustainability into account, making it

easily available as a component for decision making and using it to provide better automated recommendations for personalized nutrition. Meanwhile, population awareness and perceptions on sustainability, as well as consecutive food choice behaviors are unclear, especially in Greece, a country that can leverage on the Mediterranean diet principles and its natural climate and resources, respectively, to easily promote a more sustainable diet. In this context, the demand for clear, actionable information on the sustainability of food choices is higher than ever.

Following a thorough literature review of the dimensions and variables of sustainability in food systems, such as seasonality and environmental footprint, we present the initial design principles and the respective workflows for creating and maintaining a 'Greek Food Sustainability Index', using a digital assessment model to provide actionable sustainability information for food and food products in Greece. This multi-layered model extends existing food databases with new properties and defines the ways to collect, assess and continuously update data through a 'digital observatory', using tools such as automated food availability and price scrapers and online consumer questionnaires. The model binds existing and new information using a built-for-purpose common semantic web ontology.

Creating such a model that will inform stakeholders on the sustainability of food choices in Greece, will improve our understanding of the involved factors and contribute to the growing demand for sustainable and healthy diets on a national level.

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Public Health Toxicol 2022;1(Supplement 1):A158

DOI: 10.18332/pht/149701

Ultrasound-assisted extraction coupled to HPLC-UV for the determination of quercitrin in different Rosa species genotypes and determination of their antioxidant capacity

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Secondary plant metabolites, such as flavonoids, have been associated with several health benefits for the human organism^{1,2,3}. For this reason there is an ever-growing interest in the food industry for natural products that are rich in bioactive constituents. Roses (*Rosa L.*), the most widely cultivated flower in the world, have always been appreciated for their unique organoleptic properties. However, there is limited information available concerning their phytochemical profile as well as their antioxidant capacity, and their potential use as an alternative source of natural ingredients in the food and cosmetics industry. In this study, a rapid HPLC-UV protocol was developed to determine the concentrations of quercitrin in six different genotypes of red roses. Furthermore, DPPH assay was applied to measure total antioxidant capacity. ANOVA statistical analysis was applied to the results, which showed no significant statistical differences among the genotypes in terms of total antioxidant capacity. The ANOVA test revealed, however, significant statistical differences in the concentrations of quercitrin among the genotypes, implying that the concentrations of individual phenolic compounds vary among the genotypes.

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Public Health Toxicol 2022;2(Supplement 1):A159

DOI: 10.18332/pht/150229

Workload and nutritional monitoring in sports

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Workload monitoring and determination in sports contributes significantly to the smooth management of training load. There has been widespread use of advanced systems for locating and determining athletes' instant positioning and space-time alterations in recent years. Athletes' monitoring systems during training and competition are used routinely, particularly in high-performance sport. Practitioners in elite sports are required to collect, analyze, and interpret information on their athletes. Recorded biometrics during training and games/ events, athletes' response to the training/ competition stimulus, perceptual stressors and readiness level, subsequent training prescription, and implementation of other applications are also determined towards a holistic external and internal workload determination approach. Proper nutritional monitoring and intervention could prevent overtraining and maladaptation by maintaining energy balance. Nutritional strategies during high workloads require: a) energy intake >30 kcal·kg⁻¹; b) adequate amounts of carbohydrates (6-10g·kg⁻¹), and/or carbohydrate loading (8-12g·kg⁻¹); c) sufficient amount of proteins (1,2 - 1,6g·kg⁻¹); and d) vitamin D (100mg) from Autumn to Spring.

Moreover, abundant amounts of antioxidants, vitamins and minerals, especially iron and selenium, and also probiotics are deemed necessary. The current seminar aims to present the physiological requirements and capacities of elite athletes, the development and utilization of new technologies for workload monitoring in sports and its utilization in performance optimization and management of injury risk. In addition, it provides a thorough overview of the contemporary systems, applications and evidence in athlete monitoring as well as applied examples of best practice from high-performance sport. In particular the science underlying athlete monitoring approaches, general principles of application, and best implementation practices are presented.

Goals

Presentation of current major technologies and applications in athletes monitoring;

Determination of external and internal workload measures in footballers;

Presentation of footballers' self-report measures on perceptual well-being;

Determination of objective and subjective measures of 'readiness to train/compete';

Analysis, interpretation of real workload data and utilisation in training prescription.

Public Health Toxicol 2022;2(Supplement 1):A160

DOI: 10.18332/pht/150590

APPENDIX

Carlo Agostoni

Chairman in Pediatric Intermediate Care Unit, and Pediatric Emergency-Urgency Unit, Fondazione IRCCS Ca' Granda-Ospedale Maggiore-Policlinico.

Professor of Pediatrics, Department of Clinical Sciences and Community Health, University of Milan.

Director of the Postgraduate School of Pediatrics.

Degree in Medicine and Surgery (1983), Postgraduate in Pediatrics (1987), in Neonatology-Neonatal Pathology (1990) and in Social Pediatrics-Infant Care (1995), University of Milan.

Member of the ESPGHAN Committee of Nutrition (1999-2007).

Expert of EFSA (European Food Safety Authority) since 2008; member of the EFSA NDA (Nutrition, Dietetic products and Allergy) Panel for the three year mandates 2009-2012 and 2012-2015, respectively.

President of the Italian Society of Pediatric Gastroenterology Hepatology and Nutrition (SIGENP) for the period 2016-2019. Member of the European Academy of Allergy and Clinical Immunology (EAACI) since 2019.

Since 2010 Lecturer at the Courses in Pediatrics for the Faculty of Medicine and Surgery (University of Milan).

His current research activities focus on lipids and fatty acids, functional nutrients, preventive nutrition and dietary management of chronic inflammatory paediatric disorders.

Author of more than 400 publications on International Peer Reviewed Journals, according to JCR, total (1985-2021) IF is > 1.000. H-index: Scopus 58.

Giannis Arnaoutis

Assistant Professor, School of Health Science & Education, Department of Nutrition and Dietetics, Harokopio University, Athens, Greece.

Giannis Arnaoutis is an Assistant Professor in the Department of Nutrition & Dietetics teaching the Modules of "Nutrition & exercise" and "Sports nutrition for elite athletes" in the pre-

and post-graduate courses. He has obtained his Bachelor's degree on Physical Education and his Master and Ph.D. degree on Applied Nutrition and Dietetics (expertise in Sports Nutrition) by the School of Health Science & Education. Currently he is the Director of the Nutrition & Ergometric Center of Bioatrikiplus. Giannis Arnaoutis is an expert in the hydration field, with numerous publications in international peer-reviewed journals and book chapters. His scientific interests include: hydration status and performance, the relationship between hydration and health and regulation of fluid and electrolyte homeostasis. He has presented in more than 40 invited Symposia and Keynote Lectures at national / international scientific meetings. He has received the 1st Young Researcher Award in the Hydration for Health Scientific Conference for his project: "The Effect of Hydration Status on Endothelium Function".

Georgios I. Arsenos

Georgios I. Arsenos, Qualified as a Veterinarian from the School of Veterinary Medicine of the Aristotle University, Greece in 1993. In 1997, at the same University, he was awarded a Doctoral Thesis in Animal Husbandry. He holds also a Ph.D in Behavioural nutrition awarded from the University of Edinburgh in 2001. He is currently professor in Animal Production, Ethology and Animal Welfare at the School of Veterinary Medicine, Aristotle University, Greece. He has vast experience in Animal Science research and education. He has well-established international links and reputation in research and extension services to industry. His scientific expertise includes veterinary medicine, animal breeding and genetics, data analysis and sustainability of livestock production systems. He held research and academic positions in the UK and has been leader or partner in several National, industry and EU-funded research projects. Building collaboration with stakeholders has been a strong qualification and led to several awards for Research excellence and novelty from the Research committee of the Aristotle University. Highlights of service outside the University include numerous seminars for farmers, regular farm visits to individual farms, farm cooperatives and dairies that have a contract for extension services with the Laboratory of Animal Husbandry. <https://scholar.google.co.uk/citations?user=21AKOP4AAAAJ&hl=en>

Silvia Bettocchi

Nutritionist, specialized in the field of pediatric nutrition.

- 2011 Bachelor's Degree in Biological sciences at University of Pisa
- 2014 Master's Degree in Nutritional sciences at University of Milan
- 2020 PhD in Agro-food System at Università Cattolica del Sacro Cuore, Piacenza

Since 2013, her research activity in the field of pediatric nutrition, at the Pediatric Clinic - Ospedale Maggiore Policlinico in Milan, includes the assessment of resting energy expenditure in hospitalized children, the association between nutrients and neurocognitive development, and the correlation of fatty acids, gut microbiota and different chronic or acute disease in childhood.

During her PhD research program, she went to Austin as visiting fellow at Dell Pediatric Research Institute – Dell Medical School, The University of Texas. Her research activity has been focused on a putative influence of a regulatory insertion-deletion polymorphism in the FADS gene cluster on polyunsaturated fatty acid (PUFA) and lipid profiles at Brenna's Laboratory.

Ioana Corina Bocsan

Specialist in Allergology and Clinical Immunology and in Clinical Pharmacology. Currently she is working as associated professor in Pharmacology Department, „Iuliu Hatieganu” University of Medicine and Pharmacy, Cluj Napoca, Romania. She received a Master Degree in Clinical Pharmacology in 2003 and the PhD degree in 2011, based on research on inflammatory mechanisms in allergic rhinitis. She has a large experience in experimental and clinical inflammation, especially in allergic inflammation. She developed her skills in different lab techniques after a EAACI research fellowship followed by continuous collaborations with specialists from National Heart and Lung Institute, Imperial College London. She is involved in research projects in the field of innate and adaptative immunity and viral infections. She is also partner in a research project in Health Economics. Her research interests are focused on inflammatory markers in allergic rhinitis and asthma, on vitamin D in infections and food allergy. She published more than 100 articles and 9 books and in both allergology and pharmacology fields. She is a vice-president of Romanian Society of Allergology and Clinical Immunology and member of European Academy of Allergology and Clinical Immunology and European Association for Clinical Pharmacology and Therapeutics.

João Breda

Head of the Athens Quality of Care Office & SPECIAL ADVISER for the Regional Director.

João Breda is the Head of the new Athens Quality of Care Office and Special Adviser of WHO Regional Director for the establishment of Sub-Regional Offices. Before moving to Greece João has been posted in WHO Senior Positions in Copenhagen (Denmark) for seven years and Moscow (Russian Federation) for four years. The newly established Athens Centre of Excellence aims to improve quality of care and patient safety at country level and focusing on reducing inequalities while promoting health innovation and leadership. He is known for his teamwork, leadership skills (including great team player and high EQ and diversity promoter) and fundraising ability which led to attract around 100 million USD from major international donors, especially countries and other stakeholders, notably philanthropists, during his tenure of 12 years at WHO. Dr. Breda is also part of the WHO roster for Heads of Country Offices and WHO Representatives (WR).

Until recently he Headed the WHO European Office for the Prevention and Control of Noncommunicable Diseases (NCD Office), which is an integral part of the WHO Regional Office for Europe. Launched in Moscow in 2014, the NCD Office marked an important milestone in the commitment made to combatting NCDs in the WHO European Region.

Led by Dr Breda, the NCD Office provided support to 53 Member States in the WHO European Region based on population-level, targeted approaches to ensure a reduction in NCD risk, an overall decline in premature mortality. In 2019, the team he was leading was given an Award of Excellence announced by Dr Tedros Adhanom Ghebreyesus, WHO Director-General, which acknowledges the exceptional contribution to the Organization, tangible gains, and achievements.

For eleven years João Breda was Programme Manager for Nutrition, Physical Activity, and Obesity at the WHO Regional Office for Europe, responsible for the implementation of the European Food and Nutrition Action Plan 2015-2020 and the Physical Activity Strategy for the WHO European Region 2016-2025, as well as evaluating their implementation process.

Dr. Breda was also the recipient of the Gold Medal for outstanding services in the field of Health granted by the Portuguese Ministry of Health in 2018. He also received more than 20 scientific and academic awards and/or distinctions notably the Honorary Professorship by the Medical Academy of Kazakhstan 2018, the Gerlev Award 2016 (Denmark) and gold medals for his work in the area of obesity particularly in children by the Polish Institute of Maternal and Child Health (2021) and the Nutritionists Professional Order 2021 (Portugal). João Breda has published more than 250 original academic articles and reports, as well as more than 20 original books (including the best seller on infant nutrition in Portugal) and has more than 10000 citations. He is also considered to be among the top 1% researchers on obesity, globally.

Before joining WHO, Dr Breda was the Portuguese focal point to WHO/Europe for alcohol, nutrition, and physical activity, and to the High-Level Group on Nutrition & Physical Activity and the European Platform on Diet, Nutrition and Physical Activity of the European Union.

He was the first coordinator of the national platform against obesity under the Portuguese Ministry of Health. He worked as a public health official at the general Health Directorate of Health for many years. He was the Head of the Nutrition Department at Atlantic University in Lisbon as well as lecturer and researcher at the Agriculture University of Coimbra (ESAC), the University of the Algarve and the School of Hospitality and Culinary Arts in Coimbra.

Dr João Breda is a PhD in Food Consumption & Nutritional Sciences by Porto University, a Master of Business Administration, a Master's in public health and initially graduated in Nutritional Sciences. He is proficient in English, Spanish and Portuguese (mother tongue), intermediate knowledge of French and basic Russian.

Dimitrios C. Cassimos

Medical school of Athens University, 1986.

Post graduate Training:

1. G.P Vocational Training in "National Hospital " of Athens.
2. M.D Thesis «Epidemiology of childhood leukemia in Greece» Medical school of Athens, 1994.
3. Training in Paediatrics in U.K 1992- 1999.

Post graduate Training in Allergology - Immunology:

1. "Gr.Ormond Str." Hospital U.K, 1997-1999.
2. "St.Mary's" Hospital U.K, 1997-1999.
3. "Aglaia Kyriakou "Children's Hospital, Athens Greece, 1999-2001.
4. "Aghia Sophia" Children's Hospital, Athens Greece, 2001 Present

Assistant Professor of Paediatrics, Paediatric clinic, Democritus University Hospital of Alexandroupolis, Greece. Clinical Paediatrics, in patient and out patient clinics. Training of medical students and trainees in Paediatrics.

Research: Allergology, nutrition, infectious diseases.

Special interests

Allergology Immunology, Nutrition, Infectious Diseases.

Costas Chryssanthopoulos

I graduated (BSc) from the Department of Physical Education & Sports Science of the National & Kapodistrian University of Athens (NKUA). I earned my MSc and PhD from the Department of Physical Education, Sports Science & Recreation Management of Loughborough University of Technology, England, UK. My postgraduate studies were on Human Metabolism, Sports Nutrition and Performance. I am currently in the Laboratory of Physiology of the Medical School in the NKUA as Special Teaching Staff. My research interests are focused on the benefits of exercise and physical

activity on clinical populations such as diabetic, obese and hypertensive individuals, and on sports nutrition strategies for maximizing human performance.

Efstratia Daskalou

Clinical Dietitian and Nutritionist PhD, MSc, BSc, and currently serves at the Nutrition Department of G.Gennimatas General Hospital, Thessaloniki, where she is a member of the nutrition support team at the Pediatric Department. Holds a Doctoral Degree in Clinical Nutrition, from the Medical School of Aristotle University of Thessaloniki. She is an Academic Teaching Fellow of the International Hellenic University in the scientific field of Clinical Nutrition. She is a co-author in several peer reviewed publications in international scientific journals. Has been involved in numerous trials and projects related to malnutrition and pediatric nutrition. Focuses in the fields of nutritional screening and assessment, medical nutrition therapy for hospitalized patients, pediatric nutrition, enteral nutrition, dietary planning, pharmaceuticals and nutraceuticals.

CV-DE COSMI-ICONSD 2022

Valentina De Cosmi

Biologist who graduated in Human Nutrition with PhD in Epidemiology. She is a post-doc researcher in the field of pediatric nutrition and nutrition epidemiology at the Department of Clinical Sciences and Community Health, University of Milano, Milano, Italy. Her topic areas of interest are the evaluation of resting energy expenditure of both healthy and critically ill children; the evaluation of nutritional habits and body composition; the analysis of fatty acids profile; the Mediterranean diet and the adherence to the Mediterranean diet in children; the dietary patterns and their sustainability for the planet; the role of diet and nutrients in preventing non-communicable diseases; nutrition in the prevention and management of food allergies; the epidemiological determinants of infertility.

Education and training

- 2018 PhD in "Epidemiology, Environment and Public Health" XXXI cycle, University of Milano, Italy.
- 2013 Master's degree in "Human Nutrition and Food Science" University of Milano, Italy.
- 2011 Bachelor's degree in "Medical and Pharmaceutical Biotechnologies", Vita-Salute San Raffaele University, Milano, Italy.

Current position

Post-doctoral fellowship at the Department of Clinical Sciences and Community Health, University of Milano, Italy.

Olga Deda

Biochemist-Biotechnologist with M.Sc. and PhD in Analytical Chemistry. She has been working since 2017 in Laboratory of Forensic Medicine and Toxicology, School of Medicine, Aristotle University of Thessaloniki as a Post-Doctoral Researcher on Metabolomics-based studies of complex diseases for the discovery of biomarkers with the Assistant Prof. H. Gika.

She works on LC-MS, GC-MS and NMR spectroscopy metabolic profiling and biochemical interpretation of the obtained data. From November 2019, she has been implementing her postdoctoral research fellowship by the State Scholarships Foundation (IKY) on "Study of gut microbiome and metabolome for the biomarkers discovery of colitis derived from antibiotics".

Her research activities include also the metabolomics-based biomarker discovery of Coronary Artery Disease, of alcohol toxicity biomarkers, of beneficial effects of carobs in gastrointestinal disorders, as well as the biochemical interpretation

of neonatal necrotizing enterocolitis and intraventricular hemorrhage markers.

Her previous research activities include among other the standardization of analytical metabonomics, sample preparation optimization in fecal metabolic profiling, metabolomics-based methods for the discovery of exercise and aging biomarkers in mammals, the effect of allopurinol administration on carbohydrates and lipids metabolism during exhaustive aerobic exercise in rats, biochemical interpretation of metabolomics data on shikonin's cytotoxic activity in the Huh7 human hepatoma cell line and the method development for the automated selective fluorometric determination of histamine in seafood samples based on the concept of sequential injection analysis (SIA).

George Dedoussis

Professor of Molecular Genetics and Nutrigenetics at the Department of Science in Nutrition-Dietetics of Harokopio University in Athens. He received his PhD from the Medical School of Athens. He worked as a researcher on a Fulbright scholarship at the Medical Faculty of the 'Harvard University' (Boston, USA). In 2018 he received "The Gutenberg Chair" from the Region Grand Est, Euro metropole de Strasbourg. He has published more than 330 papers and his research work has been recognized by others (number of citations > 60.000, h-index: 91). He was nominated in 2019 among the most cited scientists worldwide during the last decade. He has coordinated many national and European grants in the field of genomics of obesity, myocardial infarction and Non-Alcoholic Fatty Liver Disease (NAFLD). He is also testing the impact of natural compounds on NAFLD patients and he was the coordinator of a Marie Curie RISE European grant (www.MAST4HEALTH.eu).

Detopoulou Paraskevi

Paraskevi Detopoulou works as clinical dietitian at the General Hospital Korgialenio Benakio (Athens, Greece) and since 2016 she is Head of the Department of Clinical Nutrition at the same hospital. In parallel, since 2019 she is teaching staff at the Department of Nutritional Studies and Dietetics at the University of the Peloponnese, while she has served as teaching staff at Harokopio University and the Technological Institution of Thessaloniki. She has more than 26 publications in international scientific peer reviewed journals, 9 book chapters in Greek and English scientific books and one book coauthored with Prof Emeritus CA Demopoulos entitled "Nutrition, Mediterranean diet and Diseases: a focus on cardiovascular disease" (NEON publications, 2021). She has more than 40 Greek and international conference presentations, she is a reviewer in international and Greek journals and international innovation competitions and has participated in several educational programs of the European Institute of Innovation and Technology (EIT Food and EIT Health). Moreover, she is a member of the Greek Reference Group of the International Dysphagia Diet Standardization Initiative (IDDSI). She has obtained several scholarships and awards from the State Scholarship Foundation (IKY), Harokopio University (postgraduate studies), the Hellenic Atherosclerosis Society, the European Atherosclerosis Society and the US National Lipid Association.

Charilaos Dimosthenopoulos

Charilaos Dimosthenopoulos received his PhD from the Medical School of the Kapodistriakon University, Athens. He holds a Bachelor degree on Biology from the School of Biology of the Aristotle University of Thessaloniki, a Postgraduate Diploma (PostDip in Dietetics) in Dietetics from Leeds Metropolitan University and a Master of Medicine and Science

in Human Nutrition (MMedSci) from Sheffield University, UK. He holds a HACCP Inspector Certificate from the Agricultural University and TUV AUSTRIA. He works as Chief Dietitian of the Department of Clinical Nutrition, at the General hospital of Athens "Laiko" being responsible for the dietary monitoring and treatment of patients of various clinical conditions, since 2002. He has numerous publications while he has numerous participations in Greek and International congresses with oral presentations, abstracts and posters. He is Board member of the Society for the Study of Risk Factors for Vascular Diseases (EMPAKAN) and Board member of the Hellenic Diabetes Society (EDE). He is member of the Executive Committee of the Diabetes and Nutrition Study Group (DNSG) and was the Leader of the EFAD's European Specialist Dietetic Networks (ESDNs) Diabetes (2018-2022). He is teaching in 4 different postgraduate programs of the Kapodistriakon University and the University of West Attica, Athens.

Christos Diou

Assistant Professor of Artificial Intelligence and Machine Learning at the Department of Informatics and Telematics, Harokopio University of Athens, Greece. He received his Diploma in Electrical and Computer Engineering and his PhD in Machine Learning for Multimedia Analysis from the Aristotle University of Thessaloniki, Greece. He has published over 70 papers in international research journals and conferences on topics related to Artificial Intelligence, Machine Learning and their applications in health, energy and multimedia retrieval. He also has over 15 years of experience participating in international research projects. He is currently the PI of project REBECCA, aiming at the use of multiple sources of real-world data for improving research on the quality of life of breast cancer patients. His recent research interests include the development of methods measurement and modeling of human behavior for health applications, the development of machine learning approaches that generalize to out-of-distribution sampling and the use of machine learning for causal effect estimation from observational data.

Gavriela Maria Feketea

Consultant Pediatrician Allergist, has graduated from the „Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj Napoca, Romania and completed her training in specialty of Pediatrics at University Hospital of Patra, Greece. She has been awarded with a research fellowship at Department of Respiratory Medicine, Imperial College London, where expertized in different laboratory techniques. Also, she was Honorary Clinical Fellow at Pediatric Allergy Department, St Mary's Hospital, Imperial College Healthcare NHS Trust, London and has a master's degree in Allergology from Imperial College She has successfully passed the Knowledge Examination of the European Academy of Allergology and Clinical Immunology (EAACI) being awarded with the Certificate of Excellence in Allergology and Clinical Immunology. Her PhD thesis referred to the relationship between vitamin D and viral respiratory infections in atopic children. She is member of different professional societies: Greek Pediatric Allergy Society (GPAS), Romanian Society of Allergology and Clinical Immunology and EAACI. Furthermore, she serves as treasurer of GPAS and as board member of Allied Health & Primary Care Section of EAACI. Currently she is Medical Director and head of Pediatric Department, General Hospital of Amaliada and head of Outpatient Pediatric Allergy Clinic, Karamandaneio Children's Hospital, Patras, Greece.

Gerda Feunekes

Gerda Feunekes (1965) is leading the Netherlands Nutrition

Centre since 2014. This centre with 85 employees is in the Netherlands the authority that translates nutrition science to the consumer, to stimulate healthy and sustainable eating habits. The Netherlands Nutrition Centre is an independent foundation, jointly funded by the Ministry of Health, and the Ministry of Agriculture. Gerda is focused at making impact in the world of nutrition, health and sustainability and has experience in academia, industry, and public sector. MSc in Nutrition (1989) and PhD in Food Choice (1996) from Wageningen University.

In various advisory committees, e.g. EIT Foods (EU); Wageningen UR Social Sciences; World Food Centre; National Breastfeeding Council. Chair of the European Public Health Nutrition Alliance (EPHNA), where European centres responsible for nutrition communication have joined forces.

Georgios D. Floros

I was born in Thessaloniki, Greece, in May 1974. I am a licensed Adult Psychiatrist since 2011.

I completed the M.Sc course "Medical Research Methodology - Clinical Research" from the Medical School of the Aristotle University of Thessaloniki (AUTH) in 2006 and my PhD thesis was conducted in the 2nd Department of Psychiatry of the AUTH in 2015

I am currently employed as a Consultant Psychiatrist in the 2nd Department of Psychiatry of the AUTH.

I was a founding member of the Hellenic Association for the Study of Internet Addiction Disorder in 2008 and currently serve a third term as Vice Chairman of the Board.

My general research output includes forty published research papers in peer-reviewed journals, (ORCID ID 0000-0001-8193-3571), my h-index is 21 and i10-index is 32. I am an Editorial Board Member of BMC Psychiatry (Impact factor=3.63) section 'Substance-related disorders, addiction and impulse control' and Frontiers in Public Health (Impact factor=3.7)

Since April 2021 I am a member of the National Standing Committee to monitor the implementation of the Mental Health plan; Since April 2022 in the Committee of the Hellenic Psychiatric Association for the training of psychiatry residents.

George A. Fragkiadakis

Associate Professor of "Nutrition and Metabolism", Hellenic Mediterranean University, School of Health Sciences, Department of Nutrition and Dietetics Sciences, Sitia, Crete, Greece (2003-). His scientific interests focus on: "Comparative Biochemistry and Metabolism of Animal Organisms", "Microbiology and Food Hygiene/Safety in Human Nutrition", "Nutrition of Vulnerable Population Groups, Children and the Elderly", "Eating Habits and Health". He worked at the University of Thessaly (1999-2001) and at the University of Crete (2001-2002, as an adjunct teacher of "Biochemistry" by the Greek-Law Presidential-Decree 407/1980. He worked under contract (1996-1999), at the National Agricultural Research Foundation (NAGREF/ETHIAGE, now ELGO-DIMITRA), as a researcher in Applied Molecular-Biology and Plant-Fungus Biochemistry. He has been a scholarship holder from the Institute of Molecular Biology and Biotechnology of the Institute of Technology and Research, Greece (ITE-IMBB), in the period 1988-1995. Titles: I). Doctor (Dr. of Science) in Biology with subject specialty "Biochemistry" (University of Crete, Department of Biology, Laboratory of Biochemistry, 1990-1995). II). Postgraduate Specialization Diploma (Master of Science) in Biology (University of Crete, 1988-1990). He has published 35 complete articles in international peer-reviewed journals, of which he received (4.2022) approximately 1,000 hetero-references (h-index 16, i10-index 22). In addition, he

has published 39 full articles in conference proceedings.

Rodios Gamvros

Education

Degree on Chemistry, University of Thessaloniki 1971.

Rodios Gamvros is chairman of Scientific Committee at Hellenic Food industry federation (SEVT) since its creation at 1991. Under this capacity he represented Hellenic Food Industry in numerous Working Groups and Committees both at EU and National level.

He has a long (32 years experience) on Quality systems, food safety and regulatory topics within food industry, as he was Quality Manager of Nestle in South Eastern Europe Region (Greece, Bulgaria, Romania, Cyprus Albania, and Western Balkans) since 1989 till retirement in August 2010.

His carrier with Nestle started as factory Quality Assurance Manager of Nestle dairy factory at Platy (Greece) from 1978 to 1989.

For his achievements on quality, he was nominated Quality leader 2007 for Greece an honour granted on behalf of European Quality Organization (EQO).

Today in parallel to chairmanship of SEVT Scientific committee he is

- Member of Steering board of Greek branch of "Food for Life" platform.
- Member Scientific Council ESET, by main State Controlling Authority EFET on 4 terms till 2019.
- Member of Consumers National board representing Industry federation (SEV)

He also was

- Member of Supreme Chemical Council for 1 term (1995-1997)
- Member of Council at Agricultural University of Athens till August 31st 2016.

Konstantinos Gerasimidis

Professor of Clinical Nutrition at Human Nutrition, School of Medicine, University of Glasgow. He has graduated in Nutrition and Dietetics from ATEI Thessalonikis and completed his postgraduate studies in Clinical Nutrition, University of Glasgow. During his doctoral research at the University of Glasgow, he explored the effect of exclusive enteral nutrition on the gut microbiota and nutritional status of children with Crohn's disease. Professor Gerasimidis also a laboratory team which explores the role of gut microbiota and its interaction with diet in the onset, propagation and management of acute and chronic conditions. He has a strong interest in exploring the effect of habitual diet, elimination diets and artificial nutritional support on the gut microbiota of children and adults with inflammatory bowel disease. He has a cumulative research income which exceeds the £8.9M and more than 115 publications in peer-reviewed literature. Hi current teams consist of 5 post-doctoral researchers, one research assistant, 3 clinical research fellows and 5 PhD students all funded externally and from competitive grants.

Parthena Giannoulaki

Clinical Dietitian with BSc in Nutrition and Dietetics, MSc in Public Health, and a Ph.D. candidate in the Medical School of the Aristotle University of Thessaloniki. She works in AHEPA, University General Hospital of Thessaloniki. She is the Head Dietitian of the Department of Nutrition and Dietetics and the Nutrition Advisory Outpatient Office, instructor and coordinator of the MSc course in Clinical Nutrition at the Department of Nutrition and Dietetics of the International Hellenic University, an invited speaker of the MSc course in "Advanced Methods and Technologies in Treatment of Diabetes

Mellitus,” the MSc course in “Applied Nutrition and Health Promotion” of the Medical School of the Aristotle University of Thessaloniki and many scientific conferences. She has participated in writing chapters in scientific books and oral presentations at conferences, seminars, and workshops, in Greece and abroad. Also, she has published papers in scientific journals. She has been training patients with diabetes type 1, type 2, and gestational diabetes since 2005 and specializes in medical nutrition therapy for diabetes mellitus type 1 with advanced technologies in the treatment.

Gkouskou Kalliopi

Assistant Professor of Biology & Genetics, School of Medicine, National and Kapodistrian University of Athens (NKUA).

Kalliopi Gkouskou is Assistant Professor of Biology & Genetics at the National and Kapodistrian University of Athens (NKUA), School of Medicine. Her research focuses on 1) gene-diet interactions in the regulation of metabolism with an emphasis on obesity and diabetes and 2) on basic mechanisms of regulation of metabolic pathways.

Dr Gkouskou received her BSc in Biology from the University of Crete (UC), in 2001 and an MSc in «Molecular Biology and Biomedicine» from the same Institution in 2003. Upon completion of her MSc training, she joined the Institute of Molecular Biology & Biotechnology (IMBB) in Heraklion as a PhD candidate, supported by a national grand and an EMBO scholarship. She continued her training as a post-doctoral researcher at IMBB and at the UC Medical School. As part of this post-doctoral work, she was trained in medical genetics applications in genomic technologies at the Cancer Research Center of the University of Liverpool.

Having acquired a strong basic research background in Biology and Genetics, in 2015, Dr Gkouskou established the SME Embiodiagnostics with the ambition to provide innovative genetic services for personalized dietary and lifestyle interventions. One of the best developed Embiodiagnostics products is the nutrigenetic test GENOSOPHY® which is the outcome of her persistent research in partnership with leading academic institutions in Greece.

Maria Hassapidou

Maria Hassapidou is a Professor in the department of Nutritional Sciences and Dietetics of the International Hellenic University. She is also the Coordinator of the post-graduate course on Nutrition and Dietetics and head of the Human Nutrition research group.

She has coordinated and/or participated in many research projects funded by the EU (Health, Diets I and II, Healthgrain, EURRECA, JANPA, PROTEIN, BigO), the Greek Ministries of Health, Education, Research and Technology as well as food and pharmaceutical companies, in the areas of dietary assessment and nutritional evaluation, dietary treatment of obese patients with cardio metabolic diseases and childhood obesity.

She is the national coordinator in Greece for COSI (WHO European Childhood Surveillance Initiative), chair of NWG (Nutrition Working Group) of EASO, member of the EASO Childhood Obesity Task Force and chair of the European Specialized Dietetic Network (ESDN) of EFAD on Obesity. She is a member of the Hellenic Nutrition Policy Committee of the Greek Ministry of Health.

She has authored several books and has published more than 100 scientific papers in peer-reviewed journals and conference proceedings in the areas of nutrition and obesity. She is also a reviewer in many related European and International journals.

Sebastian A. Jensen

Already throughout his studies at the Medical University of Vienna, Sebastian A. Jensen, M.D. developed a great interest in scientific research, with a focus in the area of clinical allergology. He was able to acquire clinical practice in the past 10 years working with allergic patients. Dr. Jensen is today employed as clinical scientist at the University Clinics for Ear, Nose and Throat Diseases of the Medical University of Vienna, where he is engaged in clinical trials with allergic patients. He has a deep interest in the association of iron parameters with clinical reactivity in pollen allergic women, and coauthored several publications.

Jensen-Jarolim

Erika Jensen-Jarolim, MD, is professor at the Medical University Vienna. She is president of the Austrian Society for Allergology and Immunology (ÖGAI) and co-Editor in Chief of the World Allergy Organization Journal.

She is Clinical Immunologist by training and specialized in allergology, with special interest in allergen molecules. In daily clinical practice she applies precision allergy diagnosis for her patients, while in research over more than 3 decades she focused on one major question: What makes a (food) protein an allergen? With her team she proved that allergen ligands with micronutrient function make the difference and can in fact turn proteins into tolerogens, while the empty proteins have a higher potential for allergenicity. This discovery led to the development of a FSMP lozenge against allergies, which will be presented at this meeting.

Erika Jensen-Jarolim has a scientific oeuvre of more than 280 publications in PubMed.

Jolien Jonckheere

Jolien Jonckheere (1996) graduated in 2020 from the master Nutrition and Health in Wageningen and immediately started working at the Flemish Institute of Healthy Living (Belgium). This organization works on public health and health promotion in multiple settings, focusing on multiple themes: nutrition, physical activity and sedentary behavior, tobacco, mental health, using expertise in behavioral change and working towards socially vulnerable people.

Jolien was involved in the process of integrating health and environmental aspects into the Food Triangle and implemented these recommendations into guidelines for specific settings, e.g. for schools. She worked on ultraprocessed foods. The Flemish Institute of Healthy Living is mainly funded by the health department of the Flemish government and is also member of the European Public Health Nutrition Alliance (EPHNA).

Anastasia Z. Kalea

Associate Professor (Teaching) in the Division of Medicine, an Honorary Associate Professor of the Institute of Cardiovascular Sciences and a Director of the MSc in Obesity and Clinical Nutrition at UCL.

With over 20 years of research experience, she has contributed to answering key questions on the role of dietary compounds in metabolic regulation and vascular function. Her research interests rely in the areas of precision nutrition and public health.

Dr Kalea has been a lecturer in world-leading academic institutions (UK, USA), is a Senior Fellow of the Higher Education Academy, is a registered Dietitian with the Health and Care Professions Council, a Board member of the Nutrition Society and a member of the British Dietetic Association. She served as an advisor for international collaborations (Gene Ontology Consortium), as a scientific committee member

in national/international scientific conferences, and as an editor and reviewer for peer-reviewed international scientific journals.

Thomai Karagiozoglou-Lampoudi

Pediatrician-Pediatric Gastroenterologist.

Professor Emeritus of Clinical Nutrition, IHU.

Member of the National Committee on Nutrition Policy.

Editor in Chief in *Pediatriki* of N. Greece, the official journal of the Pediatric Society of N. Greece.

For 17 years she was involved in pediatric patient care as well as in clinical research, working in a hospital as a Pediatric Gastroenterologist. ThKL's major research interests are: the molecular basis of energy homeostasis, medical decision-making on nutrition cases, adverse food reactions, malnutrition, and nutrition support as well as Bioethics. She contributed to research projects funded by national as well as European Community resources. She contributed as an author in research publications and in books on topics related to Pediatric Gastroenterology Hepatology and Nutrition.

ThKL is a founding member of the Hellenic Society of Pediatric Gastroenterology Hepatology and Nutrition and served repeatedly as a Council member (President during 2008-2010). She is an active member of the Pediatric Society of N. Greece and served repeatedly as a Council member (President during 2012-2015). She is an ESPGHAN member, as well as a member of other international scientific societies. She serves as a reviewer and Editor in many scientific journals and she is a member of the Editorial boards in three of them.

Vasileios Karalazos

Senior researcher, BioMar Global R&D, Greece

Vasileios Karalazos is a Senior Scientist in the global Research & Development Department of BioMar, a world leading aquafeed producer. He has more than 15 years of experience in the academia and the industry on nutrition research and feed development. He holds a bachelor's degree and an MSc in Animal Science from the Aristotle University of Thessaloniki (Greece) and a PhD on fish nutrition from the University of Stirling (UK). His research interests include fatty acids and lipids, nutritional requirements, and bioenergetics. He has led and participated in more than 60 research projects on fish nutrition and feed development. He has also participated in several EU and national funded projects collaborating with academic and research partners from several countries including the UK, Spain, Greece, Norway and France. He has experience in teaching at undergraduate and post-graduate levels as well as in supervising and mentoring doctorate students and young researchers in Greece, UK, Norway etc. He has co-authored 30 peer reviewed papers in International scientific journals (h-index: 20) and more than 35 presentations in international conferences.

K. Karatzi

Assistant Professor of Clinical Counselling and Dietary Behavior.

Laboratory of Dietetics and Quality of Life.

Department of Food Science & Human Nutrition.

School of Food and Nutritional Sciences.

Agricultural University of Athens.

K. Karatzi is an Assistant Professor of Clinical Counselling and Dietary Behavior at the Department of Food Science and Human Nutrition, Agricultural University of Athens. She has BSc, MSc and PhD in the field of Nutrition and Dietetics from Harokopio University of Athens. She is also, a Research Associate at the Cardiovascular Prevention & Research Unit, Clinic & Laboratory of Pathophysiology, Department of

Medicine, National and Kapodistrian University of Athens, at the Cardiovascular Research Laboratory, 1(st) Department of Propaedeutic and Internal Medicine, Laiko Hospital, Athens University Medical School and at the Vascular Laboratory of Therapeutics Clinic, Alexandra Hospital, Athens University Medical School. Her scientific interests include dietary behavior modification, clinical counselling regarding lifestyle changes, dietary behavior in association with early vascular damage, diet in relation to childhood and adult hypertension, behavioral, sociodemographic and clinical risk factors for childhood and adult obesity. She has published more than 75 articles in scientific journals, she is a reviewer in more than 15 journals and a member of the editorial board of 3 scientific journals. She has also participated as a principal investigator in many national and European studies like the FP7: ToyBox-study, the HORIZON 2020 Feel4Diabetes-study and the HORIZON 2020 GATEKEEPER study.

Christina N. Katsagoni

Clinical dietitian at Agia Sofia Children's Hospital in Greece, working in the clinical setting for more than 10 years.

She holds a PhD in Clinical Nutrition from Harokopio University of Athens, for which she was awarded a scholarship of excellence by the Greek State Scholarship Foundation. She has received further training from Rutgers University in the United States and Birmingham Children's Hospital in the United Kingdom.

She has a strong research background focused in gastroenterology and hepatology with a significant number of publications. Currently, she is the Lead of the gastroenterology group of the European Specialist Dietetic Network of EFAD.

Niki Katsiki

Specialist in Internal Medicine, Diabetes and Lipids and an elected Assistant Professor in the International Hellenic University. Her PhD was based on obesity-related peptides in patients with type 2 diabetes. She has participated in obesity, lipid, diabetes, and peripheral artery disease outpatient clinics, as well as Phase III randomized clinical trials with PCSK9 inhibitors. Dr Katsiki has given talks and lectures in several international conferences (in Greece, UK, Austria, Serbia, Italy, Cyprus, Spain, Poland, Bulgaria, Romania and Turkey) and participated in Expert Panel meetings and guidelines publications. She has also been involved in teaching medical students, trainees as well as postgraduate students in different countries.

Dr Katsiki is an IASO/EASO SCOPE member, a Fellow of the Royal Society of Public Health, a member of the EASD Diabetes & Cardiovascular Disease Group, the International Lipid Expert Panel (ILEP) and the Executive Board of the Hellenic Atherosclerosis Society. She has contributed chapters in national and international medical books on cardiovascular disease and diabetes. She also serves as a reviewer, Associate or Section Editor in international scientific medical journals. Dr Katsiki has 400 papers published in PubMed and 6,622 citations on the ISI, Core Collection (H-index = 43).

Despina Komninou

Physician specialized in Nutrition (American Board-Certified Nutrition Specialist) and an Adjunct Professor in the Department of Nutritional Sciences and Dietetics at the International Hellenic University. She received a degree in Medicine from the Aristotle University of Thessaloniki, a Master's Degree in Nutrition Science, and a PhD in Basic Pathology from New York Medical College in USA. Her post-doctorate studies in nutritional carcinogenesis, insulin resistance, aging and oxidative stress were conducted at

the Institute for Cancer Prevention in New York (American Health Foundation). She also served on the Data Safety Monitoring Board for the Clinical Nutrition Research Unit (CNRU) at Cornell/Rockefeller Universities and Strang Cancer Prevention Center in New York. Her scientific interests focus on the prevention and treatment of metabolic syndrome, obesity, diabetes and related diseases, as well as the interactions between nutritional, environmental, genetic and epigenetic factors that regulate glucose, insulin, metabolism, inflammation and oxidative stress. Her publications in international scientific journals have received over 1000 references (h-index 17). During the last several years, she has focused on the development of useful multi-omics markers to detect subclinical dysmetabolism in order to design effective protocols for precision medicine, nutrition and exercise.

Ioanna Kontele

Ioanna Kontele is a Dietitian-Nutritionist, a graduate of the Department of Dietetics and Nutrition Science at the Harokopio University of Athens and a member of the Association of Dietitians and Nutritionists in Greece. She holds an MSc in Public Health from the Department of Public Health Policy, School of Public Health, University of West Attica. Since 2007 she has been working as a Nutritionist at the Department of Non-Communicable Diseases and Nutrition at the Directorate of Public Health of the Greek Ministry of Health. She is a member of the National Nutrition Policy Committee. Between 2006 and 2011 she had worked as an external partner of the Adolescent Health Unit of the 2nd Pediatric Clinic at the University of Athens (Children's Hospital "P. & A. Kiriakou"), providing nutritional support to adolescents with eating disorders. She is a former international athlete of Artistic Gymnastics and Trampoline.

Athanasia Kotrotsou

Present Position

- Intensivist, Athens-Greece (since November 2020)
- Medical Doctor, specialist in Cardiology, Athens-Greece, (since March 2013)

Education

- Doctor of Medicine (MD), Faculty of Medicine, University of Crete (2002)

Licenses and Certification

26/08/2002: Greek Medical Board License

Member of Professional Organizations

8/2004 -to date: Member of Medical Association of Athens

Professional Development / Experience

- 2020 -to date: Specialist in Intensive Care Medicine, General Hospital of Athens, "Korgialeneio – Benakeio", Hellenic Red Cross Hospital.
- 2018 -to 2020: Training in Intensive Care Medicine, General Hospital of Athens, "Korgialeneio – Benakeio", Hellenic Red Cross Hospital.
- 2014-to 2018: "Ygeias Melathron", General Clinic of Athens, Diagnostic and Therapeutic Center for the personnel of National Bank of Greece, Cardiologist.
- 2013-to 2018: "Euroclinic", General Clinic of Athens, Cardiologist
- 2015-2016: Department of cardiovascular imaging, 1st Cardiology Department, General Hospital of Nikea, Piraeus.
- 2014-2015: Scientific Associate, Reference Center of Thalassemia and Sickle Cell Disease, "Laiko" General Hospital, Athens
- 2013-2014: Cardiologist on Duty, Intensive Care Unit (ICU), "Medical Center of Athens", Maroussi-Athens
- 2008-2012: Resident Doctor in Cardiology, "Laiko" General Hospital of Athens-Greece
- 2006-2008: Resident Doctor in Internal Medicine, "Agiou

- Anargyroi" General Oncology Hospital, Kifissia-Greece
- 2002-2004: Compulsory Rural Service, at Preveza General Hospital and at Filipiada Health Center, Ipeiros-Greece.

Clinical Trials

GCP Certificated, Sub investigator in several Phase II and Phase III Clinical Trials.

Conferences / Seminars

- Attended several seminars, on Cardiology and ICU interest.

Scientific Presentations /Abstracts / Publications

- Available upon request

Languages

- English (Certificate of Proficiency in English, University of Cambridge)

Computer Skills

- Windows XP/Office 2002/Internet Explorer/Outlook Express

Community Service / Medical Volunteer Experience

- Participate in public events for prevention of cardiovascular disease, organized by the Hellenic Institution of Cardiology.
- Educational lectures to primary school students about healthy diet, organized by the Hellenic Institution of Cardiology.
- Member of Hellenic Red Cross, Regional Department of Petroupolis, Athens, participating in scientific and public events.

Lemonica Koumbi

PROFESSIONAL EXPERIENCE

Honorary Post-Doctoral Research Fellow; Department of Nutritional Sciences and Dietetics, International Hellenic University (IHU), Thessaloniki, Greece; Jan 2019 – present.

Scientific Translator/Teacher POLIEDRA SPA; Consulting Company, Turin, Italy; June 2015 – present

Post-Doctoral Research Fellow; Imperial College, Hepatology and Gastroenterology Section, St. Mary's Campus, London, UK; Nov 2010 – Aug 2014

Research Assistant, Medical University of Athens, Second Department of Pediatrics, Allergy Research Center, Athens, Greece; Oct 2007 – Sep 2010

Research Assistant; Democritus University of Thrace, Alexandroupolis, Greece; Jan 2003 – Aug 2003

EDUCATION

PhD, Virology; Medical University of Athens, Second Department of Pediatrics, Allergy Research Center, Athens, Greece; Sep 2005 – Sep 2010

MSc, Human Molecular Genetics; Imperial College, London, UK; Sept 2001 – Sept 2002

BSc Hons, Cell And Molecular Biology; Oxford Brookes University, Oxford, UK; Sept 1997 – Sept 2000

ACADEMIC ACHIEVEMENTS

Sheila Sherlock Short-term Training Fellowship; European Association for the Study of the Liver (EASL); Aug 2013

Travel Fellowship; European Association for the Study of the Liver (EASL); April 2013

Short-Term Fellowship; European Molecular Biology Organization (EMBO); Sep 2012

Sheila Sherlock Post-Doctoral Fellowship; European Association for the Study of the Liver (EASL) April 2011-April 2013

Poster-section award; XXVII Congress of the European Academy of Allergology and Clinical Immunology, Barcelona, Spain; Oct 2008

Poster-section award; Third International Congress of Gastrointestinal Oncology, Crete, Greece; Mar 2007

Young Investigators Award; European Society of Clinical Microbiology and Infectious Diseases (ESCMID); Feb 2005

Small Grant Award Scheme; European Society for Paediatric

Infectious Diseases (ESPID); June 2005
 Travel training fellowship award; European Society for Paediatric Infectious Diseases (ESPID); Sep 2005
 Teaching
 POLIEDRA SPA, Turin, Italy; Jan 2015 – present
 Medical University of Athens; Sep 2000 – Sep 2010
 Imperial College, London, UK; Nov 2010 – Aug 2014
 Laboratory
 Expertise in molecular and immunological methods, including cloning strategies, nucleic hybridization assays, epigenetics, cell and primary cell culture, flow cytometry, functional, cytotoxicity and antigen presentation assays, virus propagation and infection.
 Computer literacy in flow cytometry analysis programs, sequencing and statistical programs.
 Editing
 Independent reviewer for high quality scientific journals
 Reviewed editor: *Frontiers in Microbiology* (2012-present), *World Journal of Hepatology* (2014-2021), *EC Gastroenterology and Digestive System* (2018-present).
 Languages
 Greek (native), English (fluent), Italian (advanced)

Yiannis Koutedakis

Professor Emeritus in applied physiology (Thessaly University, Greece), a Visiting Professor at Wolverhampton University (UK), Founding Director of the Research Institute in Human Performance & Rehabilitation (Trikala, Greece) and Chairman of the National Centre “Exercise is Medicine-Greece”. His research focuses on physical fitness and health in healthy and clinical populations. Parts of this work have been adopted by reputable agencies, such as the Scottish NHS, the British Heart Foundation, the South African Thoracic Society, the US Surgeon’s General Report, and the European League Against Rheumatism.

Nikolaos Koutlianos

Dr. Nikolaos Koutlianos is an Associate Professor of Athletes’ Physical Health Evaluation in the School of Physical Education and Sports Science in Aristotle University of Thessaloniki and member of the Sports Medicine Laboratory of the same Faculty. He is MD with bachelor in Physical Education & Sports Science. His research interests are pre-participation screening of athletes, prevention of sudden cardiac death in athletes, anti-doping, ergogenic aids, clinical exercise physiology, sports pathology, exercise-induced adaptations of cardiovascular, respiratory and autonomic nervous system. He has participated in EU-projects about the biomedical side effects of doping and information campaigns against doping in sports. He is teaching courses about nutritional supplements and ergogenic aids in two postgraduate programs. He was member of the Organizing Committee of more than 20 national and international congresses on sports medicine and sports sciences. Assoc. Prof. N. Koutlianos has successfully supervised to completion more than 45 research masters or PhD students, 18 of them as Principal Supervisor. He is co-author in three Sports Medicine books and he has published more than 70 scientific papers. He is member of many Greek and international sports medicine or sports-related associations and he is the chairman of Hellenic College of Sports Medicine.

Maria Lithoxopoulou

EDUCATION

Degree (ptychio) in Medicine, Hellenic Republic, Aristotle University of Thessaloniki, Faculty of Medicine, Greece
 Degree (ptychio) in Occupational Therapy, University of

Athens, Greece.

Licence to practice Medicine, Registration number G1/43564 Hellenic Republic, Region of Thessaloniki, Greece.

Licence to practice the qualification of Medical Specialty: “Paediatrics” Registration Number: G2/14075 Hellenic Republic, Region of Central Macedonia, Prefectural Authority of Thessaloniki, Greece.

PhD in “Study of Signal Transducer and Activator of Transcription in Neonatal Infection”, Aristotle University of Thessaloniki, Greece.

Master DIPLOMA in Business Administration (MBA) (in Administrative Unit of Health)

POSTGRADUATE QUALIFICATIONS EXPERIENCE:

I was waiting for the Specialty Training post for three months Clinical Rotation in the Departments of Internal Medicine, Cardiology and General Surgery at General Hospital of .Skydra -Edessa, Greece.

Specialty Training post for three months Clinical Rotation in the Departments of Internal Medicine, Cardiology and General Surgery at General Hospital of .Skydra -Edessa, Greece.

Compulsory Service as a Rural General Practitioner in Health Centre of .Skydra -Edessa, Greece.

Specialty Training post in the Department of Paediatrics at General Hospital of Infectious Diseases, “Limodon”, Thessaloniki, Greece.

Scientific Associate in the Department of Neonatal at General University Hospital of Ippokrateion, Thessaloniki, Greece.

Specialty Training post in the Department of Paediatrics at General University Hospital of “Ippokrateion”, Thessaloniki, Greece.

Preparation for specialty exams and title of Licence to practice the qualification of Medical Specialty in “Paediatrics”, Greece.

Scientific Associate in the Department of Neonatal at General University Hospital of Ippokrateion, Thessaloniki, Greece.

Specialty Training post in the Department of Neonatal at General University Hospital of Ippokrateion, Thessaloniki, Greece.

Specialty of Neonatology (after exams) and title of Medical Specialty in “Neonatology”.

Consultant Neonatologist in the Department of Neonatal Unit at General Hospital of G. Papageorgiou, Aristotle University of Thessaloniki, Greece.

Faidon Magkos

Faidon Magkos is Associate Professor in Obesity and Energy Balance at the Department of Nutrition, Exercise and Sports, University of Copenhagen, Denmark; and an Honorary Associate Professor at the Division of Medicine, University College London, United Kingdom. Prior to these appointments, he has served as Assistant Professor in Medicine at the Center for Human Nutrition, Washington University School of Medicine in St. Louis, Missouri, and Assistant Professor in Physiology at the Clinical Nutrition Research Centre, National University of Singapore. He has a Bachelor degree in Human Nutrition and Dietetics, a Master’s degree in Nutrition and Exercise, and a PhD in Human Metabolism. He has completed postdoc appointments at Harokopio University of Athens, Greece, and Harvard Medical School in Boston, Massachusetts. He has published 179 peer-reviewed papers and his work has been cited >8700 times. His h-index is 46 and field-weighted citation index is 4.7. The main area of his research expertise revolves around the effects of diet and exercise on body weight homeostasis and metabolic function, the cardiometabolic complications of excess fat accumulation, and how these can be rectified by weight loss.

Melania Manco

PHD in Nutrition and metabolism, is consultant endocrinologist and senior scientist at the Bambino Gesù Children's Hospital in Rome, Italy. She has several year clinical and research experience in the field of child's obesity, nutrition, insulin resistance and type 2 diabetes; and has published >250 scientific papers in peer-reviewed journals.

The driving hypothesis of her research activity is that innate immunity system and insulin resistance are ancestral defensive mechanisms against stressors (i.e. nutrients) which lead to the condition of low-grade inflammation, which characterises obesity and associated morbidities.

In 2014 Dr Manco qualified as full professor of Pediatrics and in 2019 of Endocrinology. She is member of the Food Additives and Flavorings Panel of the EFSA, of the scientific advisory board of the American Nutrition Association, and of the EASD-European Study group for the insulin resistance (EASD-EGIR) steering committee. She serves associate Editor of the JANA. She is coordinator of two medium-scale cohort studies granted by the Italian Ministry of Health. "The origin of cardiovascular risk in overweight preschool children" study investigates mechanisms leading to incident cardiovascular disease in pre-schoolers. The "Feeding fetus' low grade inflammation and insulin-resistance" explores the causative relationship between the maternal diet and the newborn's cardiometabolic asset, including epigenetic profiling.

Nikos V. Margaritelis

Nikos Margaritelis is an Assistant Professor of Research Methodology and Data Analysis in Physical Education and Sports at the Department of Physical Education and Sports Science at Serres, Aristotle University of Thessaloniki, Greece. His work focuses on the inter-individual differences in the responses of oxidative stress biomarkers after a stimulus and whether this redox heterogeneity translates to differential physiological adaptations after exercise. His research interests include also: (i) the impact of the statistical artifact "regression to the mean" in the exercise literature, (ii) the utilization of antioxidants and other redox nutraceuticals as ergogenics and therapeutics, (iii) the translational potential of redox biomarkers in health and disease, (iv) the application of mathematical modeling and simulation in exercise biology and (v) the implementation of novel methodological approaches in exercise studies. Dr Margaritelis has published more than 35 articles in the fields of redox biology, physiology, exercise and nutrition. He serves as a Reviewer in more than 20 peer-reviewed journals and is member of the Editorial Board as well as Topic Editor in several journals from the above fields.

Eliza Markidou

Senior Clinical Dietitian and Nutrition Coordinator for the Ministry of Health. Mrs Markidou graduated from the American University of Beirut with Aa BSc Biology and continued with her graduate studies in New York University for the MSc in Clinical Dietetics. She is a PhD candidate specializing in childhood Obesity. She works for the Ministry of Health and she is the Focal point for Nutrition and Exercise in the European Union and represents Cyprus in the World Health Organization in the area of Food, Nutrition and Exercise. She has delivered presentation worldwide in the area of Nutrition, Mediterranean Diet and wellness. She is the Primary Investigator for COSI WHO. She is active in a number of NGO dealing with Nutrition and exercise, childhood obesity and women business associations. She is a TV presenter. Mrs Markidou is a professor at the Limassol Collage and Visiting professor at the University of Calabria. She is the president of the Quality of life Committee and she has run for the

parliament elections 2016. She is in the board of the AUB and in the Board of the PBW association for Women. She is married and has three children, a medical Doctor, a lawyer and student in medicine.

Anthia Matsakidou

Dr. Anthia Matsakidou is a Chemical Engineer (Int.Master), holding a M.Sc. in Food Chemistry and Technology. Her doctorate research focused on the extraction of oil bodies from maize germ and their incorporation into food systems. She has participated in several research projects in the Food Science field and has earned a grant as a Postdoctoral Researcher/Principal Investigator in one of them. Her research interests lie in the field of physico-chemical properties of food systems, protein techno-functional properties (emulsifying, gelling, film-forming, foaming properties) and the characterization of food dispersion systems. She has a long-term experience in the study of both conventional and alternative protein and lipid sources, such as meat, seeds, legumes, olives, sperms, milk, edible snails and insects and has exploited them in developing bakery and dairy products, edible films and instant powders. She has co-authored fifteen original and review research papers in journals of high impact and co-owns a patent. Her research has been presented in several national and international conferences of the field.

Alessandra Mazzocchi

EDUCATION AND TRAINING

2016: PhD in "Experimental and Clinical Nutrition", Graduate School of Biochemical, Nutritional and Metabolic Sciences, XXVIII cycle, University of Milano, Italy

2012: Master Degree in "Human Nutrition and Food Science", University of Milano, Italy

2008: Undergraduate degrees in "Biological Sciences", University of Torino, Italy

CURRENT POSITION

Fixed-term Research Fellow A, Department of Clinical Sciences and Community Health, University of Milano, Italy.

ORIGINAL RESEARCH PROJECTS

Studies related to the nutritional status (energy expenditure, fatty acid profile, nutritional habits, vitamin D status) in pediatric patients hospitalized for both acute and chronic diseases.

SCIENTIFIC REVIEWS FIELD

Nutritional aspects in pediatric age (both in healthy and ill children); role of docosahexaenoic acid in the development and maintenance of correct brain functions and protective effect against cognitive processes and the neuropathologies' onset; nutrition in the prevention and management of food allergies (study of the diet in the first years of life and the impact on health and correct growth of the different types of formulas used as an alternative to breast milk); role of diet and nutrients in the prevention of non-communicable diseases; Mediterranean diet; sustainable diet.

ACTIVITIES IN THE CLINICAL FIELD

From 05/2018 nutritional consultancy at the Pediatric Clinical Nutrition Outpatient Clinic, IRCCS Ca 'Granda Foundation Ospedale Maggiore Policlinico.

Elena Mente

Professor of aquatic animal nutritional physiology at Aristotle University of Thessaloniki and Honorary Research Fellow at the University of Aberdeen, UK. She was awarded three competitive Fellowships, two European and one from the UK, aiming at research on aquatic animal nutrition and has more than 20th years' experience on research in sustainable aquaculture. She has coordinated/participated in several

research projects supported by national research programmes, the European Commission (4th to 7th FP, H2020) and the aquaculture industry, cooperating with more than thirty international research teams through national, bi-lateral and EU-funded projects. On-going research is related to organic aquaculture, nutrigenomic and individualising fish nutrition for maintenance of its optimal metabolism and efficient growth performance. She is Associate Editor in the Journal of Crustacean Biology and Aquaculture International. She has authored/co-authored/edited five books, more than 85 peer-reviewed papers, ten chapters in books and participated in 120 international and national conferences. She is a member of the sub-group for technical advice on organic production of the European Commission. She is elected European Governor of the Crustacean Society for 2011-2013, re-elected for 2013-2015. She was elected as a member of the Board of the European Aquaculture Society for 2012-2014, re-elected 2014-2018.

Methenitis Spyridon

Dr. Methenitis is an exercise physiologist, holding Bachelor and Master degrees in Sports Science and Physical Education from the Democritus University of Thrace, while he received his PhD from the School of Sports Science and Physical Education of National and Kapodistrian University of Athens. From 2016 until now is a post-doctoral fellow/researcher and teaching associate at (1) School of Sports Science and Physical Education, (2) Medical School of National and Kapodistrian University of Athens, (3) Department of Nutrition and Dietetics, School of Health Sciences & Education, Harokopio University and (4) Department of Nutrition Sciences and Dietology, Faculty of Health Sciences, International Hellenic University. His research focused on the role of muscle and especially of muscle fiber morphology/metabolism on human body performance, metabolism and health, as well as how systematic training, in combination or not with nutrition, regulates the morphological and metabolic adaptations of muscles and muscle fibers, and how these adaptations control the training/nutritional induced changes in human body performance, metabolism and health. Until now he has published more than 45 original and review articles in high-impact factor journals and has received several grand awards for his research.

Manuel Moñino

Bachelor of Science in Human Nutrition and Dietetics. Postgraduate Human Nutrition, and Communication of Health Sciences.

Lead of the European Specialist Dietetic Network in Public Health of the European Federation of Dietetic Associations (EFAD). Researcher in the Biomedical Research Centre Network on Pathophysiology of Obesity and Nutrition and the Institute of Sanitary Research of Balearic Islands in the Area of Cardiovascular and Nutritional Epidemiology working in the PREDIMED & PREDIMED PLUS studies. Senior consultant in public health for the Spanish Association "5 a day", the Global Alliance for the Promotion of F&V Consumption AIAM5 and the Spanish Academy of Nutrition and Dietetics. CEO Professional Body Dietitians-Nutritionists Balearic Islands; Author of 20 papers in indexes journals (WOS), 11 book chapters and 66 communications in international and national congresses. Observer member of the International Steering Committee of the International Year of Fruit and Vegetables 2021.

Theodora Mouratidou

Associate Professor in Community Nutrition at the Department of Nutrition and Dietetics, Hellenic Mediterranean University

in Crete, Greece. She has more than 18 years of experience delivering research, policy support and consultancy in the fields of nutrition and dietetics, obesity, public health, policy development and NCDs prevention under the framework of data management, monitoring and evaluation, capacity building and knowledge management. She has worked for the University of Sheffield, the University of Zaragoza and the European Commission and has advised several UN agencies (WHO, FAO, IOM and IAEA). Over the years, she has investigated the relationship between nutrition, obesity and NCDs, supported the EU legislative policy development on trans fatty acids, supported the EU Action Plan on Childhood Obesity 2014 - 2020, worked on capacity building for the integration of nutrition indicators into budget and health surveys, and focused on knowledge management.

Nicoletta Ntorzi

PhD candidate from Nicosia University. She studied at New York University getting a Bachelor of Nutrition and Food Studies with concentration in Dietetics. Once graduating from her Bachelor degree in 2004, she furthered her studies and completed a Masters in MS Clinical Nutrition, this covering relevant topics such as medical nutrition therapy, nutrition counseling, and clinical nutrition assessment. Also, in 2005 she was granted a position to start a Dietetic Internship in affiliation with St. Vincent's Hospital at Staten Island New York.

At present date, Nicoletta's accreditations and licenses include the following; Reregistered Dietician (RD), Certified Dietician Nutritionist (CDN), Certification of training in children and adolescent weight management, Certification of training in adult weight management and Licensed Clinical Dietician in Cyprus Dietetic Association.

From 2007, Nicoletta started her own private practice in Nicosia Cyprus, specialized on medical conditions such as obesity (childhood and adult), gastrointestinal conditions, cardiovascular conditions, diabetes (type 1, type 2, gestational), kidney failure etc. With each one of her clients, assessments are performed and individual diets are prescribed given their condition with special focus on any medical/ weight management issues. Once their goal is known, everything is done to achieve that goal for her clients. Also, giving them that confidence and building up a strong rapport with them that's long lasting, so they are able to seek advice at any time needed. Nicoletta writes frequently on various websites about food and nutrition. Also analyzing and discussing recipes from popular chefs such and letting individuals know what a healthier option can be and how a recipe can slightly be changed and still have its full flavor.

In February 2012, Nicoletta published her first book «Από το Ράφι στο Καρότσι», a guide how to shop smart in the supermarket, what to read on the food labels, which ingredients to avoid and how to store food properly. In June 2015, Nicoletta published her second book "Nutricef" or "Διατροσέφ" which is available both in Greek and English. Nutricef is a Gourmant Awarded book that has nutritional guidelines for the whole family and healthy and delicious recipes. Every recipe has its nutritional analysis.

In conclusion, Nicoletta is at the board of the Cyprus Dietetic and Nutrition Association (CyDNA) since 2013 as an Assistant Secretary, member of the American Dietetic Association (ADA) and a member of the American Overseas Dietetic Association (AODA).

Nikolaos Papadopoulos

Professor and Head, Pediatric Allergy Department, University of Athens, Athens, Greece

Nikolaos (Nikos) Papadopoulos is a world leading expert in allergy and asthma, focusing on the role of infection and its interaction with atopy, as keystone events of allergy pathophysiology as well as targets for treatment. In the course of this career, he has identified some of the key mechanisms leading from common viral exposures to asthma exacerbations and persistence.

He is Professor and Head of the Allergy Department, 2nd Pediatric Clinic, University of Athens; also Honorary Professor at the University of Manchester and at OPRI, Singapore.

He has supervised more than 20 PhDs, organized over 100 educational events and has trained doctors in the clinic and researchers in the lab. He is invited speaker at international events more than 30 times a year.

He has participated and led several high-impact EU research projects from FP5 all the way to Horizon Europe (2022). He has actively served many international societies, most notably EAACI (President 2013-2015) and the Respiratory Effectiveness Group (REG, President 2018-2020).

He has received several international awards, among other, the EAACI Clemens von Pirquet Award (2019), the PhARF award (2010), the Klosterfrau International Award (2003) and the ERS Annual Award for Pediatric Respiratory Research in Europe (2004). He has published over 500 papers, receiving more than 45000 citations and an h-index of 97 (Google Scholar).

He is Editor-in-Chief of *Frontiers in Allergy and Associate Editor of Clinical & Translational Allergy*.

Currently he is exploring the role of the respiratory virome in asthma, trialling new interventions in milk and nut allergy, evaluating potential interventions against indoor air pollution at schools, while he is leading PeARL (Pediatric Asthma in Real-Life), a think tank that aims to optimise pediatric asthma management.

Anna Papageorgiou

PhD Nutritionist & Clinical Dietitian, Physical Instructor & Sports Science Areas of Specialization, Sports nutrition, childhood obesity, Sports Science, public health promotion policies Researcher grade C, University Research Institute of Maternal And Child Health & Precision Medicine.

Dr Anna Papageorgiou graduated from Harokopio University and Kapodistrian University of Athens. Anna has also worked as a Project Leader in designing nutrition services at the Athens 2004 Olympic and Paralympic Games. She was the Olympic Stadium's Nutritional Director, designing the athlete's programme of nutritional support, but also the official Nutrition menu of the opening and closing ceremonies. More specifically her expertise to:

A. The Childhood Obesity Clinic Agia Sophia pediatrics clinic from 2003-2007

- organizing and operating the Clinic
- researching the factors responsible for obesity as part of her PHD (University of Athens Department Of Medicine)
- planning, implementing and evaluating Health Intervention and Promotion Programmes (organization and operation of educational summer camps focusing on exercise and weight management)
- planning and implementing exercise, nutrition, change of lifestyle, health prevention and promotion programs in the Primary, Secondary and Tertiary healthcare of obese children/adolescent
- informing, educating and promoting health issues aimed at parents and educators in the area of Athens
- participating in educational programs to inform the public about issues concerning Childhood Obesity

B. Adolescent Clinic

- Organizing and operating the Nutrition and Exercise Department
- planning and implementing nutrition and exercise intervention programmes as well as programmes promoting a healthy lifestyle
- educating adolescents about health-related quality of life issues

Dr. Papalazarou

Dietitian since 1996 and has his own private, clinical practice in Athens, Greece. He specializes in weight management and his approach to weight control focuses on cognitive behavioural modification techniques as opposed to a model of following a strict diet. Being Greek, he believes in the great value of the Mediterranean diet/lifestyle, values of which he tries to pass on to his clients as well. He is a spokesperson for brands that are aligned with his nutrition philosophy. He frequently makes guest appearances on TV and radio and writes articles for print and web media. He also has a strong academic background holding two MSc and a PhD degrees in nutrition. He has been a scientific associate of the Harokopio University of Athens since 2011.

Maria Perperidi

Graduated from the department of Nutrition and Dietetics and completed her postgraduate studies in Applied Nutrition and Dietetics with discipline in Nutrition and Exercise, both at Harokopio University in Athens. Currently, she is conducting her doctoral dissertation with the title "Design, implementation and evaluation of a behavioural intervention to treat obesity in breast cancer survivors". She collaborates with her supervisor Assistant Professor Dr. Odysseas Androutsos at the Lab of Nutrition and Clinical Dietetics (CND-lab) in the department of Nutrition and Dietetics, School of Physical Education, Sport Science and Dietetics, University of Thessaly.

Elena Philippou

PhD, RD, FHEA is an Associate Professor in Nutrition-Dietetics at the University of Nicosia and a Visiting Lecturer in Nutritional Sciences at King's College London, UK. Dr Philippou's research focuses on diet for prevention of degenerative disease, and more specifically, the effects of the Mediterranean diet and carbohydrate manipulation on cognitive function, cardiometabolic factors and rheumatic disease, aiming to identify dietary factors that can prevent disease and/or improve outcomes. She has published a number of papers in peer-reviewed journals and is the Editor of the book 'Glycemic Index: Applications in Practice' (CRC Press).

She teaches a number of courses both at the BSc Nutrition-Dietetics course and the MSc Dietetics course, including Public Health Nutrition, Nutritional Assessment, Medical Nutrition Therapy, Contemporary Issues in Nutrition. She is the course leader of the Public Health Nutrition course of the MSc on Public Health at the University of Nicosia (UNIC) Medical School and teaches at UNIC's Medical School.

She has a number of National and International collaborations including being an active member of the American Congress of Rehabilitation Medicine Neurodegenerative Diseases Networking Group. Dr Philippou also has extensive experience as a registered dietitian and practices advising adults and children on diet-related issues.

Anastassios Philippou

Associate Professor of Physiology-Exercise Physiology at the Medical School of the National and Kapodistrian University

of Athens, Greece. He is a graduate of Exercise Science and Physical Therapy with postgraduate, doctoral, and postdoctoral studies in the Biology and Physiology of Exercise and Skeletal Muscle. He has more than 100 publications in international scientific journals (citations: more than 3,200; h-index: 29) and has been involved in the translation and scientific editing of books as well as the writing of (Greek and English) book chapters. He is a Fellow of the American College of Sports Medicine, Founding Member of the Greek National Center "Exercise Is Medicine - Greece" and of the "Institute of Applied Physiology & Exercise in Medicine", and member of 8 scientific societies. His scientific work covers a wide field in the Physiology of Exercise and in particular the skeletal muscle, for which he has received international and national awards. As part of his postdoctoral studies (UPENN, USA) and cooperation / funding from NASA, he participated in the study of the muscle atrophy of experimental animals in the space mission of NASA, STS-135.

Constantinos Pitsios

MD, PhD, did his specialty in Allergology and Clinical Immunology, after which he received his PhD degree (2008) in Immunology at the University of Athens, Greece. Most of his research has focused on allergen immunotherapy. He is currently teaching Physiology, Pathophysiology and Immunology at the Medical School, University of Cyprus and as an Allergy specialist at the Nicosia General Hospital.

Kalliopi-Anna (Liana) Poulia,

Kalliopi Anna Poulia is an Assistant Professor of Clinical Dietetics in the Department of Food Science and Human Nutrition in the Agricultural University of Athens. She has worked as a Clinical Dietitian-Nutritionist in the General Hospital of Athens "Laiko" from 2003 until 2021, with a special interest in

- nutrition in renal disease,
- nutrition in geriatrics
- cancer and neuro-endocrine tumors
- malnutrition and
- artificial nutrition, both enteral and parenteral.

She graduated from the Department of Science of Nutrition and Dietetics in Harokopio University of Athens and she attended the postgraduate programme leading to a Master of Science (Medical Science), with specialization in Clinical Nutrition in Glasgow University. In 2012 she fulfilled her PhD in Agricultural University of Athens, on the field of Hospital Infections and Malnutrition in the elderly.

From 2002 until 2004 she was elected President of the Hellenic Dietetic Association and from 2003 until 2006 she was representing the Hellenic Dietetic Association to the European Federation of Associations for Dietitians (EFAD). In 2010 she was re-elected vice-president of the Hellenic Dietetic Association, where she served until 2019. Since 2010 she is the Nutrition Consultant of the European Dialysis and Transplant Nurses Association/European Renal Care Association (EDTNA/ERCA).

She is vice president of the Hellenic Medical Society of Clinical Nutrition and Metabolism (GrESPEN) and since 2021 she is a TLLL instructor for ESPEN. From 2014 until 2018 she served as the dietitian member of the Educational and Clinical Practice Committee of ESPEN. She has contributed in several medical books regarding clinical nutrition in English and in Greek and she has participated in numerous local and international congresses as a guest speaker.

Nikolai Pushkarev

Senior Policy Manager for healthy environments and Policy

Coordinator at the European Public Health Alliance (EPHA), a leading civil society network working to improve health and strengthen the voice of public health in Europe. As senior policy manager Nikolai leads EPHA's activities on food systems and non-communicable diseases (NCDs) prevention, promoting policies to tackle the common risk factors for NCDs, and to advance a transition towards sustainable food systems with health-enabling food environments. As policy coordinator he contributes to the strategic alignment of EPHA's policy activities for enhanced impact.

Previous experiences include human rights, environment, energy, as well as work in the cultural and private sectors. He gained an MA in European Law from Maastricht University and a postgraduate degree in agricultural economics through the School of Oriental and African Studies, University of London.

Grigoris Risvas

Public Health Dietitian, who has graduated from the Department of Dietetics-Nutrition Science of Harokopio University in Athens, Greece. He holds a Master's Degree in Medical Science from the University of Glasgow in Human Nutrition with specialisation in Public Health Nutrition and a second Master's from the Department of Nursing of the University of Athens, in Health Services Management. Finally, he has a PhD in Applied Dietetics-Nutrition from Harokopio University.

He has worked at the Department of Dietetics-Nutrition Science, at Harokopio University and at the Department of Food Science and Human Nutrition of the Agricultural University of Athens, as a lecturer, internship coordinator and researcher, as well as in private colleges and lifelong learning centers, up to the position of Academic Director. Since 2019 he has been working as a Programme Director in the Dietetics Department of Aegean College.

He has participated in the editorial team of four academic books, as well as a Health Promotion Guide for Primary School Students. He also has 17 publications with 410 citations. He has participated as a speaker, chair and member of the organizing and scientific committee in Panhellenic and International Conferences.

He has been the General Manager of nutrimed since its foundation in 2006. He was President of the Hellenic Dietetic Association from 2010 to 2016, member of the National Nutrition Policy Committee of the Ministry of Health in Greece until 2014, and he is currently Vice-President of the European Federation of the Associations of Dietitians (EFAD).

Ana Isabel Rito

Researcher at the National Institute of Health Dr. Ricardo Jorge (NIH), Portugal co-leading the WHO/Europe Collaborating Center for Nutrition and Childhood Obesity. She has a PhD in "Nutrition and Public Health" (FIOCRUZ/Brazil & Univ Nova de Lisboa, PT 2004), a Master Degree in "Medical Sciences - Human Nutrition" (University of Sheffield/UK, 1996) and a Bachelor degree in "Nutritional Sciences" at (Univ. Porto, Portugal, 1991). She also attended other courses such as "Methods and Application in Health Services Research" at Harvard School of Public Health (USA, 2008). Ana Rito has been since 2007, the Principal Investigator for Portugal of the "Childhood Obesity Surveillance Initiative - WHO/Europe" (COSI), a member of its Advisory Board and a Consultant for WHO. Additionally she is the Director of CEIDSS.com, where she has developed and coordinated several (7+) Community Based Programs on tackling childhood obesity, at National level, such as the Program MUN-SI (www.mun-si.com) and at European Level, the EU granted OPEN, the EEA Granted Eat Mediterranean and the EU H2020 - CO-Create. She was the Head of the Bachelor's

Degree in Nutrition Sciences (Univ. Atlantica 2005-2014) and has collaborated as a Professor in other Universities at national and international level. Beside the vast published literature, she has vast experience in European Networks such as the “European Network on Reducing marketing pressure on children” and has developed scientific/research collaboration with more than 29 international institutions.

Georgios Saltaouras

Academy Teaching Fellow at the International Hellenic University and the University of Thessaly. He is also an Associate Lecturer at Oxford Brookes University, UK. Georgios has a background in Nutrition and Dietetics, with a BSc in Dietetics & Nutritional Sciences, Harokopio University, Athens, Greece and a MSc in Nutrition & Metabolic Health, University of Aberdeen, UK. His PhD focussed on nutritional care and unmet needs in survivors of a pelvic cancer after radiotherapy. His research interests focus on the role of nutrition in cancer care, survivorship and Quality of Life outcomes. Georgios has presented his research work in several conferences, in the form of oral or poster presentations. He is an Academy Fellow of the World Cancer Research Fund (2019) and a member of the Hellenic Association of Dietitians & Nutritionists (2020).

Ioannis Sampsonidis

Post-doctoral researcher at the Department of Nutritional Sciences and Dietetics of the International Hellenic University. He studied Chemistry at the Aristotle University of Thessaloniki, where he developed a passion for Analytical Chemistry and Chromatography while working on his undergraduate thesis with Prof. Georgios Theodoridis. After his graduation in 2012, he further pursued the subject of Chemical Analysis during his Master's degree, where he developed novel approaches for method development in targeted Metabolomics. In late 2014, he started his PhD with Dr Caroline-Gauchotte Lindsay at the University of Glasgow, where he developed novel sample preparation methods for the holistic analysis of samples of environmental interest, and for the application of Metabolomics methodologies in the field of Environmental Analysis. After graduating, in 2019, he is working as a Post-doctoral Researcher in the FoodomicsGR research initiative, developing multiple methods for Metabolomics and Lipidomics analysis on multiple food matrices. During this time, he developed a keen interest in the challenging field of Lipidomics and is actively working on mapping the lipidome of Greek dairy products to further our understanding of their nutritional value.

Labros S. Sidossis

PhD, FTOS, FAHA, FNAK is a Distinguished Professor at the Department of Kinesiology and Health and the Department of Medicine at Rutgers University, New Jersey, USA and President of the Mediterranean Lifestyle Medicine Institute. He holds a BS in Exercise Sciences, an MS in Exercise Physiology, MA in Exercise Biochemistry and Nutrition, and a PhD in Nutrition - Metabolic Biochemistry from the University of Texas Medical Branch at Galveston, TX USA.

Dr. Sidossis' research over the past 30 years has focused on the role of lifestyle factors (nutrition and exercise) in the prevention and treatment of major cardiometabolic diseases, including obesity, insulin resistance and dyslipidemias. His studies have been funded by the National Institutes of Health (USA), the American Diabetes Association, the Shriners Hospitals for Children, the European Union, and the industry. His 200+ papers in peer-reviewed journals have been cited > 15000 times; h-index: 61.

Soulis George

MD, PhD, BSc, is a Family Physician and Geriatrician. He also studied Biology and Neurosciences. He is working as a consultant Geriatrician at the Outpatient Geriatric Assessment Unit of Henry Dunant Hospital Center. He is very actively implicated in teaching Geriatric Medicine at both undergraduate and postgraduate students. He is vice President of the Hellenic Society for the Study and Research of Ageing and President of the Hellenic Society of Frailty and Sarcopenia. His scientific interest concerns frailty, sarcopenia, community geriatrics and optimization of ageing processes.

Ioanna Tatouli

Graduated from the School of Medicine (University of Athens) in 2010. She completed the Internal Medicine residency in the Department of Clinical Therapeutics, General Hospital of Athens “Alexandra” and she has been specialized on Intensive Care Medicine since August 2020. She is currently working as a registrar in the ICU of General Hospital of Athens “Korgialeneio-Benakeio”. In the 20-bed-ICU of “Korgialeneio-Benakeio”, critically ill adult with trauma, neurosurgical problems, surgical pathology, respiratory failure, shock, COVID-19 and other critical conditions are hospitalized.

Ioanna Tatouli holds a Master's degree in “Clinical ergospirometry, exercise and rehabilitation” and she is candidate for a second one in “Respiratory failure and mechanical ventilation”. Her clinical and research interests are post-intensive care syndrome, implementation of ABCDEF bundle in ICU, respiratory failure in neuromuscular diseases and management of immunosuppressive patients in ICU.

Georgios Theodoridis

Professor of Analytical Chemistry at the Department of Chemistry, AUn, Greece. He studied Chemistry (1990) and received his PhD (1994) in separations sciences from the Aristotle University. He then studied theoretical aspects of separation sciences at the Universities of Pardubice University (1994-1995) and chromatography of taxane drugs in Leiden University (1995-1997, 1999). He returned to AUn as a post-doctoral researcher, where he subsequently was employed as lecturer (2000), assistant professor (2004), associate professor (2011) and full professor (2015). His work experience includes a yearly (2006-2007) sabbatical leave to AstraZeneca (Cheshire, UK) on the development of metabolomic tools for biomarker discovery and a metabolomics group leader position at IASMA, Edmund Mach Foundation, Trento, Italy (2009-2010). His interests are on the development of LC-MS and GC-MS methodologies for metabolite profiling and bioanalysis. He leads the BIOMIC initiative of AUn. He has co-authored ca. 140 peer reviewed articles, 20 book chapters and made more than 150 presentations in international meetings. His works have attracted more than 6300 citations, and he has an h-index of 41. He serves as Editor of J. Chromatography B, and in the editorial board of Metabolites, Open Journal Biochemistry, J. Integrated Omics, and Separations.

Carina Venter

Dr. Venter is an Associate Professor of Pediatrics, Section of Allergy/Immunology at the Children's Hospital Colorado and University of Colorado Denver School of Medicine, where she is conducting research in allergy prevention and working with children with food allergies. She is the past chair of the International Network of Dietitians and Nutritionists in Allergy, and a member of the American Academy of Allergy and Clinical Immunology (AAAAI), American College of Allergy and Clinical Immunology (ACAAI), European Academy of Allergy and Clinical Immunology (EAACI) and the British

Society of Allergy and Clinical Immunology (BSACI). Dr. Venter is a senior advisor to Food Allergy Research and Education (FARE). She is a registered dietitian in the United Kingdom and United States. She has had publications in international journals, book chapters and edited a book on Food Hypersensitivity. She moved from the UK in 2015 where she had been performing research into allergy prevention and prevention. Dr. Venter works closely with Dr. Gupta and her team on the on the Start Eating Early Diet (SEED) study.

She was a member of the EAACI and AAAAI food allergy guidelines on Allergy Prevention and the EAACI guidelines on the Diagnosis and Management of Food Allergy guidelines, the NICE (UK) food allergy guidelines and the National Institutes for Allergy and Infectious Diseases Peanut Allergy Prevention Guidelines. Dr. Venter is currently the chair of the EAACI work group on Immunomodulation and nutrition.

Veskoukis Aristidis

Assistant Professor in Redox Biology of Nutrition and Exercise at the Department of Nutrition and Dietetics, University of Thessaly, Trikala, Greece. He has obtained his B.Sc. from the Department of Biochemistry and Biotechnology, University of Thessaly, Larissa, Greece and holds a Ph.D. in Exercise Biochemistry from the same Department. He worked as a Post-Doctoral Researcher at the Department of Physical Education and Sport Science at Serres, Aristotle University of Thessaloniki and at the Department of Biochemistry and Biotechnology, University of Thessaly, Larissa, Greece. His research focuses on the effects of nutrition, exercise, and xenobiotics (putatively toxic compounds) on antioxidant profile in vivo (i.e., humans and animals) and in vitro. Furthermore, he is interested in the role of exercise and nutritional interventions on craving reduction and sustainable rehab of opioid-addicted patients under medication-assisted treatment with buprenorphine and methadone. He has co-authored > 65 publications in peer-reviewed journals, 5 book chapters and 2 editorials (citations: 1856; h index: 23; Source: Google Scholar). He is a member of the editorial board of 2 journals and an invited reviewer in > 40 journals.

Konstantinos Xenos

Born in Athens & graduated from Leeds Metropolitan University with a Bachelor of Science in the field of human nutrition and dietetics and possesses a Master of Science in clinical dietetics from the same University and another Master of Science in Nutritional Medicine from the University of Surrey.

He obtained his PhD degree in Pharmaceutical Sciences from the National and Kapodistrian University of Athens.

He is head of the nutrigenetics department of "Athens Euroclinic Hospital" and also he practises the profession of clinical dietitian and nutritionist, in his personal office for the last 28 years.

He is vice president of Hellenic Nutrition Institute.

He has participated as speaker or lecturer in a lot of congresses and international scientific events, while from 1996 until today he has attended all the world congresses on nutrition, clinical dietetics and obesity that have been carried out.

The last two decades he has presented many television programmes regarding health and nutrition, while he is editor of many magazines that deal with health, nutrition and diet.

Mary Yannakoulia

Professor of Nutrition and Eating Behavior in the Department of Nutrition and Dietetics, Harokopio University, Athens, Greece. Her research interests are related to factors that influence human eating behavior, weight loss maintenance, as

well as diet and aging/cognitive decline. In 2009 she received a Fulbright research award for studying the effect of the Mediterranean diet on metabolic markers at Beth Israel and Deaconess Medical Center, Harvard Medical School, Boston, US. She has been the PI in 6 research projects with national or international funding and in many others the co-PI or collaborator. She has co-authored 215 scientific publications in peer-reviewed journals (> 5,600 citations; h-factor 38). She was included in the 2021 top 2% of scientists worldwide in her area of expertise (Nutrition) based on study from Elsevier and Stanford University. Prof. Yannakoulia is the president of the National (Greek) Nutrition Policy Committee and, till 2021, she was the representative of Greece in the High Level Group on Nutrition and Physical Activity of the European Commission.

Hijran Yavuzcan

Professor at the Ankara University (AU), Faculty of Agriculture, Department of Fisheries and Aquaculture (DF&A) which is the pioneer scientific institute in Turkey. She has been working for this University more than 25 years. Her prior positions include Vice Dean of Faculty of Agriculture, Head of Department of DF&A and the Director of Aquaculture Research Center in AU. She has led a number of EU funded projects and also national projects on aquaculture. Established a well-equipped fish physiology and health lab in the DF&A. Highly experienced in research activity. She has publications in SCI index and national peer reviewed journals, and many contributions to international scientific symposiums in her scientific theme. Currently, she leads the responsible aquaculture research group. Well acquainted with sustainable aquaculture and fish health as well as bio-based production topics, mostly related to innovative approach in sustainable food production. Her recent focus has been on aquaponics (co-production of fish and vegetable) as a solution against climate change and water scarcity in relation to sustainable food production for the future. She is active in gaining a clear perception of sustainable aquaculture for sustainable seafood consumption.

Emmanouil Zacharakis

Member of the National Basketball Team 1978-1982. Basketball coach 1982-2017. Head coach of the National Wheelchair Basketball Team at the 2004 Athens Paralympics. Teacher of physical education in private (1986-1993) and public (1994-2000) schools. Holder of a PhD entitled "Wheelchair Basketball Players' Physical, Technical Abilities and Functional Response to Exercise." Associate professor since 2000 in the National and Kapodistrian University of Athens, School of Physical Education and Sport Science (SEFAA), course "Teaching and Coaching Basketball." Lecturer in the SEFAA postgraduate program "Physical Education and Sports." Lecturer in the postgraduate program "Exercise, Ergospirometry and Rehabilitation" of the University of Thessaly. Head of the course "Didactics of Paralympic Sports" since 2017. Member of the SEFAA internal evaluation team. Member of the team of study advisors. Member of the Ergophysiology Lab. Author and co-author of 17 articles published in international journals. Contributor to a printed book and an e-book. Supervisor in 10 and member of 5 three-member committees of postgraduate theses. Supervisor of two PhD students. Reviewer in two reputable international scientific journals. Scientific advisor of the Hellenic Wheelchair Basketball Federation.

Antonis Zampelas

Professor Antonis Zampelas is President of the Management Board of the Hellenic Food Authority, Professor in Human Nutrition in the Department of Food Science and Human

Nutrition, Agricultural University of Athens, Greece and Honorary Professor in the Division of Medical Sciences, University College London Greece.

He obtained his BSc in Food Science and Technology from the Agricultural University of Athens, Greece, his MSc degree in Food Science from the University of Reading, UK and his PhD in Human Nutrition from the University of Surrey, UK.

He worked as Research Fellow at the University of Surrey, Senior Scientific Officer at the Ministry of Agriculture, Fisheries and Food, UK, Assistant Professor at the Department of Food Science and Human Nutrition, Harokopio University, Athens, and Professor at the Nutrition and Health Department, UAEU. He has been involved in numerous trials and projects related to the effects of diet on parameters influencing the development of cardiovascular diseases. He is the Principal Investigator of the Hellenic Nutrition and Health Examination Survey and of the GRECO Study.

Professor Zampelas co-authored 20 text-book chapters and contributed to 185 peer reviewed publications in international scientific journals.

Evangelos Zoumbaneas

Nutritionist, Master Practitioner in Eating Disorders and Obesity General Director of the Greek Centre of Education & Treatment of Eating Disorders (www.keadd.gr)

Founder of the professional team Diatrofi – www.diatrofi.gr

Evangelos Zoumbaneas is a Clinical Nutritionist. He graduated in 1993 from the Department of Nutrition and Dietetics, at the Technological Institute of Thessaloniki, Greece. He has been working in private practice as Nutritionist in Greece since 1993. Since 2010, he is president of KEADD – Centre for Education & Treatment of Eating Disorders, through which, health professionals are trained in matters of disordered eating and obesity.

In December 2010, he became the General Director of the Centre of Education & Treatment of Eating Disorders (KEADD, www.keadd.gr), in Athens. The Centre of Education & Treatment of Eating Disorders is affiliated with the NCFED, of Great Britain.

During the period 2006-2007, he worked as a supervisor at the Department of Nutrition of Adolescent Health Unit of the children's hospital "Aglaia Kyriakou" in Athens. He has been an associate in this unit ever since.

He is the writer of the books "Nutritional Intelligence: The answer to bulimia, bingeing, and obesity" "Chef in 5 Minutes" "Thin Positive – Secrets to control Hunger & Appetite", Looking for the magical weight of your dreams, and many more.

Joanne Adamidou

BSc in Applied Biology from Kingston University in London, UK, and specialized in Immunology with a MSc from King's College, University of London. Following her considerable experience working with many obese patients at the Sleep Disorders' Centre of St Thomas' Hospital in London, she pursued a second BSc in Nutrition & Dietetics plus the Dietetic Internship program at the Ohio State University, with a scholarship and a cum laude upon graduation, while working full-time at the Ohio State University Wexner Medical Center. She has significant working experience as a dietitian-nutritionist and biologist following her growing interaction with a plethora of patients in the UK, the US and in Greece; she has been trained in sports and elderly nutrition, CPR, eating disorders and food management, and has been providing optimum nutrition counseling for weight management and health problems. She was a lecturer and a laboratory instructor at New York College in Athens for many years, where she taught Nutrition and Biology courses as part of

the BSc (Honors) in Human Nutrition and the BSc (Honors) in Biomedical Sciences of the University of Greenwich, UK. She currently works for Bioiatriki Healthcare Group, being director of Bioiatriki+ Nutrition and clinical dietitian of BioClinic in Thessaloniki.

Joanne is a member of the Academy of Nutrition & Dietetics, and has served as CPE Chair of the American Overseas Dietetic Association (IAAND). She has co-represented the State of Ohio at the Academy's Public Policy Workshop in Washington DC in 2006, handling and promoting nutrition legislation issues. She has also been a highly involved member of the Hellenic Dietetic Association (HDA), as well as an organizing committee member of the 8th EFAD – DIETS Conference and past HDA Congresses. She has attended a plethora of conferences both in the U.S. and in Greece, often as an invited speaker or chair, while authoring articles and educating the community on nutrition and diet issues through live or webinar presentations, as well as on TV and the radio.

Evrydiki Kravvariti

Evrydiki Kravvariti is a US-board certified Internist who works at the University of Athens' Medical School as a lecturer, researcher, and clinician. She obtained her MD and Master's in Biostatistics at the University of Athens, the Specialty of Internal Medicine at the Albert Einstein College of Medicine (Jacobi) Campus in the Bronx, NY, USA, the Sub-specialty of Geriatrics at from New York University in NY, NY. Since 2012 she has returned to the University of Athens for her PhD and post-doctoral academic duties, which involve the creation and oversight of the first Greek Postgraduate Medical Education Program in Geriatrics. She engages in clinical work in ambulatory geriatric practice and as part of the interdisciplinary team of the Joint Rheumatology Program at Laikon General Hospital in Greece, a European League Against Rheumatism center of excellence and a member of the European Reference Network for Rare and Complex Rheumatologic diseases. Her research interests include atherosclerosis in patients with rheumatic diseases, contextual effects in therapeutics, multimorbidity, and frailty syndrome.

Alexandra Meziti

Biologist at the University of Athens. She has performed MSc studies on marine microbiology (Max Planck Institute for Marine Microbiology, Bremen, Germany) and her PhD on environmental microbiology (University of Thessaly). Her research interests lie on microbiomes analysis, investigating the changes in diversity and function under different environmental influences. Currently she is a postDoc at the International Hellenic University, working on the microbial diversity of human gut biopsies. She is a reviewer in several academic journals and member of scientific societies.

George Panayiotou

Acquired his Bachelor's Degree (BSc -1999) in Physical Education and Sports Science and his Master's Degree (MSc - 2001) in Strength and Conditioning (emphasis in Soccer) after completing his studies at the Aristotle University of Thessaloniki and Democritus University of Thrace respectively. His doctoral studies at the Democritus University led to acquiring a PhD (2007) in Physical Education emphasized in Exercise Physiology. His research focuses on the effects of exercise on the immune system, overtraining markers and on enhancing the physical capacity of elite athletes, the public and chronically diseased people. During his academic career he obtained several international research grants for projects he initiated and coordinated in exercise and health. He has also been elected and/ or appointed as a Board of Directors Member, Consultant and Participant of public and private

academic/athletic bodies, committees and structures, a referee of international scientific journals and an international member of academic institutes quality assurance bodies. He currently holds the Assistant Professor of Sport and Exercise Physiology position at the Department of Life Sciences; he Coordinates the Applied Exercise Science graduate (MSc) Program and the Laboratory of Exercise Health and Human Performance of the European University Cyprus. For more than 20 years, he has been offering his expertise as Sport and Exercise Physiologist professional in Soccer and other group and individual Sports at national and international level.

Sousana Papadopoulou

Obtained a PhD Philosophy from the School of Physical Education and Sports Science, in Aristotle University, Thessaloniki, Greece a Bachelor of Science in Nutrition and Dietetics from the Department of Nutrition and Dietetics, Technological Educational Institution of Thessaloniki, Greece and a Bachelor of Science in Physical Education and Sports Science, from the Department of Physical Education and Sports Science, Aristotle University of Thessaloniki, Greece. She has extensive teaching experience in the department of Nutritional Sciences and Dietetics of the International Hellenic University as Assistant Professor, with academic field "Human Nutrition and Dietetics", since 2014, while she served as a Research Fellow at the same department from 2002 to 2014. She held the same position at the laboratory of "Hygiene and Sport Nutrition", at the Department of Physical Education and Sports Science at the Aristotle University of Thessaloniki, Greece and for 5 year period (1998 to 2004) and simultaneously she has assisted in a research at the laboratory of "Sports Biomechanics", at the Dept. of Physical Education and Sports Science, Serres, Greece, 1999-2004. Her work is mainly focused on analyzing the role of physical activity, anthropometrics, dietetic, and psychological factors in body weight status, physical condition and well-being in athletes, and non-athletes in different age groups. Her work provides a useful link between physical activity and nutrition, encouraging research and teaching collaborations.



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