



Design by :
Amir Reza Khamineh
Hossein Doustabadi

ND 5

OREGANO

MEMBERS

Summer 2024

Edition5

concessionaire: Scientific Association of Nutrition
Varastegan Institute

Director in charge: Mona Nematizadeh

Editor in chief: Sanaz Aryayirad

Executive director: Shermin Ghiasi

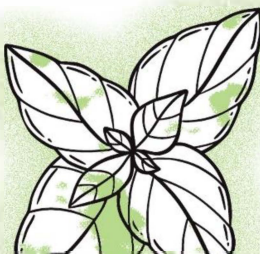
Design: Amir Reza Khamineh, Hossein Doustabadi

Editors: Ali Ghanavat, Ghazal Hosseinpour, Fatemeh Azad

Authors:

Aref Tabatabaei, Mahya Nikomanesh, Yegane Ghelichi , Mahdieh Zarif, Kosar Heydari, Bentolhoda Sabzghabaei, Susan Nikraves, Anita Mosayebzadeh, Saba Ghaffari, Ghazal Mostafavi, Sobhan Rahimian, Aida Ishaghi, Matin Madani, Mahdie Kamaljoo, Narjes Ayati, Seyyed Morteza Hosseini Beynbaj, Mozhdeh Cheraghi, Elham Goli, Melika Mohtaram, Maryam Razavi, Faezeh Dehghanzadeh, Sama Sedighfar, Roz Shayegi, Fateme Rajabalizadeh, Hossein Madahpour, Mina Mohammadinia, Mohammadreza Sabeti, Setareh Taghavi, Faezeh Zakeri

Special thanks: Aliakbar Azaryar, Sina Sarviha





Mona
Nematizadeh

DIRECTOR IN CHARGE



I want to extend my heartfelt appreciation to the talented team of writers who have contributed their time and expertise to "Organo." Your dedication to delivering valuable insights on nutrition and health has been essential to our journal's success.

As the newly appointed director, I'm excited to announce some significant enhancements for future editions. While our focus was previously on articles about specific organs and their functions, we will now curate topics from a wide range of reputable websites and research articles. Our aim is to provide the most up-to-date, relevant, and engaging content to help readers make informed decisions about their health.

We believe these changes will enhance your reading experience and offer valuable insights into nutrition. Thank you for your continued support, and we look forward to the exciting transformations ahead for "Organo."

Warm regards,



Sanaz
Aryayirad

EDITOR IN CHIEF



As the Editor-in-Chief of the Nutrition Science Journal, I am pleased to present our latest issue, showcasing innovative research from around the world. Our dedicated researchers and contributors have worked tirelessly to bring you cutting-edge findings in nutrition science.

We are confident that the insights in this issue will drive further advancements in the field. Our journal plays a vital role in fostering collaboration and dialogue among scholars, and we remain committed to maintaining the highest standards of excellence.

We believe our journal plays a crucial role in advancing nutrition science by fostering collaboration and dialogue among researchers. We are dedicated to continuously improving the publication, welcoming feedback from readers and contributors to better serve the scientific community. Your ongoing support and trust are deeply appreciated, and we look forward to delivering more cutting-edge research that contributes to a healthier, more sustainable world.



04 | The Effect of the Mediterranean Diet on Breast Cancer

07 | Oxidative Stress in Athletes and Sport's Nutrition Strategies

10 | Breastfeeding and The Risk of Childhood Obesity

12 | Research Patient Clusters based on Clinical, Diet, Lifestyle and Psychosocial factors associated with Irritable bowel syndrome

14 | Comparison of Nutrition Students Loyalty to their Diet with other Majors

18 | The Effect of Caffeine on Diabetes

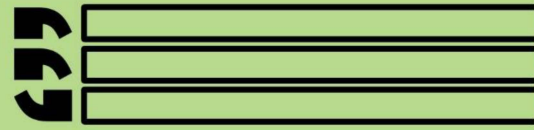
20 | Prevention and treatment of Orthorexia nervosa

23 | Nutrigenomics and Diabetes Mellitus

25 | Supplementation Therapy beside Enteral and Parenteral Nutrition for Hospitalized Patients in ICU

27 | New Technologies as Innovative Methods for Monitoring and Controlling Nutritional Problems





01

The Effect of the Mediterranean Diet on Breast Cancer

The authors:

Aref Tabatabaei
Mahya Nikomanesh
Yegane Ghelichi





Worldwide, breast cancer was the most frequently diagnosed cancer in both sexes in 2020. The incidence of breast cancer has surpassed lung cancer, as 2.3 million (11.7% of the total) new cases were estimated worldwide for that year



Diet is an important pillar of any lifestyle, and can be used as a beneficial factor to help prevent cancer in general, and breast cancer in particular addition, it may also reduce the risk of cancer progression. In addition to an energy imbalance, the interaction between several dietary nutrients and gene expression is of interest in the field of tumorigenesis.



A Mediterranean-style dietary pattern is believed to have cancer-protective effects. The link between dietary intake and breast cancer might be attributed to the indirect effect of specific nutrients on breast cancer due to their influence on inflammation, DNA damage and repair oxidative stress and genetic modifications

”

Dietary guidelines in the US recommend the Mediterranean diet as a healthy dietary pattern for the prevention of chronic disease risk, including cancer. The Mediterranean diet is a well-balanced plant-based diet. However, its specific definition varies somewhat due to the variations in culture, religion, ethnicity, and socio-economic status among and within the different Mediterranean countries. A Mediterranean diet is commonly characterized by frequent consumption of non-refined grains, vegetables, fruits, nuts, olive oil and dairy products, and moderate intakes of fish, poultry, potatoes, legumes, eggs and sweets. Finally, moderate intake of red wine during meals and increased physical activity are important components of the Mediterranean lifestyle.

These nutrients include fatty acids, polyphenols (resveratrol, compounds, quercetin) and micronutrients (Zinc and Selenium) commonly found in a Mediterranean-style diet.

1. Fatty acid

The consumption of monounsaturated fatty acids (MUFAs) present in olive oil, has shown a benefit with regards to some types of breast cancer prevention and survival. The consumption of fish oil and some plant-based oils can play a protective role by reducing chronic inflammation and antioxidative stress. Omega-3 fatty acids play an important role in inhibiting NF- κ B activity and pro-cytokine production, both of which are considered essential mechanisms of omega-3 fatty acid action in cancer, including cancer of the breast.





2. Resveratrol

Resveratrol is found in numerous plant-based products, including grapes, blueberries and some nut varieties. The epigenetic effects of resveratrol have been assessed in several studies. Resveratrol has been under investigation in terms of its effect on inflammation and oxidative stress for some time.

3. Quercetins

Quercetins are found in fruits, such as apples and grapes, and in specific vegetables such as onions, kale, broccoli, lettuce and tomatoes. Quercetin has been shown to have a protective effect on anti-cancer activity by suppressing the activity of COX2, and NF- κ B.

4. Zinc

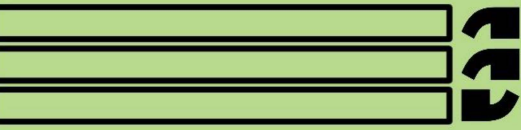
Zinc contributes to the regulation of many intra- and extra-cellular pathways involved in cell proliferation, differentiation, development, apoptosis, and transformation. Zinc is found in abundance in egg yolks, meat, poultry, legumes, peanuts, wheat and cocoa. It has been proposed that zinc intake might be essential to protect against breast cancer progression and recurrence.

5. Selenium (Se)

Se is naturally obtained from food such as onions, broccoli and grains, depending on the Se content of the soil upon which they were grown. A recent human trial revealed evidence of the linkage between selenium serum level and breast cancer recurrence and it also has the protective effect by reducing oxidative stress.

BREAST
CANCER





O2

Oxidative Stress in Athletes and Sport's Nutrition Strategies



The authors:

Mahdieh Zarif

Kosar Heydari

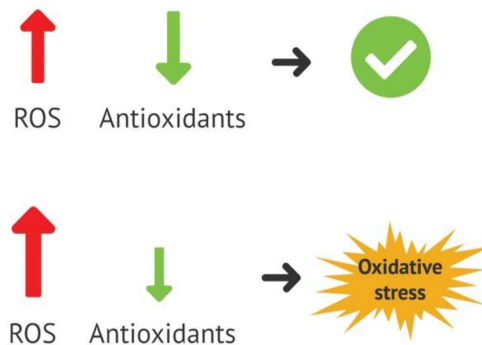
Bentolhoda Sabzghabaei



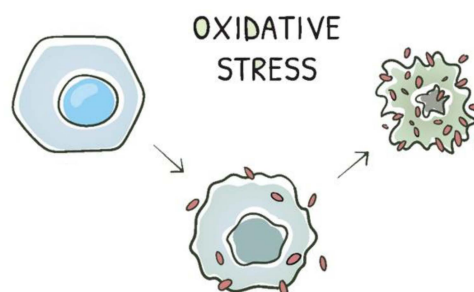
Oxidative stress is a condition in which there is an imbalance between the production of reactive oxygen species (ROS) or reactive nitrogen species (RNS) and antioxidant defense in the body. This excess ROS or RNS can cause cellular damage and dysfunction and is linked to conditions such as inflammation, muscle fatigue and a range of other diseases.

In athletes, oxidative stress can occur due to factors such as high-intensity exercise, exposure to environmental pollutants and inadequate nutrition. Intense exercise increases the rate of metabolism and consequently oxygen consumption and increases the production of free radicals. In cases where the antioxidant mechanism to remove the free radicals of living organisms is absent or insufficient, damage to the body by oxidative stress cannot be prevented. Overall, understanding the mechanisms of oxidative stress and its potential effects on athletic performance and health is important for optimizing training and recovery in athletes, as well as for developing effective nutritional interventions to support optimal performance.

According to articles, exercise can increase oxidative stress in the body by creating an imbalance between the production of ROS and the body's ability to detoxify and repair damage caused by these ROS. During exercise, ROS production increases due to increased energy metabolism and oxygen consumption. This can lead to cellular damage and dysfunction, which over time can contribute to muscle fatigue and impaired athletic performance. In addition, exercise can also lead to the production of other stressors such as inflammation and hormonal imbalance, which can exacerbate oxidative stress in the body. The combination of these factors can ultimately contribute to oxidative stress and related health problems in athletes.



Various types of exercise lead to muscle dysfunction, increased muscle pain for several days and increased concentration of myofibril proteins (creatine kinase (CK) and lactate dehydrogenase (LDH)) in the blood. Loss of muscle strength combined with increased muscle damage may have a detrimental effect on muscle function. The effect of exercise training may require the use of antioxidant supplements to prevent muscle damage and oxidative stress.



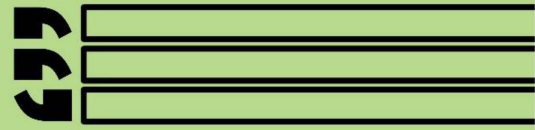


Nutritional Strategies:

Various nutritional strategies, especially in athletes, are being studied by researchers to reduce oxidative stress at the cellular level. Consumption of foods rich in antioxidants and containing vitamins C and E, carotenoids and flavonoids in the diet during or after exercise plays an essential role in reducing oxidative stress, but the use of nutritional supplements to increase the benefits of exercise, reduce biological problems and improve performance is also common. The reviewed studies suggest the following dietary supplements:

1. **Carbohydrate Supplementation:** Carbohydrate intake before and during exercise can improve endurance performance by providing fuel to working muscles.
2. **Creatine Supplementation:** Creatine is a natural compound in the body that helps produce ATP, the energy source for muscle contraction. Creatine supplementation has been shown to increase strength and power output during high-intensity exercise.
3. **Beta-Alanine Supplementation:** Beta-Alanine is an amino acid used to produce carnosine, which helps buffer acid in the muscles during exercise. Beta-alanine supplementation has been shown to delay fatigue during intense exercise.
4. **Caffeine Supplementation:** Caffeine is a stimulant that can improve alertness, concentration and sports performance. It has also been shown to reduce stress and perceived fatigue during exercise.
5. **Antioxidant Supplementation:** Antioxidants such as vitamins C and E, beta-carotene, and selenium can eliminate free radicals and reduce oxidative stress. Some studies have shown that antioxidant supplements may improve endurance performance and reduce muscle damage in athletes. For example, vitamin E supplementation led to a significant decrease in CK concentration in studies conducted on aerobic exercise rather than resistance exercise; even contrary to expectations, it was found that a dose of less than 1000 international units per day of vitamin E has a significant effect on reducing CK. And it seems to be effective in reducing the immediate muscle damage that occurs after aerobic exercise.
6. **Omega-3 fatty acid Supplementation:** Omega-3 fatty acids are anti-inflammatory and may help reduce inflammation and oxidative stress in the body. Some studies have shown that omega-3 fatty acid supplementation may improve endurance performance and reduce muscle damage in athletes.
7. **Polyphenol Supplementation:** Polyphenols are plant compounds with antioxidant and anti-inflammatory properties. Some studies have shown that polyphenol supplementation may improve endurance performance and reduce muscle damage in athletes.
8. **Melatonin Supplementation:** Oxidative stress plays a role in causing chronic diseases. Studies also show that melatonin supplementation has a significant effect on reducing oxidative stress and increasing antioxidant performance by significantly reducing the levels of oxidative biomarkers such as malondialdehyde (MDA) and also significantly increasing the total antioxidant capacity (TAC). Melatonin supplementation can be suggested as a safe complementary approach in improving chronic diseases.

Overall, these studies suggest that a combination of nutritional strategies, including carbohydrates, creatine, beta-alanine, caffeine, antioxidants, omega-3 fatty acids, polyphenol and melatonin supplement, may be effective in reducing muscle fatigue and oxidative stress in athletes.



O3

Breastfeeding and The Risk of Childhood Obesity

The authors:

Susan Nikraves
Anita MosayebZadeh
Saba Ghaffari





Obesity is a major public health concern globally, linked to lifestyle habits. The occurrence of obesity in children has increased significantly in recent decades, not just in developed nations but also in developing ones. The prevalence of childhood obesity has significantly surged, and it is now considered a global issue that has adverse impacts on both physical and mental health. This issue also has substantial costs for both individuals and governments. Childhood overweight is a reliable indicator of future adult obesity and other negative health outcomes, especially type 2 diabetes and cardiovascular disease in adolescence and adulthood. Therefore, preventing obesity is crucial to managing its widespread occurrence, and it is vital to identify modifiable factors that increase or decrease the risk of obesity.



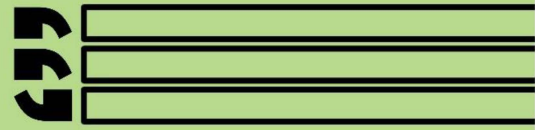
Children and mothers who breastfeed them have been linked to improved long-term health outcomes. In particular, analyses of multiple studies have indicated that breastfeeding might provide protection against childhood infections and dental misalignment, boost cognitive development, and potentially lower the risk of being overweight and developing asthma and diabetes. The advantages of breastfeeding during early childhood are widely acknowledged and it is recommended as the primary source of nourishment for infants during the first six months of life.

Presently, the data regarding the effect of breastfeeding on childhood overweight is inconclusive, with some studies demonstrating a strong correlation while others revealing a weak or nonexistent connection between breastfeeding on childhood obesity. Some evidence suggests that early life exposures may increase the likelihood of obesity. Breastfeeding has been proposed as a possible protective factor against overweight. Based on new evidence (2022), it has been shown that [breastfeeding can have positive effects on obesity in children.](#)

In essence, infants who were solely breastfed for a minimum of 4 months had reduced BMI levels when they were aged between 2 to 5 years old compared to those who did not breastfeed exclusively for that duration or not at all. With regards to BMI categories, among infants exclusively breastfed for at least 4 months, 16.2% were overweight and 7.7% were obese. Conversely, among infants who were not exclusively breastfed for at least 4 months or had not been breastfed at all, a significantly higher occurrence of overweight (20.2%) and obesity (10.7%) was observed in comparison to infants exclusively breastfed for at least 4 months. Also, A recent meta-analysis (2020) indicates that breastfeeding is linked to a reduced risk of early childhood obesity in children aged between 2 to 6 years.

“

According to what was obtained in the observations, the positive effect of breastfeeding in children's obesity has been confirmed, but in some articles, different results were obtained and this requires more studies.



Q4

Research Patient Clusters based on
Clinical, Diet, Lifestyle and
Psychosocial factors associated with
Irritable bowel syndrome

The authors:

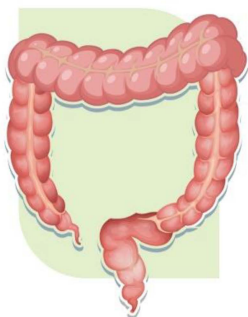
Ghazal Mostafavi
Sobhan Rahimian
Aida Ishaghi





Irritable bowel syndrome (IBS)

Is a functional gastrointestinal (GI) disorder that is characterized by abdominal pain, bloating and altered bowel habits. It is the most commonly diagnosed GI disorder, estimated to affect approximately 11% of the global population, with an increased prevalence in women as compared to men. IBS has repeatedly been demonstrated to both reduce the quality of life (QoL) and increase health care utilization, leading to a significant economic burden. Disturbances in the GI microbiome may be involved in its etiology. It has a relapsing and remitting natural history.



The global prevalence of the condition in the community is approximately 10%, depending on the criteria used to define its presence, although using the latest Rome IV criteria it is lower, estimated at 6%. Despite being common, only a minority of people who report symptoms suggestive of IBS will consult a physician.

Because the pathophysiology of the disorder remains incompletely understood, medical treatment is empirical and is usually based on targeting the predominant symptom reported by the patient. This leads to unsatisfactory control of symptoms for many patients and, therefore, alternative approaches are needed.

The concept that alterations in the gut microbiome might be relevant to IBS arose from observations that symptoms of IBS often developed after an infection, known as post-infectious IBS. Furthermore, small intestinal bacterial overgrowth (SIBO) may cause symptoms indistinguishable from IBS and data suggest that the colonic microbiome is altered in patients with IBS, when compared with healthy controls.

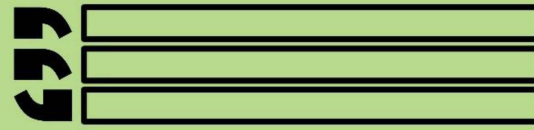
In addition, some IBS symptoms, such as bloating, slowed GI transit and early satiety have been associated with specific gut microbiome profiles.

Which particular combination, species or strains of probiotics are effective for IBS remains, for the most part, unclear. Rifaximin has modest efficacy in improving symptoms in non-constipated IBS. The low-FODMAP (LFD) reduced IBS severity by a moderate-to-large extent. And also, the LFD diet reduces GI symptoms and improves the QoL in IBS subjects.

“

Future work is required to obtain definitive answers regarding the potential long-term effects of such diets on nutritional adequacy and the gut microbiome.

”



Q5

Comparison of Nutrition Students Loyalty to their Diet with other Majors

The authors:

Matin Madani
Mahdie Kamaljoo
Narjes Ayati

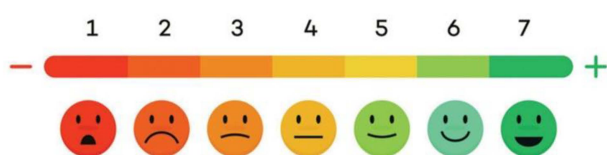




Healthy nutrition should be promoted as part of school and university programs. Adolescents and young adults spend a considerable amount of their time in school or university and consume at least one meal there. In general, the educational environment plays a significant role in influencing the dietary choices of students.

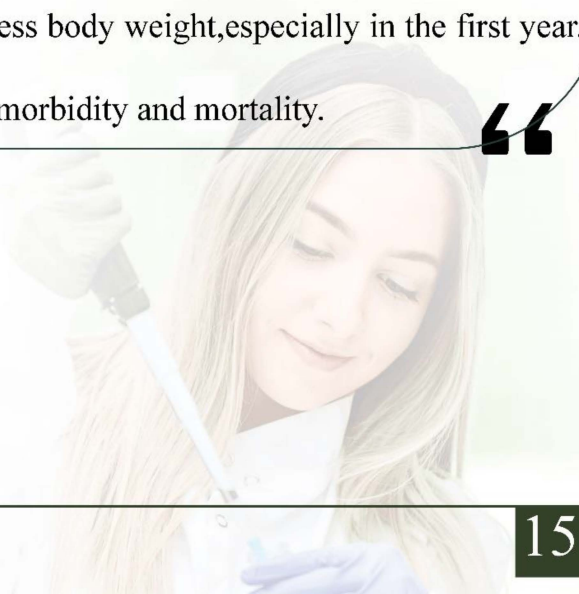
-An observational study conducted by Hanson et al. in 2020 aimed to investigate the relationship between education level and food choices among students from second to twelfth grade. Various aspects such as food selection, favorite foods and least and most preferred items were examined in this study. Participants expressed their preferences using a 1–7 -point emoji scale (with emoji code 1 for the most negative and emoji code 7 for the most positive). Across all levels, homemade food was the most preferred, followed by breakfast items, fruits, lunch items and vegetables (cooked and raw). The breakfast and lunch preference scores were higher among middle school students compared to high school students.

However, when young adults go to university, they often face various challenges, such as a new environment, academic stress, poor time management, and rigorous coursework, which may lead to a lack of interest in their health. College students encounter significant changes in their eating behaviors and dietary patterns. These unhealthy practices can potentially impact academic performance and the individual's future, which is related to their professional success and future life. Therefore, in this study, we aim to compare the behaviors of students from different universities and in the next step, we want to see if the level of adherence to a diet differs significantly between students studying nutrition science and students from other fields.



- The shift to university life increases the risk of excess body weight, especially in the first year.
- Obesity is a major global health challenge,
- with a high economic cost and a significant risk of morbidity and mortality.

We reviewed a cross-sectional study by Fernando D. Solís-Guevara, which aimed to compare diet and overweight/obesity in two groups of students: human nutrition students (HNS) and students from other careers (SOC) at the University of Lima in Peru. The study consisted of 158 students out of an initial sample of 170.





The researchers developed a questionnaire consisting of five sections:

- 1) an introduction to the study including a presentation of the researchers, title, purpose and relevance, with consent obtained;
- 2) collection of socio-demographic, scientific, medical and anthropometric data;
- 3) request for information on diet, including the type of diet followed;
- and 4-5) completion of a food frequency questionnaire (FFQ).

As a result, they found that there was no significant evidence of differences in diet and overweight/obesity between HNS and SOC at a private university in Lima, Peru. However, there were statistically significant differences in the consumption. For example, HNS had a higher frequency of consuming yellow/orange vegetables, purple vegetables, citrus fruits, eggs, whole milk, yogurt, tofu, olive oil, other vegetable oils and alcoholic beverages compared to SOC. On the other hand, HNS had a lower frequency of consuming non-fried tubers, fried tubers, milk desserts, flour fritters, cookies with chocolate, croissants, cookies with filling, candies and soda compared to SOC.



In another cross-sectional study, Christine E. Cherapk-Castagna et al. examined the description of dietary choices of future nutrition practitioners and identified factors that influence graduate nutrition students' dietary patterns and clinical recommendations in a sample of 208 participants in the nutrition field from five American universities. An anonymous online survey was distributed to graduate-level clinical nutrition students. Data collected included demographics, current diet, reasons for following the current diet, reasons for recommending diets and degree completion status. The percentage of diets chosen and the rationale for dietary decisions were compared. Diets chosen and recommended were stratified and compared by degree completion status via a chi-square test. The researchers concluded that the top diets students reported following were Whole Foods/Unprocessed and Gluten-Free, followed by Vegan/Vegetarian and Paleo. The most frequently cited reasons for choosing a personal diet were health optimization, intolerance, allergies and food sensitivities. The top factors used to make dietary recommendations were clients' preferences/resources and the results of laboratory testing. A Whole Foods/Unprocessed diet was the most followed diet and the one most likely to be recommended to future clients, irrespective of students' degree completion progress.



Various factors influence eating behavior, such as unstable eating habits, unhealthy eating patterns, excessive internet use and a sedentary lifestyle. Eating behavior or the way food is consumed is an important issue as it can lead to future health problems and nutritional deficiencies

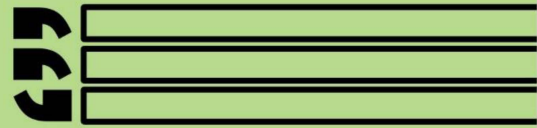
In another study conducted to evaluate different dietary patterns among students at a Portuguese university, 169 individuals participated, ranging from 18 to 50 years old. The eating behavior was categorized into three groups: emotional eating (using food to cope with psychological problems or alleviate them), restrained eating (consciously restricting food intake) and external eating (external and environmental factors significantly influence their food consumption). The only requirement for participation in the study was being 18 years old or older, currently a university student and initially appearing healthy, resulting in a wide range of participants. The participants' eating behavior was assessed using the Dutch Eating Behavior Questionnaire (DEBQ), and the following results were obtained:

- Restrained eating behavior: 33 individuals
- External eating behavior: 73 individuals
- Emotional eating behavior: 63 individuals

Furthermore, 62.10% of nutrition science students exhibited emotional eating behavior. In continuation, each student from various fields was provided with a Mediterranean diet, and ultimately, the adherence of the nutrition students to the prescribed diet (as opposed to having emotional and impulsive eating patterns) was higher compared to other students.



Based on the findings of these three studies, it can be concluded that the level of adherence and preference for healthy diets and proper nutritional recommendations is higher among nutrition students compared to students from other fields. Therefore, there is a direct relationship between the nutrition science field and the adoption of a proper diet.



06

The Effect of Caffeine on Diabetes

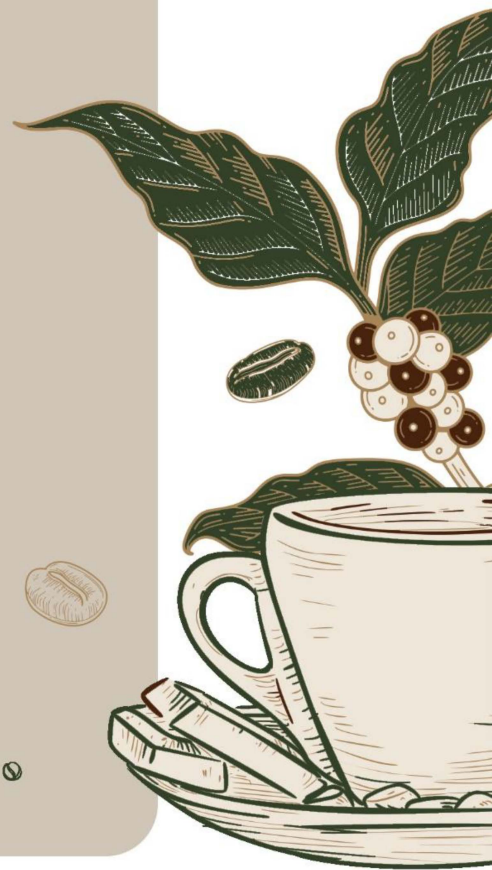
The authors:

Seyyed Morteza Hosseini Beynabaj
Mozhdeh Cheraghi





Caffeine is a naturally occurring stimulant found in various plants, including coffee, tea, cocoa and kola nuts. It is also added to some foods and beverages such as soft drinks, energy drinks and certain medications. The effects of caffeine can vary depending on the individual and the amount consumed. Caffeine works by blocking the action of adenosine, which is a neurotransmitter that promotes sleep and suppresses arousal. When adenosine is blocked, the brain produces more other neurotransmitters, such as dopamine and norepinephrine, which promote wakefulness and increase alertness. This mechanism of action is well-established and supported by numerous studies. According to the Food and Drug Administration (FDA), caffeine is considered safe in moderate doses, which is usually defined as up to 400 milligrams per day for healthy adults. This is roughly equivalent to four cups of brewed coffee, 10 cans of soda or two energy drinks. However, consuming too much caffeine can cause a range of side effects, including anxiety, insomnia, tremors and rapid heartbeat. In some cases, it can also lead to more serious health problems such as high blood pressure and heart disease. For most people, caffeine is a part of their daily routine and can provide a boost of energy and mental clarity. Recent studies have also suggested that moderate caffeine consumption may be associated with a lower risk of certain health conditions, such as type 2 diabetes (T2DM), Parkinson's disease and liver disease. In this article, we explain the effect of caffeine on diabetes.



T2DM belongs to the most frequently internationally frequent metabolic disorders and its development is primarily caused by a conjunction of 2 primordial components: the secretion of defective insulin by pancreatic β cells and the unviability of the tissues prone to insulin to answer insulin. The liberation and action of insulin must quench exactly the metabolic demand; therefore, the molecular mechanisms related to the synthesis and liberation of insulin, as well as the answer to the insulin in the tissues must be closely regulated. Therefore, deficiencies in any person of the related mechanisms have the possibility of leading to a metabolic imbalance that leads to T2DM pathogenesis. T2DM is a complex metabolic pathology elaborated more frequently in medium-sized and larger people with precedents of diabetes and obesity. Asian, Hispanic, American and African-American populations have a high prevalence of T2DM. The largest part of patients with diabetes (70%) has overweight or obese and the obesity rate is expected to increase by 33% in the following 20 years. Diabetic and obese patients have a greater danger of cardiovascular pathology (CV), the primary cause of death in western nations. Patients with T2DM are insulin-resistant and glucose intolerant in skeletal muscle, adipose tissue and liver. Thus, hyperglycemia induces vascular complications in blood vessels, kidney, heart and liver, and can cause kidney and retinal disorders and macrovascular complications.





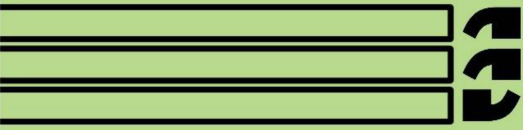
Intakes of caffeinated and decaffeinated coffee and caffeine were found each inversely associated with C-peptide concentration, a marker of insulin secretion in the Nurses' Health Study. In addition, the antioxidants such as chlorogenic acid, polyphenols and lignan as well as magnesium, which are rich in coffee, might also contribute to the observed protection of regular coffee and decaffeinated coffee on T2DM risk. Furthermore, caffeine might also protect against T2DM incidence through increasing metabolic rate and thermogenesis, stimulating fat oxidation and free fatty acid release from peripheral tissues and mobilizing glycogen in muscles. Among the 8 studies providing subgroup analysis by sex for coffee, the magnitude of association was stronger for women than that for men in 5 studies, while similar results were found in the other 3 studies. The association between coffee and T2DM incidence was slightly attenuated after adjusting for smoking as well as alcohol and physical activity. Body Mass Index (BMI) was found an important predictor of T2DM incidence; thus, the benefits of coffee consumption on T2DM incidence might also be canceled out by the adverse effects of higher BMI. Subgroup analysis by BMI (≥ 25 kg/m²) also suggested that BMI might be a modifier on the association of coffee with T2DM risk, and subgroup analysis suggested that age might also be a modifier. Coffee is rather rich in magnesium, which is also significantly inversely associated with T2DM incidence, and the association of coffee with T2DM incidence was slightly attenuated after adjusting for magnesium. Adjustment for total energy intake, which is positively associated with coffee consumption, also slightly attenuated the association. An earlier review suggested that every 1 cup/day increment in coffee intake was associated with a 7 % reduction in the excess risk of T2DM.

Diabetes

Caffeine

References:

- (Nehlig, Astrid. "Is caffeine a cognitive enhancer?" *Journal of Alzheimer's Disease* 20.s1 (2010))
- (Vieira, Abel JSC, Elvira M. Gaspar, and Pedro MP Santos. "Mechanisms of potential antioxidant activity of caffeine." *Radiation Physics and Chemistry* 174 (2020))
- (Lin, Yan-Han, Hsiao-Wen Huang, and Chung-Yi Wang. "Effects of high pressure-assisted extraction on yield, antioxidant, antimicrobial, and anti-diabetic properties of chlorogenic acid and caffeine extracted from green coffee beans." *Food and Bioprocess Technology* 15.7 (2022))
- (Galicia-Garcia, Unai, et al. "Pathophysiology of type 2 diabetes mellitus." *International journal of molecular sciences* 21.17 (2020))
- (Jiang, Wenjie, Yili Wu, and Xiubo Jiang. "Coffee and caffeine intake and breast cancer risk: an updated dose–response meta-analysis of 37 published studies." *Gynecologic oncology* 129.3 (2013))



07

Prevention and treatment of Orthorexia nervosa



The authors:

Elham Goli
Melika Mohtaram
Maryam Razavi



(ON)

Orthorexia nervosa is a relatively new eating disorder. The Greek words *orthos* (correct) and *orexis* (appetite), describes persons whose focus on "healthy" diets leads to malnutrition and impairment of health. It is a psychologically motivated obsessive-compulsive disorder, involving excessive concentration on healthy eating. Although a healthy lifestyle and a balanced diet are desirable due to their positive impact on health, exaggerated concentration on healthy eating may become pathological and imply negative effects, as exemplified by the existence of orthorexia nervosa. It should be noted that orthorexia nervosa must be differentiated from healthy orthorexia, which is a "healthy interest in diet, healthy behavior with regard to diet, and eating healthily as part of one's identity".



People with orthorexia pay special attention to the quality of food they eat and to the technique and equipment used in its preparation, which leads to the elimination of certain products from their diet like foods that are highly processed or contain artificial additives. Orthorectic patients create specific patterns of behavior, for example, by not combining certain foods or eating selected foods only at specific times of the day or at specific intervals and some of them some give up food processing and eat it raw. They may feel the urge to punish themselves, which leads to stricter dietary restrictions or the use of purifying starvation diet, too much concentration on dietary choices is reflected in the functioning of the patient in society. Such a person avoids meeting friends, especially in places where meals are eaten.

ON has a bidirectional relationship with endocrine and metabolic disease and some unique variants of orthorexia are frequently encountered in endocrine practice. These include overzealous avoidance of salt, of cereals, or of carbohydrates, and over consumption of fruits, artificial sweeteners or proteins, in a misinformed effort at healthy eating behavior.

The prevalence of ON in society ranges from 1% to 60% and is mainly related to lifestyle. Over the recent years we have seen an increased interest in healthy food, which is free from contaminants and substances considered unfavorable to health. This beneficial trend, in some people takes the form of pathological anxiety and obsession about the quality of food they consume. Some social or professional groups are particularly exposed to orthorexia, for example, athletes, dieticians, healthcare workers and medical students, artists, people who have had eating disorders before, and those with unique eating habits. The risk of ON was lower with age. The sex and education of the subjects had no significant effect on the risk of the disorder. The authors stress that the occurrence of risk of ON is linked to non-dietary aspects related to appearance and physical activity. Due to ON increase, we should pay more attention to the prevention and treatment of ON.



It is better to prevent ON before this disorder occurs. It should be explained to people that health is much more than body mass index or weight number. Quinary prevention to curb commonly encountered misinformation about fad diets, rapid weight loss techniques and nonscientifically tested weight losing commercial products will also help to prevent development of orthorexia. The wide and rapid dissemination of health related misinformation on various social media platforms should be controlled. The prevention of ON disorder requires both individual and social control, since the control of virtual spaces is a complex and almost impossible task, individual prevention is more important and effective.

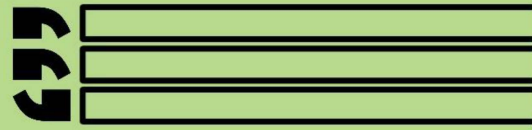


If ON does occur, early identification and management is the key to limitation of complications. This is done by screening for orthorexia nervosa in high risk patients. This would include all persons living with conditions that require nutritional management, including obesity, diabetes, NASH, PCOS, dyslipidemia and cardiovascular disease. **Screening can be done clinically by using a simple two-item questionnaire**, while confirmation of diagnosis may need the use of more elaborate validated instruments.



Unlike patients with anorexia nervosa (AN), patients with ON are more easily treated with an emphasis on health. There were no studies on the effectiveness of psychotherapy or psychoactive drugs for patients with ON. However, several treatments have been proposed due to the overlap of symptoms with AN. Serotonin reuptake inhibitors may be beneficial for anxiety and obsessive-compulsive traits. However, patients with ON may refuse medications as unnatural substances. Cognitive behavioral therapy may be beneficial to address perfectionism and cognitive distortions, and exposure and response prevention may reduce obsessive-compulsive behaviors. Relaxation therapy may reduce mealtime anxiety. Psychoeducation may correct inaccurate beliefs about food groups, purity, and preparation, but it may induce emotional stress for the patient with ON.





O8

Nutrigenomics and Diabetes Mellitus

The authors:

Faezeh Dehghanzadeh
Sama Sedighfar
Roz Shayegi





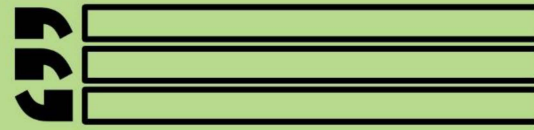
Diabetes mellitus (DM)

is a global pandemic, with increasing incidence worldwide. DM is the ninth leading cause of death and is estimated to impact 693 million adults by 2045. DM occurs when the body produces insufficient insulin or uses it improperly. The majority of cases of DM can be broadly categorized into two etiopathogenetic groups: type 1 and type 2 DM (T1DM and T2DM, respectively). T1DM, previously referred to as insulin-dependent diabetes or juvenile-onset diabetes, results from the autoimmune destruction of pancreatic cells. As a result, patients with T1DM require exogenous insulin to maintain normal blood glucose levels. Although individuals with T1DM have a genetic predisposition. Environmental factors such as dietary components are also known to contribute to the development of the disease. The primary characteristics of T1DM and T2DM are contrasted, and current categorization for DM is discussed. Although there is no cure for it, maintaining a healthy weight, eating well and exercising can help.



Every person has a unique nutritional blueprint encoded in their genes, where bioactive food components and nutrients can affect gene expression. Nutrigenomics is the science that studies gene-nutrient interactions (nutrigenetics), leading to personalized nutritional recommendations for optimal health and disease prevention. Ethnic diversity in the genome can affect nutrient bioavailability and metabolism. Using nutrigenomics in clinical settings can be an effective approach for long-term lifestyle changes, leading to weight loss and improved quality of life. Nutrigenomics builds on transcriptomics, proteomics and metabolomics to understand the interaction between food components and the body.

Chronic non-communicable diseases (NCDs), such as coronary heart disease, high blood pressure, cancer or DM tend to aggregate in families, with a higher risk among relatives compared to the general population. Genetic variation and inheritance contribute to NCD susceptibility through the modulation of the response to nutrients or diets. Genome-wide association studies (GWAS) have identified genomic variants that predispose individuals to DM, with certain dietary variables also playing a significant role. Single-nucleotide polymorphisms (SNPs) are the most common type of genetic variation in the human genome that can alter the risk of developing DM. Recent GWAS have identified multiple T1DM-associated tagging SNPs, but these loci do not fully explain the heritability of DM estimated from familial studies. This writing aims to provide insights into the role of nutrient-gene interactions in DM pathogenesis, prevention and treatment. An individual's genetic makeup can affect nutrient metabolism and the response to nutrient intake, potentially leading to DM. Further research in this field will provide a framework for the development of genotype-dependent food health promotion strategies and the design of dietetic approaches for the prevention and management of DM. Specific targeted nutritional advice, such as following a Mediterranean Diet, has been shown to decrease cardiovascular risk factors and stroke incidence in people with polymorphisms strongly associated with T2DM.



09

Supplementation Therapy beside Enteral and Parenteral Nutrition for Hospitalized Patients in ICU

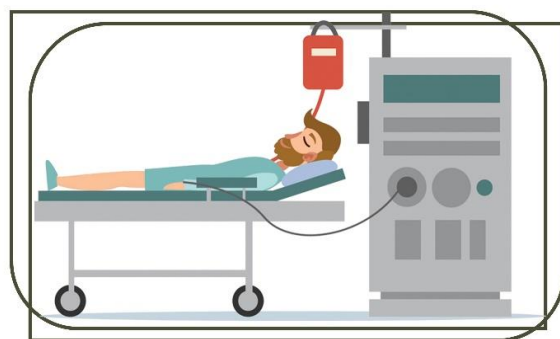
The authors:

Fateme Rajabalizadeh
Hossein Madahpour
Mina Mohammadi nia



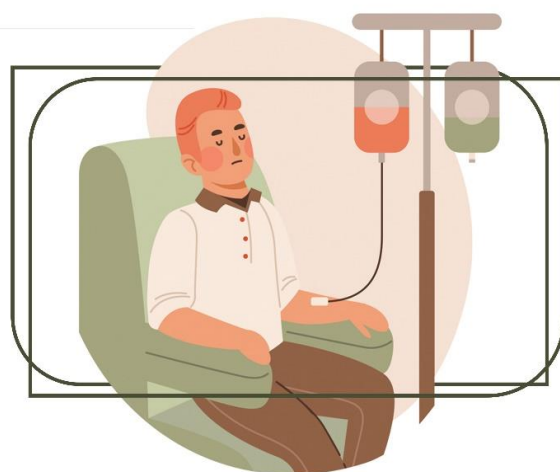


With advances in the medical field, more attention has been paid to the key role of nutrition in health and disease prevention. One of the most sensitive departments in hospitals is the intensive care unit (ICU), where patients are supervised and examined with the most sensitive methods. In addition to pharmaceutical treatments and surgeries, parenteral nutrition (PN) and intravenous nutrition (IN) are mentioned among the most effective methods in treating patients admitted to the ICU. The role of vitamins and minerals in normal cell functions, energy metabolism, prevention of inflammations, proper function of the immune system and proper cell division are evident by far. In this study, we intend to discuss the importance of supplemental assistance accompanied by PN and IN routes in the survival and recovery of patients hospitalized in the ICU.

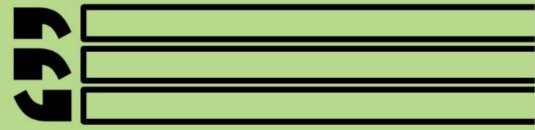


Although the use of drug therapy and its positive effects on patients cannot be ignored, the use of vitamin supplements that boost the body's immune system, such as vitamin C in the amount of 500 mg per day, contributes to reducing the hospitalization period of patients suffering from severe COVID-19 disease without any negative effects on kidney function and serum electrolyte balance.

Studies in this field have been conducted to increase the patient's life expectancy, and nutritional adequacy and reduce the duration of hospitalization, using some supplementary compounds, which include omega-3, vitamin C and vitamin D. It has been demonstrated that not only treatment does not always improve the person's circumstance, but also it can sometimes be useless. Supplemental medications containing Polyunsaturated Fatty Acids (PUFA) and Omega-3 therapeutic sources were ineffective in treating the medical condition and only reduced the duration of hospitalization and PN feeding course. Moreover, inconsistent evidence existed based on the positive effect of vitamin D supplementation on the recovery of patients admitted to intensive care units with moderate and severe disease degrees, which was also denied by the conducted studies.



However, the studies conducted in this department are not adequate to draw a certain conclusion and further studies are recommended to be conducted on a larger sample of patients admitted to this department in addition to the patients with COVID-19.



10

New Technologies as Innovative Methods for Monitoring and Controlling Nutritional Problems

The authors:

Mohammad Reza Sabeti
Setareh Taghavi
Faezeh ZakeriFar





Recent advancements in nutrition monitoring have leveraged wearable devices and digital tools like mobile apps to track calorie intake, glucose levels, and dietary habits. These tools, powered by large nutritional databases and machine learning, help users make better meal choices and adjust their dietary behaviors. However, challenges remain, including the limitations of self-reported data.

Technology in Nutrition: Mobile Apps

Diet apps simplify logging food intake, as users can access comprehensive nutritional databases directly from their phones. Apps for diet management often let users set goals, monitor daily intake, and receive ongoing feedback, helping users stay on track. Many of these apps also allow for social interaction and can be linked to devices like smart scales or continuous glucose monitors (CGMs) for a more complete view of users' health progress.

Nutrition Monitoring: Integrating Wearable Technologies and Analytics

Digital and wearable tools, combined with big data analytics, have improved calorie tracking and metabolic profiling. Innovations like smart dining tables that measure food weight and camera-based systems that analyze food images help assess portion size and total calories, offering an accurate overview of caloric intake.

Sensors for Nutrition Monitoring

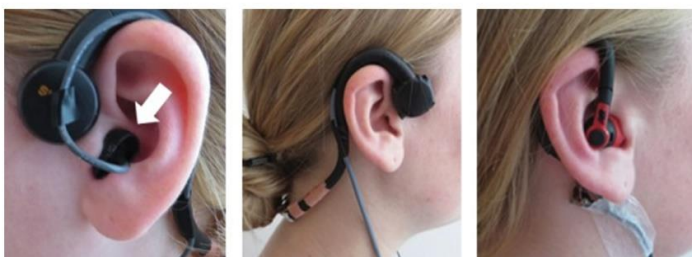
Electrochemical sensors are essential for precise nutrition tracking, capable of detecting minerals in bodily fluids and supporting dietary adjustments. These sensors track essential nutrients like iron, zinc, and vitamins, providing valuable feedback for nutritional improvement and health management. New developments in portable sensors are also enhancing food composition analysis for real-time dietary assessments.

Glucose Monitoring

Continuous glucose monitoring (CGM) devices are widely used for real-time glucose tracking, especially valuable for diabetic patients. These devices provide a detailed picture of blood sugar fluctuations, which can be critical for dietary management. Laboratory-based and portable sensors further assist by offering detailed nutrient breakdowns from food.

The SPLENDID Eating Detection Sensor

Current self-reporting methods often produce inaccurate data, but advanced technologies like the SPLENDID Eating Detection Sensor, which uses sensors and algorithms to detect eating events automatically, help reduce underreporting and track food intake more accurately. Despite its promise, this technology is not yet widely available for everyday use.



Conclusion

Technology has significantly improved nutrition monitoring, making it easier for users to manage their diets through mobile apps and wearable devices. While these tools offer convenient and accessible options for tracking nutrition and health goals, evidence-based apps and professional guidance are essential for meaningful dietary improvements. Further development of advanced sensors like CGMs could deepen our understanding of diet-health connections.



OREGANO

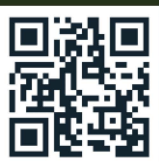


//

Health starts from your plate

//

Nutrition Journal from Varestegan Institute
of Medical Sciences



To download the
electronic version
Scan this qr code.