

# هُوَ الْحَكِيمُ

۱۴۰۴ اسفند ۱۳۰۲

21-23 February 2024

تهران، مرکز همایش های  
بین المللی ابوریحان،  
دانشگاه شهید بهشتی

The 4<sup>th</sup> International & 16<sup>th</sup> Iranian  
Nutrition Congress



چهارمین کنگره بین المللی و  
شانزدهمین کنگره سراسری تغذیه ایران

دستاوردها و چالش‌ها در نظام غذا و تغذیه: نگاهی به افق‌های جدید  
Achievements and Challenges in Food and Nutrition System: Approaching toward new Horizons



دارای امتیاز بازآموزی



دانشگاه علوم پزشکی و خدمات بهداشتی درمانی تهران



انجمن تغذیه ایران  
تاسیس ۱۳۶۴



سند بنیادی تولیدکنندگان  
مکمل‌های رژیمی غذایی  
ایران

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The 4<sup>th</sup> International and 16<sup>th</sup> Iranian Nutrition Congress

23-21 February 2024, Tehran-Iran

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## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress

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## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress



**Dr. Hossein Farshidi**

Deputy Minister of Health  
Ministry Of Health and Medical Education

### **Dear esteemed colleagues and friends,**

The Iranian Nutrition Congress, which has been held concurrently with the International Nutrition Congress for several years now, stands as a pivotal scientific event in the field of nutrition science within our country and the broader region. During this gathering, researchers, scientists, and policy-makers come together to share their latest scientific discoveries and experiences related to food and nutrition.

The alarming rise in non-communicable diseases in Iran and other countries underscores the critical need for lifestyle modifications, including dietary choices. Equally important is imparting healthy habits to our children and future generations. Unfortunately, our century bears witness to devastating wars, mass displacement, and environmental crises, all of which magnify the challenges surrounding nutrition and health.

Addressing these challenges requires the collective empathy, consultation, and resourcefulness of experts from diverse backgrounds: nutrition, agriculture, environment, economics, and policy-making. I sincerely hope that this congress will serve as a platform for such collaboration.

The theme of this year's congress is "**Achievement and Challenges in the Food and Nutrition System: Approaching New Horizons.**" This theme underscores the pivotal role of nutrition in enhancing overall quality of life. Sustainable nutrition encompasses not only dietary practices but also factors like sustainable agriculture and a robust economy. Inter-sectoral and international collaborations are essential for establishing sustainable nutrition practices that positively impact people's well-being. As we convene, let us remain steadfast in our pursuit of innovative approaches to promote health and genuine happiness among our communities.

Sincerely,



**Dr. Alireza Zali**

**Chancellor of the Shahid Beheshti  
University of Medical Sciences | President  
of the Congress**

Greetings to our colleagues and friends, both near and far.

After a significant hiatus since our last gathering, largely due to the pandemic, we are increasingly excited as we approach the 4th International and 16th Iranian Nutrition Congress in Tehran, Iran. The congress theme is "Achievements and Challenges in Food and Nutrition System: Approaching toward New Horizons." It is my privilege to extend this invitation to all of you for this scientific event.

This congress presents a valuable opportunity for scientists and health professionals to exchange knowledge and expertise in the realms of food and nutrition sciences. We have endeavored to encompass all facets of nutrition, from the cellular level to society at large. The program includes keynote addresses, plenary and scientific lectures, symposia, and roundtable discussions. Researchers and students are encouraged to present their latest scientific discoveries through posters or brief oral presentations.

I eagerly anticipate our gathering at the 4th International and 16th Iranian Nutrition Congress. I am confident that you will not only benefit from the event but also appreciate Iranian hospitality, culture, and cuisine.



## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress



**Dr. Jalaleddin Mirzaei Razaz, MD, Ph.D.**

Vice President of the Congress and  
president of Iranian Nutrition Society

### **Dear colleagues and friends**

We have the honor to announce that the 4th International and 16th Iranian Nutrition Congress, scheduled to take place at the Shahid Beheshti International Conferences Center, Tehran, Iran on 21 to 23 February 2024.

The theme of the congress is **“Achievements and Challenges in food and Nutrition system: Approaching toward new Horizons”** to emphasize the goal of food and nutrition scientific community, which is the improvement of the quality of life through a healthy nutrition.

The event will provide an excellent opportunity for interaction among experts in nutrition, food and related disciplines from USA, Europe, Asia and Canada and exchange their knowledge and expertise in these areas and its application to promote the health of populations.

This year and in this congress we hope to face successful events, because it will be well-attended by relevant nutrition and health stakeholders, policy-makers and planners, and food and nutrition faculty members from many universities in the country.

The total number of participants (including students) is expected to be around 2000 this year. Location and facilities of Shahid beheshti International Conferences Center provides an opportunity for colleagues and students to come together in a pleasure space. Looking forward to meeting you in Tehran.

Yours sincerely,



**Dr. Amir M. Mortazavian**

Director of National Nutrition and Food  
Technology Research Institute Dean of Faculty  
of Nutrition Sciences and Food Technology

### **The close relationship between nutrition and food technology**

‘Human nutrition’ is the science of food fate in the body and its relationship with the health. The area of nutrition starts from cellular nutrition, followed by clinical nutrition and ended in larger scale, to the community nutrition in different aspects of public health. ‘Food technology’ comprises the operationalization and commercialization of nutrition and food science facts in the form of food matrices and products.

Although in an initial view, the ‘nutrition’ and ‘food technology’ fields are separate and distinct professions, however, food technology is along the nutrition. In fact, while a food matrix with satisfactory nutritional and health considerations as well as fair price is rationally expected, the food technology must design and develop it according to the principles of nutrition sciences. Therefore, without close relationship and collaboration between the food technologists and nutritionists, the community would be deprived from healthy and tasty foods with fair prices.

In parallel with its instinct vision and mission, the ‘National Nutrition and Food Technology research Institute’ (NNFTRI) with the experience more than 62 years, has been being tried and attempted to accomplish this important and substantial issue in the country and to bind the food guilds and industries with universities and research centers in this regard.

In this congress, a symposium entitled ‘Food technology and public health: policy making, manufacturing and regulations’ was defined with aforementioned wide viewpoint and goals.



## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress



**Dr. Majid Hajifarji**

Congress Scientific Secretary

### **In the name of God,**

We express our gratitude for the opportunity to host the 4th International Congress and the 16th National Congress of Iranian Nutrition from February 21st to 23rd. The event will take place at the International Conference Center of Shahid Beheshti University in Tehran. After a delay of several years, we take immense pride in bringing together esteemed professors, experts, researchers, and students from various fields, including nutrition sciences, the food industry, biotechnology, and related medical and non-medical disciplines.

The science of nutrition, with its diverse trends, is intricately linked to various domains, including medical sciences. It plays a pivotal role in establishing a sustainable system that enhances food security, nutrition, and public health—all critical pillars of our nation's security. During this congress, we will delve into the challenges and achievements of the food and nutrition system. Our focus will extend to exploring new horizons, examining governance, management, and policy aspects of this system, and introducing knowledge-based technologies for production, provision, and access to sufficient, healthy, and safe food.

Additionally, our discussions will encompass strategies for reducing the burden of both communicable and non-communicable diseases. We will address the impacts of climate change and explore the intricate interrelationship between nutritional status and social, psychological, and spiritual well-being. Furthermore, we aim to promote food and nutrition culture and literacy, along with innovative methods of education at both the community and university levels.





**Dr. Azizollah Zargaran**

Congress Executive Secretary

The 4th International and the 16th National Nutrition Congress, this eternal legacy that has come to us from the ancestors and the founders of nutrition science in Iran, by the grace of God, will be held on February 21 to 23, at the Abureyhan International Conference Center, Shahid Beheshti University.

Holding this congress, after several years of the coronavirus pandemic, is of special importance. In the last few years, after the coronavirus pandemic, which was the source of tremendous developments and changes at the national and international level, the world of nutrition also underwent a transformation, and therefore we decided to organize this event, which has been held for more than 15 years.

In 2024, we will hold it as a review of the achievements and challenges in the food and nutrition system and with a view to new horizons. The use of young researchers and experts along with experienced professors in the composition of the scientific and executive committees of the Congress, as well as the selection of practical topics in round tables, symposiums and lectures, have been among the most important activities carried out in the course of holding this Congress. It is hoped that the results of this congress will show its effects on food and nutrition policies, the position of nutrition science in the health system and improve the nutritional status of society.



## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress

### Steering Committee

*Alphabetical Order*

Dr Azizi Fereidoon	Research Institute for Endocrine Sciences, SBMU
Dr Davoudi Seyyed Hossein	School of Nutrition Sciences and Food Technology, SBMU
Dr Farshidi Hossein	Ministry of Health and Medical Education
Dr Ghane'ei Mostafa	Vice-Presidency for Science, Technology and Knowledge-based Economy
Dr Hajifaraji Majid	National Nutrition and Food Technology Research Institute
Dr Kalantari Naser	School of Nutrition Sciences and Food Technology, SBMU
Dr Larijani Bagher	Research Institute for Endocrine Sciences, TUMS
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Dr Rahmati Roodsari Mohammad	Shahid Beheshti Univ. of Medical Sciences
Dr Zaali Alireza	Shahid Beheshti Univ. of Medical Sciences

### Scientific Committee

*Alphabetical Order*

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Dr Alipour Beytollah	Tabriz Univ. of Medical Sciences
Dr Amani Reza	Isfahan Univ. of Medical Sciences



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Dr Bazhan Marjan	School of Nutrition Sciences and Food Technology, SBMU
Dr Davoudi Seyyed Hossein	School of Nutrition Sciences and Food Technology, SBMU
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Dr Giahi Ladan	Avicenna Center or Infertility
Dr Hadaegh Farzad	Research Institute for Endocrine Sciences, SBMU



## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress

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Dr Hassangomi Majid	Ministry of Health and Medical Education
Dr Homayounfar Reza	National Nutrition and Food Technology Research Institute
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Dr Javanbakht MohammadHassan	Tehran Univ. of Medical Sciences
Dr Javdan Gholamali	Hormozgan Univ. of Medical Sciences
Dr Jazayeri Shima	Iran Univ. of Medical Sciences
Dr Kalantari Naser	School of Nutrition Sciences and Food Technology, SBMU
Dr Karajibani Mansoor	Zahedan Univ. of Medical Sciences
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Dr Kelishadi Roya	Isfahan Univ. of Medical Sciences
Dr Khosravi-Darani Kianoosh	National Nutrition and Food Technology Research Institute
Dr Kooshki Mohammadreza	National Nutrition and Food Technology Research Institute
Dr Larijani Bagher	Research Institute for Endocrine Sciences, TUMS
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Dr Mahdavi Reza	Tabriz Univ. of Medical Sciences
Dr Mahdavi Roshan Marjan	Gilan Univ. of Medical Sciences
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Dr Mardani Mahnaz	Lorestan Univ. of Medical Sciences
Dr Mazloomi Seyyed Mohammad	Shiraz Univ. of Medical Sciences
Dr Mehdizadeh Atiyeh	Mashad Univ. of Medical Sciences
Dr Mesghar Tehrani Majid	Pasteur Institute of Iran
Dr Milani-Bonab Ali	National Nutrition and Food Technology Research Institute



Dr Mirmiran Parvin	School of Nutrition Sciences and Food Technology, SBMU
Dr Mirzay Razaz Jalaeddin	School of Nutrition Sciences and Food Technology, SBMU
Dr Mofid Vahid	School of Nutrition Sciences and Food Technology, SBMU
Dr Mohammadi Mohsen	Shiraz Univ. of Medical Sciences
Dr Mohammadi-Nasrabadi Fatemeh	National Nutrition and Food Technology Research Institute
Dr Mortazavian A.Mohammad	School of Nutrition Sciences and Food Technology, SBMU
Dr Motlagh Mohammad-Esmaeil	Supreme Council for Health and Food Security
Dr Movahedi Ariyo	Science and Research Branch, IAU
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Dr Najarzadeh Azadeh	Shahid Sadoughi Univ. of Medical Sciences
Dr Nemati Mohsen	Mashad Univ. of Medical Sciences
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Dr Nikooyeh Bahareh	National Nutrition and Food Technology Research Institute
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Dr Razeghi Soodeh	School of Nutrition Sciences and Food Technology, SBMU
Dr Sabooni Mehdi	-
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Dr Safavi Seyed Morteza	Isfahan Univ. of Medical Sciences
Dr Salehi Moosa	Shiraz Univ. of Medical Sciences
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Dr Shahraki Mansoor	Zahedan Univ. of Medical Sciences



## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress

Dr Shahrjerdi Alireza	Arak Univ. of Medical Sciences
Dr Sharifi Nasrin	Kashan Univ. of Medical Sciences
Dr Sheykholeslam Robabeh	Ministry of Health and Medical Education
Dr Sobouti Behnam	Iran Univ. of Medical Sciences
Dr Sohrabvandi Sara	National Nutrition and Food Technology Research Institute
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Dr Takian Amirhossein	Tehran Univ. of Medical Sciences
Dr Tarighat Esfanjani Ali	Tabriz Univ. of Medical Sciences
Dr Torabi Parisa	Ministry of Health and Medical Education
Dr Zand Hamid	School of Nutrition Sciences and Food Technology, SBMU
Dr Zargaran Azizollah	National Nutrition and Food Technology Research Institute

### Executive Committee

*Alphabetical Order*

Ahmadigol Adel	School of Nutrition Sciences and Food Technology, SBMU
Amin Neda	-
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Homayoufar Reza	National Nutrition and Food Technology Research Institute
Iravani Orod	IFMARC
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Majid Hajifarji	National Nutrition and Food Technology Research Institute
Milani-Bonab Ali	National Nutrition and Food Technology Research Institute
Momeni Aref	Semnan Univ. of Medical Sciences
Neyestani Tirang	National Nutrition and Food Technology Research Institute
Zargaran Azizollah	National Nutrition and Food Technology Research Institute



## Executive Team

### *Alphabetical Order*

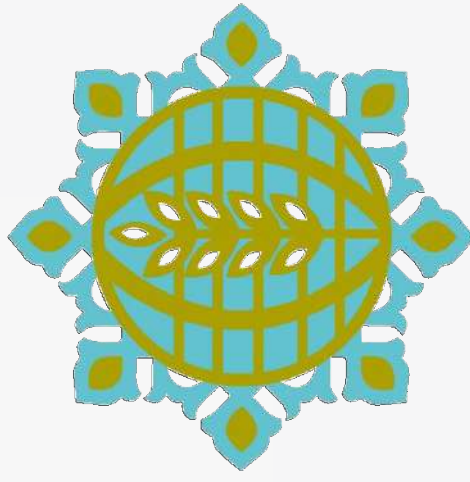
Abbas-Pasha OmidReza	Shahid Beheshti Univ. of Medical Sciences
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Ahmadnezhad Salaheh	Shahid Beheshti Univ. of Medical Sciences
Alem Emad	Qazvin Univ. of Medical Sciences
Asbaghi Omid	Shahid Beheshti Univ. of Medical Sciences
Assadi Ali	Shahid Beheshti Univ. of Medical Sciences
Assari Sajjad	Baghiyatallah Univ. of Medical Sciences
Baghernia Nima	Science and Research Branch, IAU
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Behnoodfar Shadi	Shahid Beheshti Univ. of Medical Sciences
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Javanshir Zahra	School of Nutrition Sciences and Food Technology, SBMU
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Katanbaf Nezhad Marzieh	Science and Research Branch, IAU
Keshtkar Nasrin	Iran Univ. of Medical Sciences
Khorshidi Raheleh	Iranian Nutrition Society



## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress

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Mohammadi Fatemeh	Shahid Beheshti Univ. of Medical Sciences
Mohammadi Parisa	Shahid Beheshti Univ. of Medical Sciences
Mozafari Fatemeh	Iran Univ. of Medical Sciences
Mozaffari Shima	Science and Research Branch, IAU
Mozaffari Shima	Science and Research Branch, IAU
Mozhda Rahmani	Shahid Beheshti Univ. of Medical Sciences
Naghash Zadeh Motahareh	Tehran Univ. of Medical Sciences
Naghavi Marjan	Shahid Beheshti Univ. of Medical Sciences
Navvab Motahhareh	Shahid Beheshti Univ. of Medical Sciences
Noori Farnaz	Qazvin Univ. of Medical Sciences
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Rezvani Soroush	Iran Univ. of Medical Sciences
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Samadi Zahra	Tehran Univ. of Medical Sciences
Shahabi Nejad Shabnam	School of Nutrition Sciences and Food Technology, SBMU
Sheikhhossein Fatemeh	Tehran Univ. of Medical Sciences
Shirzadi Ayyoub	Shahid Beheshti Univ. of Medical Sciences
Shoja' Siahi Maryam	Tehran Univ. of Medical Sciences
Taherinia Sorour	Isfahan Univ. of Medical Sciences
Zamani Behzad	Tehran Univ. of Medical Sciences
Zarook Hossein	Shahid Beheshti Univ. of Medical Sciences
Ziaeeian Yazdinejad Narges	School of Nutrition Sciences and Food Technology, SBMU





چهارمین کنگره بین المللی و  
شانزدهمین کنگره تغذیه ایران

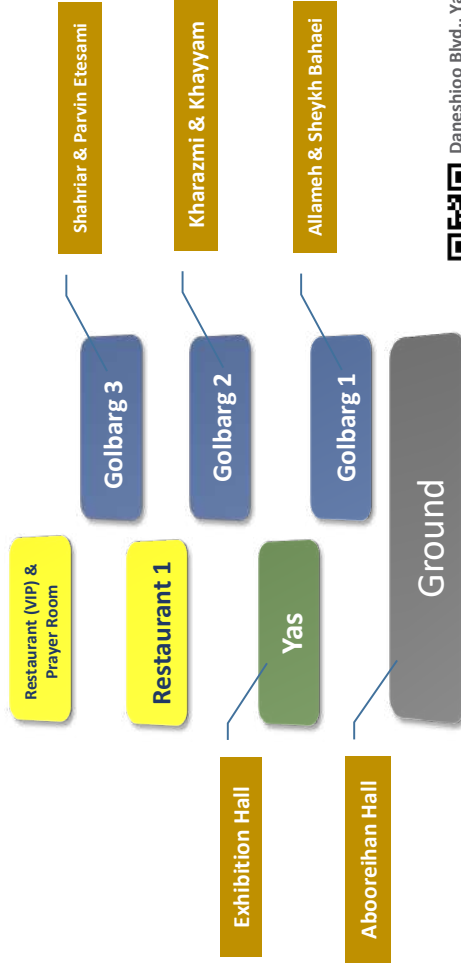
The 4<sup>th</sup> International  
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۲ تا ۴ اسفند ۱۴۰۲  
تهران- ایران

21- 23 February 2024  
Tehran, Iran



# Venue Information



Daneshjoo Blvd., Yaman St.  
Chamran Exp. Way, Shahid  
Beheshti International Conferences  
Center, Tehran, Iran



The 4<sup>th</sup> International  
and 16<sup>th</sup> Iranian Nutrition  
Congress

چهارمین کنفرانس بین‌المللی  
شانزدهمین کنفرانس تغذیه ایران

Program at a Glance		
Time	Day 1 (Feb. 21)	
	Day 2 (Feb. 22)	
8:00-10:00	Day 3 (Feb. 23)	
10:00-10:30	Day 2 (Feb. 22)	Day 3 (Feb. 23)
10:30-12:30	Day 2 (Feb. 22)	Day 3 (Feb. 23)
12:30-14:00	Day 2 (Feb. 22)	Day 3 (Feb. 23)
14:00-16:00	Day 2 (Feb. 22)	Day 3 (Feb. 23)
16:00-16:30	Day 2 (Feb. 22)	Day 3 (Feb. 23)
16:30-18:30	Day 2 (Feb. 22)	Day 3 (Feb. 23)
18:30-20:30	Day 2 (Feb. 22)	Day 3 (Feb. 23)

- Keynote Address
- Plenary Lectures
- Scientific Lectures
- Symposiums
- Round Tables
- Oral Communications
- Workshops

# 1-12 SYMPOSIUMS

Symposiums	
<b>day1</b>	Governance, Stewardship & Policy-making in the Food & Nutrition System
	Nutritional Care in Hospitals
	Future Studies in Food & Nutrition System
	Food Technology and Public Health: Policy Making, Manufacturing and Regulations
	Diet, Gut Microbiome & Health
<b>day2</b>	Climate Change & Food & Nutrition Security
	Mother and Child Nutrition
	Nutrition in Psychological & Spiritual Health
	Physical Activity, Sports Nutrition & Public Health
	Personalized Diet, Epigenetics, Nutrigenomics & Nutrigenetics
	Supplements & Health Challenges
<b>day3</b>	Nutrition & Non-Communicable Diseases

# 1-10 ROUND TABLES

Round Tables	
<b>day1</b>	Compulsory Community Service for nutritionists: Opportunities & Challenges
	Standardization of Body Shaping Technologies: Challenges and Solutions
	Evidence based Policy-Making Challenges in Iranian Food & Nutrition System
	Culture and Health Literacy in National Policy Statement of Food & Nutrition Security
<b>day2</b>	Colored-Food Labeling in Iran: Is it Suitable for the Iranian Public?
	Clinical Nutrition in National Health System
	Insurance Coverage of Nutritional and Diet Therapy Services
	Human Resource Training for Sustainable Food & Nutrition System
	Capacities of food tourism Development in Iran
<b>day3</b>	Non-Invasive Technologies for Body Shaping



**Day 1**

**February 21**





February 21		
Time	Program	Speaker
8:00-10:00	Registration and Opening Ceremony	
10:00-10:30	Coffee Break	
10:30-12:30	Food Systems Transformation & Nutritional Sustainability: Global Trends, national Perspectives	Prof. Amirhossein Takian
	Current perspectives in the treatment of obesity	Prof. Reza Malekzadeh
12:30-14:400	Lunch Break	

**Keynote**

## February 21

Abooreihan Hall 650	
<p><b>Panel:</b> Dr. Abdolreza Norouzy (Chair), Dr. Siavash Babajafari, Dr. Alireza Ostad-Rahimi, Dr. Mehdi Shadnough, Dr. Gholamreza Farsani, Dr. Mohammad Safarian</p>	
Malnutrition in Hospitals	Dr. M. Safarian
Omega 3 Fatty Acids in Cardiovascular Diseases	Dr. M. Shahraki
Weight loss and physiological status of micronutrients	Dr. OstadRahimi
Nutrition consultation for 18 disease groups in the hospital	Dr. S. Babajafari
Nutrition Care in ICU	DR. G. Farsani
Nutritional Care in Hospitals	
Allameh Tabatabaeei Hall 150	
<p><b>Panel:</b> Dr. Majid Hajifaraji (Chair), Prof. Amirhossein Takian, Dr. Fatemeh Mohammadi Nasrabadi, Dr. Arezoo Haghghian, Dr. Ali Milani Bonab</p>	
Strengthening Collaborative Governance for Sustainable Nutrition Policy: the Role of Social Network Analysis	Prof. Takian
Food and nutrition security documents in Iran: lessons learned and future directions	Dr. Nasrabadi
Addressing Food Security Challenges in the Face of Sanctions and Post-COVID-19 Realities: A Comprehensive Approach	Dr. Jalal Hejazi
Policy Recommendations for Food and Nutrition System Stewardship and Governance Integration	Dr. Ali Milani
Nutrition System Policy-making in the Food & Governance, Stewardship & Integration	
14:00-16:00	
Coffee Break	
16:00-16:30	

# Symposiums



**February 21**

**Kharazmi Hall**



150

**Panel:** Prof. Mostafa Ghane'ei (Chair), Dr. Shahram Towfighi, Dr. Behnam Honarvar, Dr. Hassan Mozaffari, Dr. Morteza Abdollahi

**Symposium**

14:00-16:00

16:00-16:30

Future Studies in Food & Nutrition System

Future Studies System in Nutrition

A Futuristic Global Perspective on Nutrition

Children's Anthropometric Indices and Their National Trends

Dr. Shahram Towfighi

Prof. Mostafa Ghane-ei

Prof. M. Abdollahi

Coffee Break

February 21

Shahriar Hall



Panel Moderator: Dr Jaleddin M. Razzaz

Compulsory Community  
Service for nutritionists:  
Opportunities & Challenges

14:00-16:00

**Panelists:**

Representative of Human Resource Department, Ministry of Health and Medical  
Education:

Dr. Omid Fathi, Dr. Saeid Changizi Ashtiani and Ms. Elaheh Rasouli

Representative of Students and Graduates on Nutrition Sciences

16:00-16:30

Coffee Break

**Round Table**

Speaker	Title
Alboebadi Roghayeh	Panel: Dr Reza Homayounfar, Dr Matin Ghanavati, Dr. Ghazaleh Eslamian, Dr Mahdiyeh Golzarand, Dr Nasrin Sharifi The Effect of Low-calorie, Low-carbohydrate Raisin Containing Diet on Liver Enzymes, Liver Steatosis Grade, Inflammatory and Oxidative Stress Biomarkers in Non-alcoholic Fatty Liver Disease Patients
Barghchi Hanieh	Effects of Pomegranate (Punica Granatum L.) Peel Extract on Metabolic Syndrome Risk Factors in Non-alcoholic Fatty Liver Disease Patients: A Randomized Double-blind Clinical Trial
Doagoo Alireza	Medium-chain Triglycerides Exert Hepatoprotective and Therapeutic Effects in NAFLD-induced Rats By Improving Lipid Metabolism and Preventing Inflammatory Responses Through Recruiting Phosphorylated AMPK
Razmpour Farkhondeh	Chinese Visceral Adiposity Index: A Novel Tool for Screening Liver Fibrosis and Steatosis; A Cross-sectional Study
Arefhosseini Sara	Improved Lipid Profile and LDLR Gene Expression Following Myo-inositol Supplementation in Obese Patients with Nafid: A Double-blind Placebo-controlled Randomized Clinical Trial
Bavi Behbahani Hossein	Association of Malnutrition-inflammation Score With Metabolic Parameters, Interdialytic Weight Gain, Uremic Pruritus, Sleep Quality, Mental Health, And Quality of Life in Maintenance Hemodialysis Patients
Faghfour Amir Hossein	Immunomodulatory, Anti-inflammatory, Antioxidant and Clinical Responses to Zinc Gluconate Supplementation in Patients with Behcet's Disease: A Randomized, Double-blind, Placebo-controlled Clinical Trial
Mirmajidi Susan	How Are Dietary Patterns Associated with Dietary Inflammatory Index, Systemic Inflammation, and Insulin Resistance in Apparently Healthy Individuals with Obesity?

**Coffee Break**



Parvin Etesami Hall

## February 21

Allameh Tabatabaee Hall



150

**Panel:** Dr. Amir M. Mortazavian (Chair), Dr. Faramarz Khodaian, Dr. Koushan Nayebezhadeh, Dr. Vahid Mofid, Dr. Nabi Shariatifar, Dr. Azizollah Zargaran

Food Technology and Public Health: Policy Making, Manufacturing and Regulations

16:30-18:30

# Symposium

Enrichment Strategies of Food Products in Iran

Dr. Tirang Neyestani

Food Safety Regulatory Strategies and Challenges in Food Industries

Dr. Mahmood Ale-Booyeh

Food Guilds and Public Health: Concerns, Challenges and the Relevant Regulations

Dr. Jafar Jandaghi

Role of Nano emulsion in food safety (Threat or Opportunity for Organic Food?)

Dr. Hamed Ahari

February 21	
<p><b>Round Tables</b></p> <p>16:30-18:30</p>	<p><b>Abooreihan Hall</b> 650</p> <p><b>Panel Moderator:</b> Dr. Majid Hassangomi</p> <p><b>Panelists:</b>                      Dr. Amirhessam Alirezaei,                      Dr. Seyed Moosa Tabatabaei,                      Dr. Freshteh Torabi,                      Dr. Nasrin Bayat,                      Dr. Sanaz Bakhshandeh,                      Dr. Nafiseh Goudarzi-zadeh,                      Dr. Maryam Javadi,                      Dr. Abdolreza Norouzy,                      Dr. Saeid Hadi,                      Dr. Mohammadreza Jalilvand</p> <p>Standardization of Body Shaping Technologies: Challenges and Solutions</p>
<p><b>Khazami Hall</b> 150</p> <p><b>Panel Moderator:</b> Dr. Zahra Abdollahi</p> <p><b>Panelists:</b>                      Dr. Mohammad Esmaeil Motlagh,                      Dr. Ali KianiRad,                      Prof. Naser Kalantari,                      Dr. Zahra Ghayoumi,                      Dr. Zahra Farzaneh                      Dr. Ali Milani-Bonab,                      Dr. Shirin Seyyed Hamzeh                      Dr. Mona Pourghaderi</p> <p>Evidence based Policy-Making &amp; Challenges in Iranian Food &amp; Nutrition System</p>	

## February 21

Speaker	Title
Alijani Sepideh	Panel: Dr Marjan Bazhan, Dr Samira Rabiei, Dr Hoda Derakhshanian, Dr. Atoosa Saeidpour Investigating The Predominant Dietary Pattern in Hashimoto's Thyroiditis Patients in the Iranian Adult Population, A Case-control Study
Salehi Ammar	Association of Diet Diversity Score with Primary Insomnia: A Case-control Study
Barkhidarian Bahareh	Association Between Plant-based Diet Index and Appetite-regulating Peptides: A Cross-sectional Study on Iranian Female Adults
Ansari Shakila	Ultra Processed Foods Increases The Risk of Premature Coronary Heart Disease
Bazhan Marjan	Willingness of Iranians to Pay for Organic Foods: Egoistic or Altruistic Motivations
Dehghani Kari Bozorg Azadeh	Nutrient Profile Models' Application to Food Advertisements and Food Marketing Via Television for Children: A Systematic Review
Behroozi Farde Mogaddam Azra	Relationship Between Body Composition and Bone Density in Postmenopausal Women With Primary Osteoporosis
Mojtaba Nasiri	Oral Formulation of New Peptide: Innovative approach for Metabolic syndrome and diabetes

90



Shahrivar Hall

16:30-18:30

### Oral Communications

Speaker	Title
Dolatkhah Neda	Panel: Dr Neda Dolatkhah, Dr Nazanin Moslehi, Dr Hoda Zahedi The Effect of Probiotic Saccharomyces Boulardii Supplementation on Some Clinical and Para-clinical Findings of Patients With Multiple Sclerosis
Moradi Sajjad	Effects of Spirulina (Arthrospira Platensis) Supplementation on Disease Activity, Bowel Habits, Antioxidant Status, and Serum Pentraxin 3 Levels in Patients With Ulcerative Colitis: A Double-blind, Placebo-controlled Randomized Trial
Abbasi Mobarakeh K.	The Association Between Dietary Polyphenol Intake and Attention-deficit Hyperactivity Disorder: A Case-control Study
Hosseini Razieh	The Impact of Zinc Supplementation on Galectin-3 and Metabolic Markers in Diabetic Patients on Hemodialysis: A Randomized, Double-blind, Placebo-controlled Trial
Jowshan Mohammadreza	Effects of Synbiotic Yogurt Consumption on Metabolic Parameters, Oxidative Stress, Atherogenic Risk Factors, Inflammation and Gene Expression of Lipid Metabolism Indicators in Adults With Metabolic Syndrome: A Randomized Clinical Trial
Firoozi Donya	The Effects of Post-biotic Butyrate Supplementation on the Expression of Clock and BMAL1 Genes in Patients with Active Ulcerative Colitis: A Double-blind Randomized Controlled Trial
Moslehi Nazanin	Individual and Combined Associations of Macronutrient Quantity and Quality With the Incidence of Type 2 Diabetes
Mousavi Reihaneh	A Double-blind, Placebo-controlled Trial Related to The Effects of Melatonin And/OR Magnesium on Oxidative Stress and Inflammatory Parameters of Women with Polycystic Ovary Syndrome
Zahedi Hoda Sadat	Association Between Nutritional Status and Biochemical Markers among Hematopoietic Stem Cell Transplant Candidates: A Cross-sectional Study

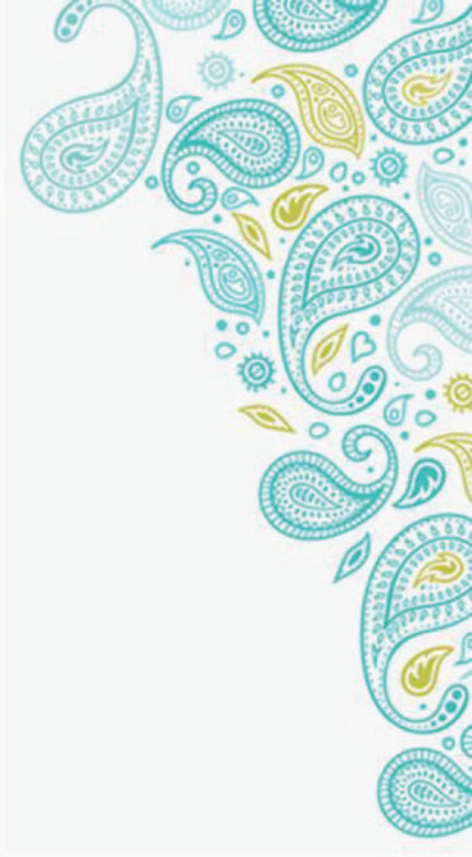
75  Parvin Etesami Hall

**Oral Communications**  
16:30-18:30



**Day 2**

**February 22**





Scientific Lectures		February 22	
8:00-10:00		Title	Speaker
Allameh Tabatabaee Hall 150		Panel Chair: Dr Mehdi Shadnough	
		The Nutritional Status of Hospitalized Patients in Hospitals	Dr. Abdloreza Norouzy
		Nutrition, Diet and Burden of Cancer	Prof. Mohammad Esmail Akbari
		Standard of Nutrition Services for Patients in the Hospital	Dr. Mohammad Safarian
		GLIM as a local adapted global tool for malnutrition screening in hospitals	Prof. Tommy Cederholm
10:00-10:30		Coffee Break	

## February 22

90 Shahriar Hall	Title	Speaker	Language
8:00-10:00	<b>Panel Chair:</b> Dr Mohammad Esmail Motlagh		
	Food and Nutrition Surveillance: The Main Strategy to Eradicate Malnutrition and Cellular Hunger	Prof. Tirang Neyestani	Fa
	Nutritional Support Programs for Vulnerable Social Groups	Dr. Kobra Eghtedary	En
	Iranian Optimum Food Basket	Dr. Fatemeh Mohammadi	Fa
	Changes in Food Security in Society During the COVID-19 Pandemic	Dr. Majid Hajifaraji	Fa
10:00-10:30	Coffee Break		

## Scientific Lectures

**February 22**

Symposiums		08:00-10:00		10:00-10:30	
Diet, Gut Microbiome & Health		Climate Change & Food & Nutrition Security		Coffee Break	
Abooreihan Hall		Parvin Etesami Hall		75	
650		650		75	
Panel: Prof. Bagher Larjani (Chair), Dr Hossein Davoudi, Dr Maryam Tajabadi, Dr Homayoun Moradi, Dr Behnam Sobouti		Panel: Dr. M. Esmail Motlagh (Chair), Dr Hamidreza Aghababaeian, Dr Abbas Taghizadeh, Dr Ramesh Allipour, Dr Fatemeh Esfarjani		Panel: Dr. M. Esmail Motlagh (Chair), Dr Hamidreza Aghababaeian, Dr Abbas Taghizadeh, Dr Ramesh Allipour, Dr Fatemeh Esfarjani	
Probiotics, next-generation probiotics and postbiotics for management of obesity and its associated complications		Climate Change and Risk of Morbidity		Climate Change and Risk of Morbidity	
The role of human microbiome in health and diseases		The effect of climate changes on food and nutrition security		The effect of climate changes on food and nutrition security	
Engineered probiotic: current status and future perspective		Change in Diet and increased risk of Cancer		Change in Diet and increased risk of Cancer	
Food-derived Exosomes and disease management		Food Security under Climate change Governance in Iran		Food Security under Climate change Governance in Iran	
Dietary advanced glycation end products (AGE) and gut microbiota interaction in health and disease		Food Security under Climate change Governance in Iran		Food Security under Climate change Governance in Iran	
Dr. H. Ejtahed		Dr. A. Taghizadeh		Dr. A. Taghizadeh	
Prof. B. Larjani		Dr. A. Taghizadeh		Dr. A. Taghizadeh	
Dr. H. Davoudi		Dr. A. Taghizadeh		Dr. A. Taghizadeh	
Dr. M. Sobouti		Dr. A. Taghizadeh		Dr. A. Taghizadeh	
Dr. M. Moradi		Dr. A. Taghizadeh		Dr. A. Taghizadeh	
Dr. M. Allipour		Dr. A. Taghizadeh		Dr. A. Taghizadeh	
Dr. M. Esfarjani		Dr. A. Taghizadeh		Dr. A. Taghizadeh	

## February 22

<p><b>Round Table</b></p>		<p>8:00-10:00</p>	<p>Culture and Health Literacy in National Policy Statement of Food &amp; Nutrition Security</p>	<p><b>Panelists:</b> Dr. Majid Saffarina, Dr. Fazlolah GhofraniPour, Dr. Abbas Ghanbari Baghestan, Dr. Nastaran Keshavarz Mohammadi, Dr. Majid Hassanghomi,</p>	<p>Panel Moderator: Dr Farshid Rezaei</p>	<p>Kharazmi Hall</p>	<p>150</p>

## February 22

Plenary Lectures		Aboreihan Hall		650	
10:30-12:30		12:30-14:00		Lunch Break	
Title	Speaker	Language			
Panel: Dr Hossein Davoudi, Dr Nastaran Keshavarz, Dr Amir M. Mortazavian					
Food Loss and Waste: Challenges and Opportunities	Dr Hossein davoudi	Fa			
Sustainable Food and Nutrition System	Dr Nastaran Keshavarz	Fa			
Functional foods and public health: past, present and future	Dr. Amir M. Mortazavian	Fa			
Milk and Health	Prof. Walter Willet	En			

## February 22

### Kharazmi Hall

150

75

**Panel:** Prof. Naser Kalantari (Chair), Dr Jalaleddin Razzaz, Dr Ramin Heshmat, Dr Mehrangiz Ebrahimi, Dr Saeid Doaei, Dr Hossein Hajianfar

**Panel:** Prof. Shahin Akoundzadeh (Chair), Dr Bahareh Fakhraei, Dr. Foroughan, Dr. Reza Amani, Dr. Maryam Javadi

### Mother and Child Nutrition

### Nutrition in Psychological & Spiritual Health

MAHDAK mobile application

Increasing Awareness Among Households about the Vital Role of Nutrition for Mothers and Children in Food-Insecure Areas

Dr Nasrollahi

Dr. R. Heshmat

The Interplay Between Genetic Factors and Nutrient Intake in Unwanted Abortion

Dr Saeid Doaei

Nutritional Care in ADHD Children

Dr. M. Ebrahimi

Diet and Pregnancy Disorder

Dr Yahya Pasdar

Psychological factors effective in changing nutritional behavior

Dr. A. Akbartabar

Gut brain axis in neurological diseases

Dr. Reza Amani

Nutritional Care in Multiple Sclerosis

Dr. Maryam Javadi

Food Addiction

Dr. Atoosa Saeidpour

14:00-16:00

16:00-16:30

Coffee Break

## Symposiums

**February 22**

Allameh Tabatabaei Hall



**Panel:** Dr. Mohammad Hozouri (Chair), Dr. Towhid Seif Barghi, Dr. Orod Irvani, Dr. Zahra Alizadeh, Dr. Arman Ghorbani, Dr. Foad Asjodi, Dr. Majid Hassanghomi, Dr. Mohammad Samadi

Physical Activity, Sports Nutrition & Public Health

**Symposium**

14:00-16:00

16:00-16:30

Sport nutrition and exercise-induced mental fatigue	Dr. Foad Asjodi
The double edge sword of protein intake: longevity and muscle mass	Dr. Matin Ghanavati
The use of sports simulators in hypertrophy and improving body composition	Dr. M. Hassanghomi
Nutrition strategies for Sport tournaments	Dr. M. Hozouri
Nutrition tips for prevention and rehabilitation after sports injuries	Dr. Farshad Ghazalian

Coffee Break

## February 22

Round Tables		14:00-16:00		16:00-16:30	
<b>Shahriar Hall</b> 90	<b>Abooreihan Hall</b> 650	<b>Panel Moderator:</b> Dr. Arezoo Haghghian  <b>Panelists:</b> Dr. Azizollah Zargaran Dr. Masoomeh Moslemi Dr. Sareh Edalati Dr. Sadeghian Dr. Zohreh Pourahmad Dr. Seyyed Amin Yaghoubi	<b>Panel Moderator:</b> Dr. Abdolreza Norouzy  <b>Panelists:</b> Dr. Mehdi Shadnoosh Dr. Ali Tarighat Efsanjani Dr. Majid Hassangomi Dr. Atiyeh Mehdizadeh Dr. Gholamreza Frasani Dr. Mohammad Safarian Ms. Zahra Soltani Rezvandeh	<b>Colored-Food Labeling in Iran: Is it Suitable for the Iranian Public?</b>	<b>Clinical Nutrition in National Health System</b>
				<b>Coffee Break</b>	



**February 22**

<h1>Symposiums</h1>		16:30-18:30	
<b>Personalized Diet, Epigenetics, Nutrigenomics &amp; Nutrigenetics</b>		<b>Supplements &amp; Health Challenges</b>	
<b>Kharazmi Hall</b>		<b>Allameh Tabatabaeei Hall</b>	
150		150	
<p><b>Panel:</b> Prof. Dariush Farhood (Chair), Dr Hamid Zand, Dr Katayoun Pourvali, Dr Majid Mesghar Tehrani, Dr Ghazaleh Eslamian, Dr Mehdi Tutunchi</p>		<p><b>Panel:</b> Prof. Tiran Neyestani (Chair), Dr Amirhossein Jamshidi, Dr. Abbas Kebriaeizadeh, Dr. Foad Asjodi, Dr. Kaveh Khabiri, Dr. Majid Ghayour Mobarhan</p>	
Nutrigenomics & Nutrigenetics	Dr M. Mesghar	Herbal supplements for health promotion and as an adjunct treatment: Benefits and Hazards	Dr. A. Jamshidi
Personalized nutrition and Single Nucleotide Polymorphisms (SNPs)	Dr. K. Pourvali	Nutritional Supplements in Autoimmune Disease: Friend or Foe?	Dr. Kaveh Khabiri
Personalized Approach in Nutritional Management of Diabetes	Dr H. Derakhshanian	Nutritional Supplementation During Cancer Treatment	Dr. M. Ghayour Mobarhan
The Role of Personalized Nutrition: Unveiling the Truth about Weight Regain after Weight Loss Diets	Dr. G. Eslamian	Food Fortification as a Cost-Effective Strategy to Enhance Nutrition: Challenges, Limitations and Opportunities for the Future Path	Prof. Tiran Neyestani
		Protein supplements in sport nutrition proper use and safety considerations	Dr. Foad Asjodi

## February 22

Round Tables		16:30-18:30	
<b>A b o u r e i h a n H a l l</b>  650	<b>S h a h r i a r H a l l</b>  90	<b>Panel Moderator:</b> Dr. Mohammad-Hassan Abolhassani	<b>Panel Moderator:</b> Dr. Majid Hajifaraji
<b>Panelists:</b> Dr. Mahmoudeza Mohaghegh Dr. Shahram Ghaffari Dr. Mehdi Shadnoush Dr. Seyed Mousa Tabatabaei Dr. Naser Saravi Dr. Hannan Hajimahmoudi Dr. Farshid Abedi Dr. Hassan Araghizadeh Dr. Arasb Dabbagh Moghaddam Dr. Mossayeb Yazdani Representatives of Private Insurance Companies	<b>Panelists:</b> Dr. Mohammad-Javad Hosseinzadeh, Dr. Ahmad Broomand, Dr. Delaram Ghodsi, Dr. Ali Milani-Bonab,	Insurance Coverage of Nutritional and Diet Therapy Services	Human Resource Training for Sustainable Food & Nutrition System

**February 22**

Sheykh Bahaei Hall



45

**Panel Moderator:** Dr Naser Kalantari and Dr Ali Pezeshki

**Round Table**

16:30-18:30

Capacities of Food Tourism  
Development in Iran

**Panelists:**

Dr. Roshan Babaei Hemmati

Dr. Morteza Tale' Masouleh

Dr. Dr Hossein Dehghan Menshadi

## February 22

February 22		Speaker
Title		
Panel: Dr Samira Pourmoradian, Dr Jalal Hejazi, Dr Amin Mokari, Dr. Neda Ezzedin		
The Effects of Food Price Policies (Taxes And Subsidies) on Promoting Healthier Diet in Iranian Households and Cost- Effectiveness Analysis of the Policies		Mokari-Yamchi Amin
What are the Best Nutrition Policies to Prevent NCDs in Iran? An Expert's Opinion		Pourmoradian Samira
Analysis and Evaluation of The "Improving Nutrition of Rural and Tribal Women" Program in Rural Areas of Tehran Province, Iran		Ezzedin Neda
Effect of a Comprehensive Nutrition Education Program on Nutritional Behavior and Food Security of Female-headed Households Who Receive Welfare Support in Zanjan Province		Hejazi Jalal
Effective Diet in the Treatment of Leukemia: Study of Apoptosis Following the Effect of Cardamom Extract in AML Leukemia of Rats		Golian Nazanin
Body Mass Index, Dietary Fiber and Docosahexaenoic Acid Intake Predicts One-year Relapses in Multiple Sclerosis Patients: Using Machine Learning Models		Jafari Karegar Sahar
The Effect of Vitamin C Supplementation on Lipid And Lipoprotein Concentration of Hyperlipidemic Patients		Seif Zahra
Evaluation of the Relationship Between Malnutrition According o PNI and Inflammatory Factors (ESR-CRP-D Dimer) in Corona Hospitalized Patients in Hamadan in 2020-22		Vahidinia Aliasghar



Parvin Etesami Hall

16:30-18:30

Oral Communications



**Day 3**

**February 23**



## February 23

Scientific Lectures		Title	Speaker	Language
8:00-10:00		Panel Chair: Dr. Jalaleddin Mirzay Razzaz		
10:00-10:30		Coffee Break		
75		Parvin Etesami Hall		
		A Review on the National Policies of Improving Fruits and Vegetable Consumption	Dr. Naser Kalantari	Fa
		Insulin Resistance and Its Long-term Health Consequences	Dr. R. Homayounfar	Fa
		Principals of Healthy Bread for the Community	Dr. Zahra Abdollahi	Fa
		Tehran Lipid and Glucose Study: Nutritional Results	Dr Parvin Mirmiran	Fa

## February 23

Scientific Lectures		8:00-10:00	10:00-10:30
150		Khazami Hall	
<b>Panel Chair:</b> Dr Mohammad Hassan Abolhassani			
Metabolic Syndrome Status in the Iranian Community	Dr. Fereidoun Azizi	Fa	
Epidemiology and burden of Fatty Liver	Dr. Moayed Alavian	Fa	
Childhood Obesity: CASPIAN Cohort Study	Dr. Ramin Heshmat	Fa	
Nutritional Results of Persian Cohort	Dr Farid Najafi	Fa	
<b>Coffee Break</b>			

## February 23

Scientific Lectures		Title	Speaker	Language
8:00-10:00		Panel Chair: Dr Seyyed Ali Keshavarz		
10:00-10:30		Coffee Break		
Allameh Tabatabaee Hall		150		
		Food is medicine	Dr. Dariush Mozaffarian	En
		Nutrition's role in immunomodulation	Dr. Simin Meydani	En
		Nutritional interventions in type 2 diabetes management	Dr. Anthony Leeds	En
		Adipocyte Genotypes and its Role in Obesity	Dr M. Javad Hosseizadeh	Fa



## February 23

Shahriar Hall



Panel Moderator: Dr Marjan Ajami

### Round Table

8:00-10:00

Non-Invasive Technologies for  
Body Shaping

**Panelists:**

Dr. Majid Hassanghomi,  
Dr. Atoosa Saeidpoor,  
Dr. Shahab Shahabi,  
Dr. Farnaz Farsi,  
Dr. Saeid Doaei,  
Dr. Matin Ghanavati,

10:00-10:30

Coffee Break

## February 23

### Abooreihan Hall

650

**Panel:** Prof Fereidoun Azizi (Chair), Dr Zahra Bahadoran, Dr. Koroush Etemad, Dr. Reza Homayounfar, Dr. Mohsen Nemati, Dr. Mohammad Alizadeh

Nutrition & Non-Communicable Diseases

8:00-10:00

10:00-10:30

## Symposium

An Etiological Approach to obesity management

Dr. Mohsen Nemati

Practical clinical considerations of medical nutrition therapy in ischemic heart disease

Dr. M. H Sharifi

Effects of lifestyle factors on regression and progression of prediabetes: Findings of a 9-year follow-up in the Tehran Lipid and Glucose Study

Dr. Zahra Bahadoran

The effects of the type of consumed oil on neurological diseases

Dr. M. Alizadeh

The role of Vitamin D on Health and Diseases



Dr. M. Arabi

Coffee Break

## February 23

Plenary Lectures		Title	Speaker	Language
10:30-12:30	Aboreihan Hall 650	Panel: Dr Mohammad Eslami, Dr. Shahin Salehi, Dr. Tirang Neyestani	Dr. Mohammad Eslami	Fa
		Nutrition crisis and its impact on mothers and newborns		
		Critical role of clinical laboratories in public health and patient care, with a focus on nutrition surveys and nutritional biomarkers	Dr. Khosrow Adeli	En
		The D-Lightfully Controversial Vitamin D for Health from Birth until Death	Dr Michael Holick	En
		Physical activity in weight management	Dr Shahin Salehi	Fa
12:30-14:00		Lunch Break		





**Invited  
Speakers  
Abstracts**



## Milk and Health

Walter Willett  
MD DrPH

The dietary guidelines of many countries include recommendations to consume substantial amounts of dairy foods, often including three or more servings per day. The main rationale has been to provide adequate calcium intake for bone health. However, studies of calcium requirements have usually lasted only a few weeks, which can be seriously misleading, and we have long known that countries with little milk consumption and relatively low intakes of calcium have low rates of bone fractures. More recent prospective studies do not support a benefit of high dairy food consumption for fracture prevention. The role of dairy foods for overall health will depend strongly on the overall quality of the diet; when carbohydrate intake from starchy staple foods is very high, replacing some of these foods with milk or cheese can be beneficial. However, when the overall diet includes a diversity of healthy foods, such benefits may not be observed, and high dairy consumption may increase risk of prostate cancer and possibly other malignancies. Importantly, production of milk causes large amounts of greenhouse gases emissions, and global consumption of two or more servings per day would undermine efforts to limit climate change. Considering both health and environmental effects, a global target of approximately one serving a day of dairy foods is reasonable; if higher calcium intake is a goal, this can be provided by other foods, fortification, or supplements.



## Central Role of Laboratory Medicine in Patient Care and Nutrition Surveys

Prof Khosrow Adeli

Molecular Medicine and Clinical Biochemistry, The Hospital for Sick Children, University of Toronto

Clinical laboratories play a crucial role in nutrition surveys by providing accurate and reliable data on various biomarkers related to nutritional status. These surveys are essential for assessing the nutritional status of populations, identifying deficiencies or excesses in nutrient intake, and informing public health policies and interventions. Clinical laboratories analyze blood, urine, and tissue samples to measure levels of key nutrients, such as vitamins, minerals, and proteins, as well as indicators of metabolic health, like cholesterol and blood glucose levels. The data generated by these analyses help researchers and policymakers understand the prevalence and patterns of malnutrition, monitor trends over time, and evaluate the effectiveness of nutrition interventions. Additionally, clinical laboratories ensure the quality and standardization of measurements, which is essential for comparing data across different populations and studies. Overall, the insights provided by clinical laboratories are indispensable for promoting optimal nutrition and improving health outcomes on a population level.



## Food Loss and Waste: Challenges and Opportunities

Sayed Hossein Davoodi <sup>1</sup>, Meisam Barati <sup>2</sup>, Masoumeh Jabbari <sup>3</sup>

1. Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Department of Clinical Nutrition, National Nutrition and Food Technology Research Institute, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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According to the United Nations (UN) definition, food loss and waste (FLW) is defined as a reduction in quality or quantity in the food supply chain. In this definition, food loss is produced during the production, processing and distribution of foods, while food waste is produced at the level of retail and consumption. Also, in the UN definition, non-edible parts of foods are not considered as FLW. Reducing FLW has many beneficial effects on improving food security and reducing their environmental impact. Reports suggest that managing FLW can help combat malnutrition in the world. On the other hand, eight percent of the total greenhouse gases emission into the earth's atmosphere every year originate from FLW. Also, 25 percent of the world's agricultural water is used for food, which eventually loses or waste. FLW has different causes at different steps of the food supply chain. Also, different approaches to reduce food waste have been reported in each step. Solutions to reduce FLW are classified into three categories: prevention, recovery, and recycling. The solutions that are in the category of prevention, such as consumer education campaign, standardized date labeling, and waste tracking & analytics are the most economical methods. This is despite the fact that recycling solutions such as centralized composting and anaerobic digestion methods have higher diversion potential. The mentioned solutions for prevention and recycling categories also have more effects on greenhouse gases emission than their own group's solutions. Solutions including donation tax incentives, standardized donation regulation, and donation matching software in the recovery category have better effects in reducing greenhouse gases than their counterparts.

Keywords: Food loss and waste, consumer education campaign, composting, donation tax incentives.





## Exercise and weight management

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Exercise is a crucial factor in weight loss as it aids in burning calories and improving fitness. When combined with a balanced diet, exercise plays an even more significant role in weight loss. Regular exercise helps to burn calories, which is essential for weight loss.

**Step stability during exercise and weight loss:** Step stability is crucial for exercise and weight loss. To increase exercise consistency, by planning enjoyable workouts and finding activities that you like, you can increase exercise consistency. As your fitness level improves, gradually increase the intensity and duration of your exercises. If you are unable to continue exercising for any reason, you may not achieve your desired results.

**Burning calories:** Engaging in physical activity, such as aerobics, strength training, or even daily activities like walking or working out, can help burn calories. The more intense the activity or the longer a person spends doing it, the more calories they will burn.

**Cardiovascular exercises:** Cardiovascular exercises, such as running, swimming, cycling, or brisk walking, can increase the heart rate and calorie consumption during the activity. It is recommended to include at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity aerobic exercise per week.

**High-intensity interval training (HIIT):** is a form of exercise that involves short periods of intense exercise followed by short periods of rest. HIIT can be an effective way to burn calories and increase metabolism during and after exercise. HIIT sessions typically last 20-30 minutes. However, it may not be suitable for everyone and requires a certain level of physical fitness.

**Strength training:** Incorporating strength training exercises, such as weightlifting or using elastic bands, can help build lean muscle mass. This can increase your metabolism and help you burn more calories throughout the day, as muscle burns more calories at rest than fat.

**Other Advantages:** Exercise has numerous benefits beyond weight loss. It can improve cardiovascular health, increase strength and endurance, enhance mood, promote better sleep, and reduce the risk of chronic diseases. Additionally, exercise can improve lipid profile and lower blood sugar levels.

However, it is important to note that while exercise is crucial for weight loss, a proper diet is also necessary to achieve the desired weight. If you have chronic diseases or any conditions that may be worsened by exercise, it is important to consult a doctor before starting any new exercise program.



## The role of human microbiome in health and diseases

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As molecular science and technology interact, personalized healthcare is being transformed into precision healthcare. As an innovative holistic approach to providing a more comprehensive understanding of the molecular and physiological events underlying human diseases such as inflammatory and gastrointestinal diseases, neurological and psychiatric diseases and endocrine disorders including obesity, dyslipidemia, fatty liver, insulin resistance, diabetes and osteoporosis, the combination of multiple omics approaches has emerged.

Gut microbiota is composed of bacteria, archaea, phages, and protozoa which is now widely accepted that its interactions with metabolic processes have an impact on the pathophysiology of the host organism. Microbiome studies, along with proteomics, genomics, transcriptomics, and metabolomics, could be helpful for risk prediction, early diagnosis and better treatment of diseases. Moreover, a large number of studies have demonstrated that gut microbiota can modify the efficacy and toxicity of drugs. The prognostic, diagnostic, and therapeutic potential of the human gut microbiota is widely recognized. However, the translation of microbiome findings to clinical practice is challenging. The first step in developing potential therapies suitable for each endocrine disorder is to characterize the gut microbial populations. Intervention techniques to alter the diversity, composition and function of the gut microbiota including dietary interventions, probiotics, prebiotics, synbiotics and fecal microbiota transplantation have gained increasing attention throughout time. More recently, genetically modified bacteria have been employed as noninvasive tools in microbiome genetic engineering to assist available research and acquire insights into what could be happening in situ.

**Keywords:** microbiota, endocrine disorders, microbiome genetic engineering, omics



## Engineered probiotic: current status and future perspective

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A group of probiotics which called engineered probiotics (EPs) are produced from the manipulation of their proteome through the biotechnical methods. Recently, a potential role to treatment/management of chronic and congenital diseases has been proposed for EPs.

Preclinical studies have shown that the EPs can be a novel therapeutic approach for the management of Phenylketonuria (PKU) as a congenital disease. To specialize an EP for the treatment of PKU, the gene related to phenylalanine ammonia-lyase is transfected into a probiotic. So, the probiotic is enabled to catalyze phenylalanine content of food in the gut. Also, to enable a probiotic for hyperammonemia, as a manifestation for urea cycle disorders, the genes related to the alanine dehydrogenase and arginine biosynthetic enzymes are transfected. Other than congenital metabolic disorders, there are a vast number of preclinical studies to manage chronic diseases such as diabetes and cardiovascular disease (CVD). For instance, oral delivery of insulin by probiotics is an approach to manage diabetes. Also, suppression of immune response against heat stress proteins (HSPs) is an approach to treat/ manage CVD. Immune response against HSPs is a proposed mechanism for initiation of atherosclerosis. Exposure of HSPs to the gut immune system by probiotics, activates oral tolerance mechanisms against HSPs. So, the immune response is suppressed. Also, specialized probiotics were developed for autoimmune disease such as multiple sclerosis using the mentioned mechanism. To specialized probiotics for diabetes and CVD, genes related to insulin and HSPs are transfected, respectively. Although, there are several clinical trials to evaluate the safety of EPs on human subjects. The products have not yet found the necessary approval to enter the market.

**Keywords:** Engineered probiotics, Chronic disease, Diabetes, Cardiovascular disease



## Probiotics, next-generation probiotics and postbiotics for management of obesity and its-associated complications

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Microbiota offers many benefits to the host since they contribute to the metabolism of nutrients and drugs, prevent the colonization of pathogenic microorganisms, maintain intestinal barrier function, influence host appetite and eating-related behaviors and regulate the immune system. Today, altered intestinal homeostasis is being investigated as a potential additional risk factor for obesity and endocrine disorders. It has been hypothesized that probiotics contribute to the microbiota balance. However, administration of traditional probiotics, different strains of *Lactobacillus* and *Bifidobacterium*, has shown modest anti-obesity properties.

Considering that existing probiotics are not specifically produced for a specific endocrine disease, searching for next-generation probiotics with beneficial health claims could be a novel approach. *Faecalibacterium prausnitzii*, *Akkermansia muciniphila*, *Eubacterium hallii* and *Christensenella minuta* have been identified as candidates for next-generation probiotics. Inanimate microorganisms and/or their components as postbiotics have been shown to contribute health benefits and exert several pharmacodynamic features over live bacteria. Postbiotics are a safer alternative to probiotics, particularly in vulnerable populations which are stable with a long shelf-life and can be administered during antibiotic treatment without affecting efficacy, making them an appealing alternative to probiotics. Modulating the gut microbiota by novel microbiome-based biotherapeutic strategies like next-generation probiotics and postbiotics could be promising in obesity management. However, efficiency and safety issues have to be clarified in further large-scale clinical trials.

**Keywords:** Next-generation probiotics, postbiotics, obesity



## Dietary advanced glycation end products (AGE) and gut microbiota interaction in health and disease

Dr. Mohsen Mohammadi

The human gut microbiota is a complex and dynamic ecosystem with large interindividual differences in composition. Many factors, including diet, genetics, age, geographic origin, and medication, have been demonstrated to affect gut microbiota. Among these factors, diet is one of the most dominant modulators of both composition and function of gut microbiota. In general, gut microbiota dysbiosis affects and increases the risk of multiple metabolic conditions including diabetes mellitus type 2, dyslipidemia, and obesity. Advanced glycation end products (AGE) are products of the Maillard reaction that is known as a typical non-enzymic browning reaction between the free carbonyl group of a reducing sugar and the amine group of a protein. Western diet, rich in processed and/or heat-treated foods, fat and sugar, increases the exposure to AGE. The foods that contain high levels of fat and protein are generally rich in terms of AGE, and are also prone to AGE formation during cooking compared with carbohydrate-rich foods such as vegetables, fruits, legumes and whole grains. In addition, exposure to dietary AGEs has been associated with increased markers of negative health effects such as inflammation, endothelial dysfunction and cardiovascular disease. AGEs exert deleterious effects by binding to their receptor (RAGE). In addition, alterations in gut bacterial profiles are reported to be induced by exposure to heat-treated diets which are high in AGEs with the potential hazardous effects of AGEs on gut microbial metabolism. AGEs in food had a detrimental impact on the population of gut flora, including decreases in the abundance of Bacteroidetes, Bifidobacteria, and Lactobacilli. Further, an increased AGE content led to enhanced protein fermentation, as evidenced by the elevated concentration of branched-chain fatty acids (BCFAs) and ammonia in the colon. Colonic protein fermentation is deemed to be detrimental to host health due to toxic and harmful products such as phenolic, sulphur, indoxyl sulphate, and ammonia, implicating adverse effects on gut health by diminishing the energy supply to colonocytes. In a SD rat model, a high AGE diet reduced the diversity and richness of the gut microbiota, reduced the relative abundance of saccharolytic bacteria, but increased some putatively harmful bacteria, including *Desulfovibrio* and *Bacteroides*. High-AGE diets altered the gut microbiota composition and structure, and induced insulin resistance. Overall, the presence of glycated proteins may have hampered butyrate formation through the loss of their producers, such as Bacteroidales, Ruminococcaceae, and Lachnospiraceae, leading to the impairment of the colonic epithelial barrier (as evidenced by elevated serum LBP levels), and subsequent triggering of chronic low-grade systemic inflammation involved in the pathogenesis of insulin resistance and cardiovascular disease. Together, these findings highlight the pivotal role of AGEs in markedly altering the gut microbiota homeostasis and in promoting the microbiota dysbiosis.



## Food-derived exosomes and disease management

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Exosomes are membrane bound structures which contain mRNAs, microRNAs, and/or proteins. Eukaryotic cells generally secrete these organelles. Recently, isolation of exosomes from some foods such as milk, ginger, and lemon has been reported in several studies. These structures also called food-derived exosomes (FDEs). Exosomes are absorbed by intestinal cells. So, they can travel more distant via the bloodstream. Considering this fact, exosomes can reach and affect distant organs and influence human health. Alleviation of diseases and modulation of the gut microbiota are some potential roles have been shown for FDEs. However, the key mechanism of these roles is still unknown. Furthermore, delivery of anti-cancer drugs such as doxorubicin, can be prepare by exosomes. In fact, these structures may provide biocompatible vehicles for this aim. Therefore, clinicians and medical nutritionists can derive benefit from exosomes in the treatment of various pathological conditions by developing specialized, targeted, and safe therapies. In the present review, the following items will be addressed: introducing FDEs and their contents, pointing their role in human health and disease, and investigation of exosomes' potential function as therapeutic agents.

**Keywords:** Exosome, Food-derived exosome, Disease, anti-cancer drug



## Food and Nutrition Surveillance: The Main Strategy to Eradicate Malnutrition and Cellular Hunger

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In the history of health and medicine, the concept of “surveillance” emerged from communicable disease mainly smallpox, yellow fever, and cholera back to 14th century. However, public health surveillance, as it is known today, came from a lecture by Alexander D. Langmuir, then the chief epidemiologist at the Communicable Disease Center (now it is CDC) presented to the Massachusetts Medical Society in 1962. The idea of surveillance then extended to and was applied in other conditions including nutrition. The concept of nutrition surveillance can be dated to 1992, when the representatives of 152 nations were gathered together to plan for reducing all forms of malnutrition. The accomplishment of that meeting was the Plan of Action for Nutrition describing the strategic activities for eradication of malnutrition and improvement of health through “nutrition surveillance” as the main strategy.

Food and nutrition surveillance (FNS) is defined as “the regular and timely collection, analysis and reporting of data on nutrition risk factors, nutritional status and nutrition-related diseases in the population.” The main aim of FNS is “to provide information useful in supporting, improving and guiding decisions regarding the need for nutrition interventions and the extent and distribution of nutrition problems in the population” National Nutrition and Food Technology Research Institute (NNFTRI), as the sole national center for food and nutrition in the country with the main task of providing policy makers with research-based evidence for appropriate decision-making and interventions, has the mission of establishment of FNS. Nevertheless, despite over six decades passed since the foundation of this institute, FNS has not been fully established in the country. Fortunately, attempts toward this goal were accelerated since about fifteen years ago at NNFTRI despite countless obstacles. In this presentation, the Iran’s experience in FNS, achievements and challenges are discussed.



## Insulin Resistance and Its Long-term Health Consequences

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After a meal, in response to increased blood glucose and other metabolite levels, pancreatic  $\beta$ -cells secrete insulin, a means of coordinating systemic glucose homeostasis. This homeostasis is guided by tissue sensitivity to insulin, which generally describes the efficiency of a given concentration of insulin to normalize blood glucose levels. This normally well-regulated homeostatic mechanism involves multiple processes in several organs, including attenuation of glucose release from the liver (hepatic glucose output), increased glucose uptake into muscle and fat (where it is stored as glycogen), suppressing the release of free fatty acid (FFA) from fat cells (lipolysis), increasing fat accumulation in the liver and fat cells. Individuals with type 2 diabetes (T2D) and many obese individuals exhibit impaired insulin-stimulated glucose uptake into muscle and adipocytes and incomplete insulin suppression of hepatic glucose output, rendering them "resistant insulin". The term "insulin resistance" (IR) was originally coined to reflect the significant variability in the dose of insulin required to reduce high glucose levels in individuals with T2D and subsequently to describe the degree of change in blood glucose levels following administration of a defined levels of insulin or glucose.

3 main sites of insulin resistance are skeletal muscle, liver and adipose tissue. In a chronic caloric surplus, body tissues become resistant to insulin signaling. Skeletal muscle is a large reservoir for glucose circulation, accounting for up to 70% of glucose uptake. A direct result of muscle insulin resistance is a decrease in glucose uptake by muscle tissue. Glucose is shunted from muscle to the liver, where de novo lipogenesis (DNL) occurs. By increasing the glucose substrate, the liver also develops insulin resistance. Higher rates of DNL increase plasma triglyceride content and create an environment of excess energy substrate that increases insulin resistance throughout the body and contributes to aberrant fat deposition in and around visceral organs.

Lifestyle intervention is the cornerstone of insulin resistance treatment. Dietary intervention should include a combination of caloric restriction and high glycemic index carbohydrate reduction. Physical activity improves calorie consumption and insulin sensitivity in muscle tissue. People with insulin resistance are at high risk of developing T2D. The Diabetes Prevention Program and Outcomes Study (DPP & DPPOS) showed that lifestyle intervention is an important and cost-effective intervention for diabetes prevention in high-risk adults.

These interventions include:





- Diet therapy with sodium reduction, fat reduction, calorie restriction and paying attention to the glycemic index of foods
- Training, support, and personalized programs
- A 7% weight loss reduces the onset of T2D by 58%.
- The DPP included a metformin arm that reduced the onset of T2D by 31%.

In this article, we will have an overview of insulin resistance, its causes, complications and how to manage it.



## Food and nutrition security documents in Iran: lessons learned and future directions

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Developing the first National Nutrition and Food Security Policy (NNFSP) was ordered by Community Nutrition Office, Iranian Ministry of Health and conducted with cooperation of National Nutrition and Food Technology Research Institute and National Institute of Health Research in 2012. The main outcomes of the NNFSP can be summarized as follows: responsibilities of the eight involved organizations were agreed through signing a memorandum; and requirements for establishing the document including an appropriate structure, human, and financial resources, have been considered. Moreover, executive operation of the document was monitored by supervising committees. Evaluation of the document after 4 years by the Food and Nutrition Security Working Committee secretariat of the Supreme Council in 2016 to provide evidence for reforming and updating the contents of the document showed the average adaptation of the NNFSP Document goals was 52.6%. The average adaptation of the document establishment method to desired state was 41%.

In 2023, a comprehensive document on food security was approved by the Supreme Council of Health and Food Security from the collection of related documents, but it was not repealed. After that, the knowledge-based document on food security was approved and promulgated in the Supreme Council of the Cultural Revolution. Some differences in the frameworks and implementation mechanisms of these two documents have caused problems for organizations and stakeholders involved in food security and safety in Iran.



## Policy Recommendations for Food and Nutrition System Stewardship and Governance

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Effective policy integration and Food and Nutrition System Stewardship and Governance is essential for ensuring food and nutrition security. When policies fail to align, they can lead to unintended consequences and undermine the fundamental “do no harm” principle. Moreover, these policy inconsistencies impact the journey toward sustainable development by complicating interactions, roles, and functions across various development domains within the food and nutrition system. In diverse contexts, conflicting policies related to food and nutrition security, social well-being, environmental conservation, and public health hinder the achievement of sustainability.

Despite ongoing development efforts and infrastructure programs, gaps persist in the food and nutrition system. The transition from mere “policy coordination” to “integrated policy formulation” remains a challenge for Iran’s food and nutrition system. The ultimate objective is sustainable food and nutrition security. However, during policy formulation and implementation, conflicts occasionally arise among food and nutrition policies, affecting their long-term success. The accumulation of non-cohesive policies and laws within the food and nutrition system may stem from institutional inefficiencies.

To address this, efforts are underway to gain a clearer understanding of Iran’s non-integrated food and nutrition system. Identifying the root causes and enabling policymakers to shift from “agricultural policies” to “food policies” in alignment with public health is crucial for sustainable development. Policy recommendations span three key areas: (a) policymakers, (b) food, agriculture, and health sectors, and private sector and civil institutions.



## Addressing Food Security Challenges in the Face of Sanctions and Post-COVID-19 Realities: A Comprehensive Approach

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In light of the re-imposition of United States sanctions, the prevailing Covid-19 pandemic, and the concomitant escalation of food prices, a notable segment of the population in our country faces heightened food insecurity concerns. This study, examines the intricate dynamics of the present food security crisis.

Utilizing data from the Iranian Statistics Center, our research reveals significant levels of food insecurity, with estimates at 11.2% in urban areas and a substantial 29.2% in rural regions. In response to these pressing challenges, strategic recommendations are proposed.

The study underscores the importance of a nuanced and systematic response to crisis resolution. Beyond the statistical indices, it advocates for a meticulous evaluation of individuals' nutritional status as a foundational step for targeted interventions. Furthermore, the establishment of a resilient food bank, emerges as a pivotal strategy to ensure equitable food distribution.

The paper accentuates the role of comprehensive educational programs as integral components of the proposed strategies. These educational initiatives aim to empower individuals with the knowledge and skills necessary for maintaining a healthy diet within budget constraints.

In conclusion, this study serves as a substantive guide for policymakers and stakeholders, providing a structured framework to address immediate food security concerns while laying the groundwork for sustained resilience in the face of evolving challenges.

**Keywords:** Food security; Sanctions; Covid-19 pandemic; Food bank



## The effect of climate changes on food and nutrition security

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**Background & Objectives:** Nutrition is highly susceptible to changes in climate and bears a heavy burden as a result, as seen in the impaired nutrient quality and dietary diversity of foods produced and consumed. Agriculture and food production are affected by climate variability and extremes like heat, drought, floods, and storms. All dimensions of food security and nutrition are likely to be affected, including food availability, access, utilization and stability. Climate variability and extremes are undermining in multiple ways food availability, access, utilization and stability, as well as feeding, caregiving and health practices. The aim of this review is to examine the mechanisms of climate change's impact on various aspects of food security.

**Methods:** This narrative review carried out based on the search strategy in scientific databases such as PubMed, Science-Direct and Google Scholar using Keywords like climate change, food security, quality and quantity, impact and food system from 2015 to 2023. **Results:** Changes in climate impact heavily on nutrition through: impaired nutrient quality and dietary diversity of foods produced and consumed; effects on water and sanitation, with their implications for patterns of health risks and disease; and changes in maternal and child care and breastfeeding. The most significant impacts of climate change on food insecurity can be classified into several sections:

Impacts on food availability

Food imports increase when production shortfalls occur and countries try to compensate for domestic production losses through imports, but supplies are often limited. The shortfalls in agricultural output have a negative impact on both short- and long-term food security and nutrition.

Impacts on food access

Food access is at risk due to high food price volatility, particularly in low- and middle-income countries and among poorer groups in high-income countries. Those whose livelihoods are based on agriculture and natural resources will face income loss.

Impacts on food utilization and food safety

Coping strategies due to income reductions and high food prices that compromise dietary diversity and quality include eating fewer meals per day and less at each meal,



skipping meals and eating less nutrient-dense foods and/or more calorie-dense foods high in fat, sugars and salt. Food variety, dietary diversity, and food/nutrient intake can vary depending on the seasons. The quality and safety of food may decrease as a result of higher intensity rainfall causing mold growth and crop contamination. Pest and fungi may develop during storage due to higher temperatures, which could result in nutrient deterioration. The nutritional status of the most vulnerable is threatened by a vicious cycle of diarrhea and malnutrition caused by unsafe water and food. Climate variability and extremes affect the survival or multiplication rates of certain food-borne pathogens, such as Salmonella. A higher mobilization of heavy metals can be caused by rising sea surface temperature, leading to their accumulation in the food chain and ultimately harm consumers. The quality of diets can be affected by climate extremes through disruption of transport infrastructure, leading to spoilage and/or decreased access to fresh fruit and vegetables, meat and dairy products, in addition to decreased concentration of protein and micronutrients such as zinc and iron.

### Impacts on health and nutrition

Climate variability and extremes can affect human health directly, through changes in temperature and precipitation and natural hazards; as well as indirectly, through the effect of climate on environmental risks (e.g. vector-borne and other infectious diseases, crop failures), food safety risks (mycotoxins, heavy metals, harmful algal blooms, etc.) and social responses to climate shocks (e.g. displacement of populations following prolonged drought).

### Impacts on women and child care

Climate shocks have the potential to increase the workload of women farmers and increase the risk of health issues related to farming. This can make it hard for women to adhere to recommended breastfeeding and complementary feeding practices and provide nutritious food with recommended frequency and responsiveness to their young children.

**Conclusion:** In summary, climate change brings a plethora of risks ranging from physical impacts to ecosystems, agro-ecosystems, agricultural production, food chains, incomes and trade, with economic and social impacts on livelihoods and food security and nutrition. The changes needed for adaptation to climate change in agriculture and food systems for food security and nutrition will require to be enabled by investments, policies and institutions in various areas. Integrating strategies and plans that are gender-sensitive, multi-scales, multi-sectors and multi-stakeholders is crucial for the most effective outcomes of such interventions.

**Keywords:** climate change, food security, quality and quantity, impact, food system



## Food Security under Climate change Governance in Iran

Ramesh Allipour-Birgany  
Ph.D. Food and Nutrition Policy

**Introduction:** Climate change and food security are complicated problems with considerable drivers. Hence many actors with different interests are contributing in decision making of these issues. policy makers efforts to cope with these challenges.

**Objective:** To increase food security under climate change in context of Iran we developed a horizontal and vertical governance model.

**Methods:** This is a qualitative study. We applied a document analysis. Then through semi-quantitative interview with key informants of food security and climate change in national and international levels the main themes were extracted. In the next stage, the health policy analysis was conducted and the constructs employed to develop a new model.

**Results:** Eight themes and eight constructs were applied through joined up policy approach to develop a new model of food security under climate change governance model. The main explored constructs were: common voice, leadership, scientific evidence, economic support, collaboration, advocacy, early warning system, supreme policy-making center.

**Conclusion:** The policy reform to improve the food security under climate change in Iran through a new governance model with redesign a vertical and horizontal structure of decision making is necessary.

**Keywords:** climate change, Food Security, governance, policy analysis, Iran.



## Effects of lifestyle factors on regression and progression of prediabetes: Findings of a 9-year follow-up in the Tehran Lipid and Glucose Study

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Prediabetes (Pre-DM) is an intermediate state of hyperglycemia, diagnosed by either isolated-impaired fasting glucose (i-IFG), isolated-impaired glucose tolerance (i-IGT), or combined IFG-IGT. Pre-DM will progress to type 2 diabetes (T2D) in 25% of participants during 3-5 years, and 70% of Pre-DM subjects are expected to develop T2D within their lifetime. Here, we discuss factors affecting Pre-DM regression to normal glucose regulation (NGR) and progression to T2D, which was investigated through a 9-year follow-up of Pre-DM participants of the Tehran Lipid and Glucose Study. From 1458 Pre-DM cases (aged  $\geq 21$  years) followed from 2006-2008 to 2015-2017, 39.0% of the participants developed T2D and 37.7% returned to NGR. Regression to NGR was associated with younger age, female sex, lower body mass index (BMI), no family history of diabetes (FHD), no smoking, higher HDL-C, and higher endogenous nitric oxide production (i.e., indirectly measured by serum nitrate and nitrite concentrations). Older age, higher BMI, diastolic blood pressure, total cholesterol, lower HDL-C, and FHD were associated with progression to T2D. Compared to mild-moderate adipose tissue dysfunction (ATD, i.e., defined based on the age-stratified cutoff values of visceral adiposity index), severe-ATD was a strong predictor of T2D (relative risk ratio (RRR):1.45, 95% CI: 1.08-1.93). Severe ATD was also associated with a decreased chance of returning to NGR by 26% (RRR: 0.74, 95% CI: 0.55-0.99). Compared to subjects with physical activity (PA)  $<600$  MET-minutes/week, the chance of regression to NGR increased by 58% in those who had PA $>1500$  MET-minutes/week (RRR: 1.58, 95%CI: 1.03-2.40). Every 500 MET-min/week activity indicated an elevated chance of returning to normoglycemia by 5% (RRR: 1.05, 95% CI: 1.01- 1.11). Decreased body weight (BW, 0-5 and  $\geq 5\%$ ) was associated with regression to NGR (RRRs=1.44, 95% CIs=1.05-1.98, and 2.64, 1.63-4.28, respectively). Decreased BMI and WC  $\geq 5\%$  were also associated with regression to NGR (RRRs=1.63, 95% CI=1.01-2.64; 1.69, 1.20-2.37, respectively). Among dietary factors, adhering to a Western-style dietary pattern (i.e., characterized by a higher load of processed meats, sodium intakes, fast foods, salty snacks, sweets, and candies) increased the risk of progressing to T2D by 38% (RRR: 1.38; 95% CI:1.00 to 1.89, P: 0.050). Increasing consumption of low-fat dairy by 0.50 serving/d was associated with a lower risk of progression to T2D (OR: 0.56; 95% CI: 0.35-0.90). A 25% reduced risk of de-





veloping T2D was observed per each 5g/1000 kcal per day increased dietary intake of fiber (RRR: 0.75, 95% CI: 0.58-0.98, P: 0.038). Coffee drinking, compared to no drinking, doubled the chance of returning to NGR (RRR: 2.26, 95% CI: 1.03-4.97). Compared to non-drinkers, coffee drinkers also had significantly lower 2-hour serum glucose concentrations over time (152, 95% CI=144-159 vs. 162, 95% CI=155-169 mg/dL, P=0.05). An excessive amount of nitrite intake ( $\geq 10.8$  vs.  $< 7.8$  mg/d) was associated with a 2-fold elevated risk of developing T2D among Pre-DM subjects (RRR=2.19, 95% CI=1.00-4.84).

In conclusion, adhering to a more healthy lifestyle, i.e., healthy dietary patterns and moderate PA levels ( $> 600$  MET-minutes/week), and reducing at least 5% of initial BW, may increase the probability of regression to NGR and decrease the risk of developing T2D in Pre-DM subjects.

**Keywords:** Prediabetes, normal glucose regulation, type 2 diabetes, body weight reduction, physical activity, diet



## Personalized nutrition and Single Nucleotide Polymorphisms (SNPs)

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Personalized nutrition involves providing tailored dietary recommendations to optimize health benefits based on an individual's lifestyle, metabolism, phenotype, microbiome, and genetic makeup. Single Nucleotide Polymorphisms (SNPs) are the most common and widely studied genetic variations in humans, defined as a genomic variant at a single base position in DNA that is present in more than 1% of the population which can result in the change of one amino acid in the final protein sequence. While they may not cause a disorder, SNPs can impact how the human body responds to diet and metabolizes nutrients, potentially predisposing individuals to certain conditions.

To date, the relationship between Single Nucleotide Polymorphisms and various nutrition-related conditions has been studied, including obesity, weight loss, appetite, food preferences and susceptibilities, lipid metabolism and dyslipidemia, carbohydrate metabolism and diabetes, as well as vitamin and mineral metabolism (such as folic acid, vitamin D, iron, and calcium), response to supplementation, non-alcoholic fatty liver disease, and alcohol and caffeine metabolism. It is important to note that since many disorders involve multiple genes, further research is needed to clarify specific gene-diet interactions and the phenotypic outcomes of multiple SNPs.

Nutrigenomics, which provides data to improve metabolic health, is a valuable tool for nutritionists. Considering different SNPs when designing individualized diets and interventions appears to yield positive results in terms of improving nutritional balance and maintaining health. Integrating genetic data into nutrition science has the potential to not only improve individual health but also reduce the burden of nutrition-related diseases in the community.



## The Role of Personalized Nutrition: Unveiling the Truth about Weight Regain after Weight Loss Diets

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Initial success in weight loss through lifestyle intervention strategies is often followed by unsuccessful long-term weight maintenance, as the majority of obese individuals regain the weight they lost. This unintentional weight regain is a common problem that continues to challenge us today. Personalized diets have emerged as a popular trend in the field of nutrition, utilizing individual-specific information rooted in evidence-based science to promote dietary behavior change and potentially yield measurable health benefits. While certain aspects of personalized nutrition, such as advice based on diet, lifestyle, phenotype, and personal goals, are already regularly utilized, advancements in science have provided us with an array of tools to prescribe personalized nutrition. Many of these tools focus on assessing individual characteristics such as genetic information, disease status, dietary intake, nutrient status, anthropometrics, physiological state, food preferences, lifestyle, and sensory preference. Based on available scientific evidence, it appears possible to slow down weight regain after following personalized diets. For example, a 2-year diet intervention trial by Erez et al. showed that genetic variants in the leptin gene were significantly associated with weight regain after 6 months of weight loss. Furthermore, the inclusion of genotypes improved the predictive value of weight regain by 34%. The Diet, Obesity, and Genes study, which randomly assigned 742 participants to different diets based on their glycemic index levels, observed that SNP-diet interactions had an impact on weight, waist, and fat mass regain. These suggest that genetic variation in nutrient-sensitive genes can influence one's response to a specific diet. However, the field of personalized diets and its effects on weight changes and regain is still in its early stages, and further research is needed to deepen our understanding in this area.



## Personalized Approach in Nutritional Management of Diabetes

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Personalized nutrition holds immense promise for managing diabetes, a complex metabolic disorder characterized by abnormal blood sugar levels. By tailoring dietary recommendations to an individual's specific metabolic and microbiome profile, genetic predispositions, lifestyle factors, and health status, personalized nutrition can significantly improve glycemic control and overall health outcomes for people with diabetes.

One key application of personalized nutrition in diabetes management is carbohydrate management. Since carbohydrates have the most direct impact on blood sugar levels, customizing carbohydrate intake based on factors like insulin sensitivity, drug metabolism rate and glycemic response can help individuals with diabetes better regulate their blood sugar levels.

Moreover, personalized nutrition can address individual variations in nutrient needs and dietary preferences. Some individuals may respond better to a Mediterranean-style diet while others may benefit from a plant-based diet or a low-fat approach.

Furthermore, personalized nutrition can integrate technology and data analytics to track dietary intake, blood sugar levels, and other relevant parameters in real-time. This enables healthcare providers to adjust recommendations promptly and empower individuals with diabetes to make informed dietary choices.

Despite its potential, the widespread implementation of personalized nutrition in diabetes management faces challenges such as accessibility, affordability, ethical considerations and the need for robust evidence-based guidelines. Overcoming these hurdles requires collaboration among healthcare professionals, researchers, policymakers, and technology developers to ensure that personalized nutrition becomes an integral part of diabetes care, ultimately improving outcomes and quality of life for millions of individuals worldwide.

**Keywords:** Diabetes Mellitus, Dietary management, Personalized nutrition



## Psychological factors effective in changing nutritional behavior

Akbar Fazel-tabar Malekshah

Changing behavior and following a healthy lifestyle is one of the pillars of obesity treatment, which is one of the big and important challenges in today's societies. Since obesity has multidimensional causes, it requires multidimensional interventions including nutritional, social, psychological and finally lifestyle. The factors leading to the occurrence of behavior are influenced by various biological, psychological, social and spiritual aspects, failure to pay attention to each aspect can have serious problems in the intervention results. Stress is one of the important factors that affect the mind, so when a person is stressed, he can consider food as a defense mechanism to reduce stress and, as a result, consume more calories. In addition to stress, depression and anxiety are also important factors affecting the mind. At this time, the person may consider food as a solution to reduce tension and discomfort. Also, hormonal changes, both natural and unnatural, can play a significant role in a person's mind and behavior and ultimately cause overweight and obesity. In general, psychological changes can affect behavioral and eating patterns, physical activity and even the reliability of reaching physical fitness due to the increase of stress hormones. Another reason for resistance to changing behavior for the treatment of overweight and obesity can be referred to individual or social subjective interests of the person. Also, auditory and visual feedback in childhood has a direct relationship with the effect on the cognitive perception of behaviors in adolescence and adulthood. The combination of physiological (changes in diet and suitable exercise programs) and psychological (focusing on psychotherapy, using stress and anxiety management techniques, hypnosis, life skills training such as emotion management, problem solving and anger control...) as well as community Cognitive and spiritual means using methods and solutions that pay attention to the main aspects of a person's behavior at the same time



## Gut Brain Axis, Nutrition and Neurologic Diseases

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Gut bacteria population has reproducibly been involved in vast human diseases, including inflammatory bowel disease, psoriatic arthritis, type 1 diabetes, atopic eczema, coeliac disease, obesity, type 2 diabetes, arterial stiffness and brain disorders.

Human microbiota has, therefore, a fundamental role in host physiology and pathology. Gut microbial alteration, known as dysbiosis, is a condition associated not only with gastrointestinal disorders but also with diseases affecting other organs. (Fig. 1)

Recently, it became evident that the intestinal bacteria can affect the CNS physiology and inflammation. The nervous system and the gastrointestinal tract are communicating through a bidirectional network of signaling pathways called the gut-brain axis (GBA), which consists of multiple connections, including the vagus nerve, the immune system, and bacterial metabolites and products. The enteric nervous system (ENS) is the largest component of the autonomic nervous system and is uniquely equipped with intrinsic microcircuits that enable it to orchestrate gastrointestinal function independently of central nervous system (CNS) input. Here, we will be addressing the main neurological disease that are evidently linked to GBA.

MS- Patients with RR-MS have a microbiota that, compared with healthy controls, has higher amounts of species including *Pedobacteria*, *Flavobacterium*, *Pseudomonas* and *Streptococcus*. In contrast, they have a lowered microbial population of *Prevotella*, *Bacteroides*, *Faecalibacterium* and *Lactobacillus*. Restoration of the microbial population through dietary manipulations in patients with RR-MS appears to reduce inflammatory events and the reactivation of the immune system.

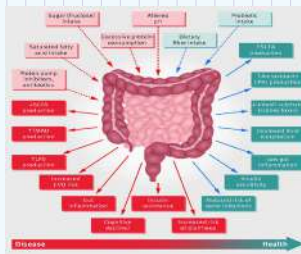
PD- Recent researches suggest a potential relationship between the gut bacteria and the brain neurodevelopment, brain function and disease. This bidirectional communication is often referred to as the microbiome-gut-brain axis. Evidence indicates the potential role of the microbiome-gut-brain axis play in the underlying pathological mechanisms of Parkinson's disease.

Migraine- It has been estimated that appx. 14% of the adult population worldwide are affected by migraine being three times more prevalent among females. According to Global Burden of Disease (GBD) study in 2018, migraine has been recognized as the first leading cause of disability in those aged less than 50 years. The exact pathogenesis of migraine is still unclear but it comprises numerous factors, including the GBA. To date, several researches have shown that migraine is associated with some GI disorders such as *H pylori* infection, IBS, and celiac disease. The effects of diet are of interest.

CONCLUSION: Current evidence suggests a reciprocal influence of GBA and inflam-



matory activation in the brain. The diverse bidirectional interactions of GBA and food/ dietary ingredients can no longer be ignored. More evidence is warranted before these findings can be translated for diagnostic and therapeutic applications in human.



Role of the gut microbiota in health and disease.

CVD=cardiovascular disease; IPA=indolepropionic acid; LPS=lipopolysaccharide; SCFA=short chain fatty acids; TMAO=trimethylamine N-oxide

Valdes AM, et al. BMJ 2018;361:k2179.



## Nutrition in ADHD

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Attention-deficit/hyperactivity disorder (ADHD) is one of the most common and most studied neurodevelopmental disorders in children. The worldwide prevalence of ADHD is reported to have risen over the past 10 years (affecting ~7% of children and adolescents). Moreover, ADHD prevalence transitions into adulthood is around 30–50% of cases. ADHD is a long-term (chronic) brain condition, which results in executive dysfunctions such as difficulties in managing behavior, paying attention, regulating mood, staying organized and concentrating. Without treatment, ADHD can potentially lead to long-term complications e.g. poor self-esteem, anxiety, depression, and eating disorders. Although the treatment is based on behavioral therapy and medications, evidence demonstrates that dietary patterns may influence the risk of ADHD, and specific dietary interventions such as nutritional supplements, gut microbiome-targeted interventions with probiotics, and elimination diets could be used as adjuvant therapy. In such conditions, parents are often unaware of the proper methods to use to communicate around foods and mealtimes and negative communications may create adverse experiences and children may even refuse to eat food. Parents can be valuable role models and may positively impact children's eating behaviors, particularly when combined with family-based interventions. This paper aims to review dietary patterns and interventions as well as nutritional supplements that are associated with ADHD.





## Sport nutrition and exercise-induced mental fatigue

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The multifaceted nature of exercise-induced fatigue encompasses two distinct types: central fatigue, associated with the central nervous system, and peripheral fatigue, rooted in the muscular system. Mitigating strategies involving dietary interventions and specific supplements have shown promise in attenuating this physiological phenomenon.

In the context of central fatigue, which has been comparatively more underexplored than peripheral fatigue, the pivotal role of Branched-Chain Amino Acids (BCAAs), namely Leucine, Isoleucine, and Valine, emerges. Trained individuals may experience performance constraints due to diminished BCAA levels during prolonged activity, resulting in elevated serotonin production and subsequent central fatigue. Addressing this, BCAAs supplementation (100-300 mg/kg body weight) prior to prolonged exercise holds potential for reducing central fatigue.

Exercise-induced diminishments in blood glucose levels, compounded by the sports activities and the absence of isotonic sports drink consumption, can elevate the transit of tryptophan across the blood-brain barrier. This phenomenon, particularly pronounced during cognitively demanding activities, contributes to athlete fatigue. Recent studies suggest that choline amino acid consumption may exert a mitigating effect.

Comprehensive comprehension of the fatigue processes during exercise remains elusive, necessitating further research endeavors. Evaluation of the efficacy of specific dietary patterns, such as heightened intake of polyphenol and flavonoid-rich foods like fruits and fish, or supplements like creatine, tyrosine, and caffeine, demands rigorous investigation. The evolving science underscores the imperative for expanded inquiry in this domain.

**Keywords:** Central fatigue, Supplement, Nutrition



## Herbal supplements for health promotion and as an adjunct treatment: Benefits and Hazards

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Many naturopathic medicines have been used for centuries. Most medications, herbal preparations, and nutraceutical supplements have notable effects on biochemical pathways. Herbal supplements, herbal products or herbal medicines are produced from plants or medicinal plants to maintain health or treat diseases. Herbal supplements are products that are specifically intended for internal use. A large number of prescription drugs and over-the-counter drugs are derived from plant derivatives. Herbal supplements are often sold in solid forms (capsules, tablets, pills, tablets), but are also available in liquid or powder forms.

This presentation focuses on common herbal supplements and evaluates the therapeutic effects of these drugs. The interaction of herbal supplements with allopathic medicines is complex. In detecting possible interactions between supplements and drugs, thorough notes should be taken on herbal supplement usage, including initiation and discontinuation. Clinicians need to understand whether an herbal supplement affects a prescribed drug's clinical effect without affecting its dosage or whether it is affecting the concentration in the blood and, therefore, its pharmacologic action (pharmacokinetics). This understanding will lead to a more informed decision on whether to change the dosage of a drug or discontinue the supplement(s) in question altogether. Nurses need to include these agents in the patient's medication record. The pharmacist can consult with the clinician to check for interactions, as these are often not benign substances and can alter drug therapy. Providing continuing medical education (CME) and/or further research into herbal supplement-prescription drug interactions would increase understanding and benefit the patient-physician relationship.



## The Role of Dietary Supplements during Cancer Therapy

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Cancers are the second cause of mortality, worldwide. Medical treatments and metabolic disorders lead to gastrointestinal complications that lead to unmet nutritional requirements, malnutrition, weight loss and cachexia, consequently. As a result, cancer patients need nutritional supports. Modifications in the diet, such as nutritional supplementation (vitamins and trace elements), can alleviate complications and improve quality of life. The previous evidence about taking nutritional supplements during cancer treatment is controversial. Although a body of evidence supports the use of nutritional supplements during cancer therapy, and its potential effect on reducing inflammation, and improving the nutritional status, quality of life, and cancer prognosis, there are still challenges in this regard. So, we aimed to evaluate the role of nutritional supplements during cancer therapy and explore when and what nutritional supplements are required.



## Protein supplements in sport nutrition, proper use and safety considerations

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Consumption of protein supplements has become very common in the last few decades, especially among athletes. The decision to use protein supplements should only be made by considering several factors, including the level (intensity and duration) of the exercises, goals of the athlete, life style, daily energy requirement, diet and available financial resources. However, precise and logical usage of protein supplements could be considered in cases such as:

- When the consumption of fast-digesting proteins is the priority; especially after workouts
- To compensate for the main meal or snacks which have little protein
- To replace natural foods and large meals during lack of appetite
- When the condition for storing or preparation of protein food is not possible, or the quality and access to protein-rich foods in the local environment is limited.
- During a professional weight loss diet plan that higher protein intake on a low energy diet is required to optimize lean mass maintenance/increase.

Depending on the athlete's body size, energy requirements, and other nutritional goals, an exclusive supplement providing 20-40 grams of protein per serving (0.3 g/kg Body weight) will probably meet most sports nutrition requirements.

Concerns about the use of protein supplements in athletes include unnecessary cost, impact on the total intake of nutrients and nutritional goals, unnecessary and harmful excessive intake of protein, positive test for doping and allergies. Therefore, a thorough nutrition assessment of the athlete is necessary prior to protein supplementation.



## Food Fortification as a Cost-Effective Strategy to Enhance Nutrition: Challenges, Limitations and Opportunities for the Future Path

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It is believed that history of food fortification is back to 4000 B.C., when the Persian physician Melampus suggested adding iron filings to wine to increase soldiers' "potency". Nevertheless, in new era, a French physician named Boussingault recommended adding iodine to salt to prevent goiter. Later, during the period between the two World Wars (1924-1944), food fortification was employed to correct or prevent nutritional deficiencies in general population.

Despite a seemingly long history in Iran, the life of food fortification has begun just about three decades ago when iodine was added to salt to lower the burden of iodine deficiency disorders (IDD) in the country. Thirteen years later, mandatory addition of iron and folate to the bakery's flour was implemented as a strategy to fight iron deficiency. Nowadays, food fortification is considered not only as a strategy to prevent micronutrient deficiencies but as a measure to improve general health, as well. Recent findings of micronutrient deficiencies in different age and sex subgroups in Iran (especially vitamin D deficiency (VDD)) have necessitated urgent interventions that are cost-effective, long-lasting and sustainable. A huge body of evidence has proved food fortification is among these strategies. In this presentation, different forms and aspects of food fortification, the challenges and advantages are discussed alongside a brief overview of almost two decades experience of National Nutrition and Food Technology Research Institute (NNFTRI) in this field.



## Nutritional Supplements in Autoimmune Disease: Friend or Foe?

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Autoimmune diseases are considered by the immune system to attack healthy cells and tissues, leading to chronic inflammation and a variety of symptoms. As part of a comprehensive approach to managing autoimmune diseases, nutritional supplements have increased consideration for their potential to support immune function, reduce inflammation, and address nutrient deficiencies. However, the role of nutritional supplements in autoimmune disease management remains a topic of debate.

While some supplements, such as vitamin D, omega-3 fatty acids, and probiotics, have shown promise in modulating immune responses and reducing inflammation, others may have inadequate or conflicting evidence. The efficiency of supplements can vary depending on the specific autoimmune disease, individual factors, and the quality of the supplements used.

Furthermore, there is a potential for supplements to interact with medications or have unintended side effects. Therefore, individuals with autoimmune diseases must consult with healthcare professionals, such as registered dietitians or doctors specializing in autoimmune diseases, to determine the appropriateness and safety of specific supplements for their condition.

An individualized approach is important, considering factors such as nutrient insufficiencies, overall diet quality, and specific symptoms of the autoimmune disease. While nutritional supplements can provide support in managing autoimmune diseases, they should not substitute a well-balanced diet and other medical interventions.

In conclusion, nutritional supplements can be a valuable addition to an overall treatment plan for autoimmune diseases, but their use should be approached with carefulness. Collaborative decision-making with healthcare professionals is essential to determine the potential benefits, risks, and appropriate dosages of supplements for each individual's unique requirements. Additionally, more researches are needed to better understand the effectiveness and safety of specific supplements in the context of autoimmune diseases.



# **Oral Communications**



## THE ASSOCIATION BETWEEN DIETARY POLYPHENOL INTAKE AND ATTENTION-DEFICIT HYPERACTIVITY DISORDER: A CASE-CONTROL STUDY

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**Background and Aim:** Previous research found that diets high in fruits and vegetables improved symptoms of attention deficit hyperactivity disorder (ADHD). Nevertheless, the relation between dietary polyphenol intake and the risk of ADHD was not assessed.

**Methods:** The purpose of this study was to see if there was a relationship between dietary polyphenol intake and the risk of ADHD in children in preschool and elementary school. Methods A total of 400 children aged 4 to 12 years old participated in this case-control research (200 children with diagnosed ADHD and 200 healthy controls). The presence of ADHD was diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders-V criteria. To calculate dietary polyphenol intake, a 168-item food frequency questionnaire and the Phenol-Explorer database were used.

**Results:** The risk of incident ADHD for each unit increase of dietary polyphenol intake in the crude model showed an indirect association between dietary polyphenol intake and risk of ADHD (OR: 0.995, 95% CI = 0.994 to 0.996,  $P < 0.001$ ). This finding was still significant even after adjusting for body mass index, energy intake, socioeconomic status, gender, and age (OR: 0.992, 95% CI = 0.989 to 0.995,  $P < 0.001$ ).

**Conclusion:** We found that the increased dietary intake of polyphenols is associated with a lower risk of ADHD in preschool and school children. Prospective studies are needed to corroborate these observations.

**Keywords:** attention deficit hyperactivity disorder, dietary polyphenol





## THE EFFECT OF LOW-CALORIE, LOW-CARBOHYDRATE RAISIN CONTAINING DIET ON LIVER ENZYMES, LIVER STEATOSIS GRADE, INFLAMMATORY AND OXIDATIVE STRESS BIOMARKERS IN NON-ALCOHOLIC FATTY LIVER DISEASE PATIENTS

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**Background and Aim:** Non-alcoholic fatty liver disease (NAFLD), is the pathological accumulation of lipid mainly triglycerides in the liver. Raisin, which is prepared by drying black grapes, acts as an antioxidant. In the present study, the effect of raisins and low-calorie low-carbohydrate diet on liver enzymes, degree of liver steatosis and oxidative stress in patients with non-alcoholic fatty liver were investigated.

**Methods:** In this randomized clinical trial, 46 obese patients with NAFLD were randomly assigned into two groups: one receiving a low-calorie, low-carbohydrate diet (LCLC) (500-700 Kcal less than the daily energy requirement, 45% CHO, 35% fat, 20% protein) and the other receiving a low-calorie, low-carbohydrate diet and raisin (LCLC-R) for 12 weeks. Anthropometric indices, fasting blood sugar, insulin, lipid profile, liver enzymes, inflammatory biomarkers and degree of hepatic steatosis were measured before and after the intervention.

**Results:** Anthropometric indices and degree of hepatic steatosis were significantly decreased in both groups and there was no difference between the two groups. FBS and TG did not change significantly in the two groups. But GGT was significantly reduced in the LCLC group ( $P < 0.001$ ) and MDA, LDL, VLDL and AST in the LCLC-R group ( $P = 0.01$ ). ALT and insulin were also significantly reduced in both groups ( $P < 0.001$ ). TAC also increased significantly in both groups but increased more in the LCLC-R group ( $P < 0.001$ ).

**Conclusion:** It seems that receiving a low-calorie-low-carbohydrate diet with raisin in obese patients with NAFLD significantly protects the liver by significantly improving anthropometric indices, lipid profile, insulin, inflammatory factors, liver enzymes and the degree of hepatic steatosis.

**Keywords:** NAFLD, Non-Alcoholic Fatty Liver, Raisins, Low Calorie Diet, Low Carbohydrate Diet, Hepatosteatois, Metabolic Syndrome



## INVESTIGATING THE PREDOMINANT DIETARY PATTERN IN HASHIMOTO'S THYROIDITIS PATIENTS IN THE IRANIAN ADULT POPULATION, A CASE-CONTROL STUDY

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**Background and Aim:** The present study aims to identify the predominant dietary pattern in patients with Hashimoto's thyroiditis and compare it with the dietary pattern of healthy individuals in the Iranian adult population.

**Methods:** The present study is on two groups of healthy people and a group of people with HT (115 people for each group). The study was conducted at the endocrinology clinic of two medical centers (Firouzgar and Shahid Sardar Soleimani) in Tehran, Iran. Data were presented as mean  $\pm$  standard deviation and percentage, and multivariable logistic regression was used to compare dietary patterns.

**Results:** During the study, three food patterns were identified: traditional, healthy, and unhealthy. The probability of HT was significantly higher in people who followed the traditional dietary pattern, which included visceral meat, sweets, dairy products, and solid fats, compared to the healthy group (OR=9.12; 95% CI=3.98-20.85). On the other hand, the probability of HT was significantly lower in people who followed a healthy dietary pattern, which included fruits, vegetables, legumes, and vegetable oils (OR=0.07; 95% CI=0.03-0.17). A direct and significant statistical relationship was observed between the traditional dietary pattern and thyroid factors TSH, anti-TPO, and TG-ab, while an inverse and significant statistical relationship was observed between HT and the healthy dietary pattern.

**Conclusion:** The dietary pattern of individuals with HT is characterized by saturated fats, visceral meat, and dairy products, which are important factors contributing to oxidative stress.

**Keywords:** "Hashimoto's thyroiditis"; "dietary pattern"; "antithyroid peroxidase"



## ULTRA PROCESSED FOODS INCREASES THE RISK OF PREMATURE CORONARY HEART DISEASE

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**Background and Aim:** Premature coronary artery disease (PCAD) is a heart condition that affects women under the age of 45 and men under 55y. A healthy diet can help mitigate the risk factors associated with coronary artery disease (CAD). One significant factor that influences diet quality and increases the risk of CAD is the consumption of ultra-processed foods (UPFs). This study aimed to examine the relationship between UPFs consumption and PCAD.

**Methods:** This study was conducted on 2351 adults. A validated 110-item food frequency questionnaire used to assess dietary intakes. Foods were classified based on the NOVA system, and the industrial processes they undergo. PCAD was defined as having a stenosis of at least single coronary artery equal and above 75% or left main coronary of equal or more than 50%. Binary logistic regression was used to assess the odds of PCAD across the tertiles of UPFs consumption.

**Results:** Compared to those in the first tertile, participants in the top tertile of UPFs were twice as likely to have PCAD (OR: 2.52; 95% CI: 1.97–3.23). Furthermore, those in the top tertile of UPF intake were more than twice as likely as those in the first tertile to have severe PCAD. (OR: 2.64; 95% CI: 2.16–3.22). Furthermore, the risk and severity of PCAD increased significantly with increasing tertile.

**Conclusion:** In Iranian adults, higher UPF intake increased the risk of PCAD and increased the likelihood of severe PCAD. Longitudinal studies are needed to confirm these results.

**Keywords:** Ultra-processed food, Premature coronary artery disease, Processed food, Coronary artery diseases, Cardiovascular disease



## IMPROVED LIPID PROFILE AND LDLR GENE EXPRESSION FOLLOWING MYO-INOSITOL SUPPLEMENTATION IN OBESE PATIENTS WITH NAFLD: A DOUBLE-BLIND PLACEBO-CONTROLLED RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** Non- alcoholic fatty liver diseases (NAFLD) as the hepatic phenomenon of multi-metabolic disorders is co-incident with hyperlipidemia. In this context, the activation of low density lipoprotein receptor (LDLR) regulates blood cholesterol homeostasis by fine-tuning lipoprotein removal from the circulation. Recently, the potent “anti-hyperlipidemic” effects of myo-inositol (MI) as a cyclohexanehexol has been reported. This study aimed to examine the effects of MI supplementation on LDLR gene expression and lipid profile in obese patients with NAFLD.

**Methods:** This double-blinded placebo-controlled randomized clinical trial was carried out on 48 obese patients with NAFLD confirmed by ultrasonography based on Hamaguchi criteria. The patients was randomly assigned into two groups; MI (4g/day) and placebo (maltodextrin 4g/day) for eight weeks. Pre-and post-intervention, gene expression levels of LDLR was assessed in peripheral blood mono-nuclear cells based on real-time polymerase chain reaction. Fasting serum total cholesterol (TC), high-density lipoprotein cholesterol (HDL-c) and triglyceride levels were assessed and then LDL-c was calculated.

**Results:** Results showed that although a significant increase in the fold changes of LDLR was found in only MI group ( $2.40 \pm 0.43$ ;  $p= 0.004$ ), inter- group changes were not statistically significant at the end of the study. After adjusting for baseline values and energy intake, MI supplementation resulted in significant improvements in TC ( $p=0.010$ ), LDL-c ( $p<0.001$ ) and HDL-c ( $p=0.016$ ) levels.

**Conclusion:** Although results showed that MI supplementation could exert lipid-lowering effects through a slight up-regulation in LDLR mRNA expression in patients with NAFLD, further clinical trials are required to confirm these preliminary findings.

**Keywords:** Myo-inositol; Lipid profile; Gene expression; Non-alcoholic fatty liver disease.



## The Effect of Pineapple Extract on IL-10 Concentration in Liver Tissues of Melanoma-Induced Mice

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**Background and Aim:** Melanoma, characterized by its heightened invasiveness and swift metastasis, represents the most aggressive manifestation of skin cancer. This study delves into exploring the potential anti-cancer attributes of pineapple. Interleukin-10 (IL-10), acknowledged as an anti-inflammatory cytokine, plays a pivotal role in orchestrating immune responses. Initially recognized for its role in inhibiting cytokine synthesis, IL-10 predominantly operates as a robust anti-inflammatory cytokine, suppressing gene expression, macrophage synthesis by T cells and preventing antigen presentation.

**Methods:** The study seeks to evaluate IL-10 concentration in liver tissues subsequent to the administration of pineapple extract to mice induced by melanoma. The investigation of 16 C57 strain mice were categorized into control and pineapple extract groups. Following tumor induction, a six-week resistance training program and gavage administration of pineapple extract (300 mg/kg) were executed. Following the collection of tissue samples, the quantification of IL-10 concentration in liver tissues measured. Data underwent scrutiny via one-way analysis of variance, with the significance level set at  $p \leq 0.05$ .

**Results:** The results unveil a noteworthy reduction in IL-10 concentration in the pineapple group in comparison to the control group ( $p \leq 0.01$ ).

**Conclusion:** The discoveries imply that the consumption of pineapple extract may efficaciously alleviate inflammatory indicators in mice grappling with melanoma. This article has been extracted from the PhD thesis of Foad Asjadi and has been approved by the Ethics Committee of the Sport Science Research Institute (IR.SSRC.REC.1400.085).

**Keywords:** Pineapple, Melanoma, IL10



## WILLINGNESS OF IRANIANS TO PAY FOR ORGANIC FOODS: EGOISTIC OR ALTRUISTIC MOTIVATIONS

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**Background and Aim:** The worldwide demand for organic food is increasing. The primary reason for the popularity of organic foods is the perception that they are healthier, safer, and more environmentally sustainable compared to conventional foods. However, the consumption of organic foods is a relatively new concept in developing nations compared to developed countries. Given the significance of consumer demand in the boost of production and consumption of organic foods, it is essential to pinpoint the various aspects affecting the intention to purchase such products in developing nations, such as Iran. The main purpose of this study was to identify the factors influencing the intention to purchase organic foods, with a focus on whether Iranian consumers are more likely to purchase organic food for egoistic or altruistic motives.

**Methods:** A total of 520 participants, aged between 25 and 65 years, were selected from different geographical locations in Tehran using a multi-stage sampling technique. Data was gathered via a 52-item questionnaire developed by the researcher. The validity and reliability of the questionnaire were evaluated before data collection. Path analysis was used to examine a hypothetical model of predictors of consumers' intention to purchase organic food. The results showed that health consciousness, an egoistic factor, had the greatest impact among the factors influencing consumers' willingness to purchase organic foods, but altruistic environmental concern also motivated purchases. Knowledge, attitude, sensory characteristics, subjective norm and perceived convenience of purchase were identified as additional factors influencing purchase. However, perceived price was identified as a significant barrier.

**Conclusion:** The research showed that environmental concern and health consciousness positively and significantly influence consumers' intention to buy organic food. However, considering the effect coefficients of these factors, it can be inferred that egoistic motives have greater predictive power than altruistic motives when it comes to purchasing organic products among Tehrani consumers.

**Keywords:** Organic food; Willingness to pay; Egoistic; Altruistic; Motivation



## ASSOCIATION BETWEEN PLANT-BASED DIET INDEX AND APPETITE-REGULATING PEPTIDES: A CROSS-SECTIONAL STUDY ON IRANIAN FEMALE ADULTS

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**Background and Aim:** The prevalence of obesity, a complex and multifaceted metabolic disorder, has increased dramatically over the past few decades. Since disruptions in appetite regulation may contribute to obesity and diet plays a significant role in regulating appetite, this study aimed to investigate the association of a plant-based diet index (PDI) with appetite-regulating factors in Iranian women.

**Methods:** A total of 91 apparently healthy women, aged between 18 and 50 years with a body mass index (BMI) ranging from 20 to 35 kg/m<sup>2</sup>, participated in this cross-sectional study. A validated food frequency questionnaire (FFQ) used to create an overall PDI, healthy plant-based diet index (hPDI), and unhealthy plant-based diet index (uPDI). The serum levels of leptin, ghrelin, GLP-1, and IL-6 were measured using ELISA kits. Moreover, anthropometric measurements and physical activity were assessed. Generalized linear regression models were used to determine the association between exposure and outcomes.

**Results:** After adjustment for potential confounders, participants in the lower tertile of OPDI had higher leptin levels compared to the highest tertile (249.87; p<sub>1</sub> vs 3=0.01). Similar results were observed when evaluating the association between hPDI with leptin and GLP-1 (238.52; p<sub>1</sub> vs 3 =0.03, and 18.88; p<sub>1</sub> vs 3= 0.04, respectively). There was also a significant inverse association between OPDI and hPDI with IL6 levels (113.78; p<sub>1</sub> vs 3 =0.01, 130.35; 0.008 respectively). No association was detected between PDI indices and ghrelin levels.

**Conclusion:** Our findings indicated a significant inverse association between overall and healthy plant-based diet index with leptin, GLP-1 and IL-6 in Iranian female adults.

**Keywords:** plant-based diet index; leptin; GLP-1; ghrelin; appetite



## EFFECTS OF POMEGRANATE (PUNICA GRANATUM L.) PEEL EXTRACT ON METABOLIC SYNDROME RISK FACTORS IN NON-ALCOHOLIC FATTY LIVER DISEASE PATIENTS: A RANDOMIZED DOUBLE-BLIND CLINICAL TRIAL

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**Background and Aim:** The aim of our study was to evaluate the effects of pomegranate peel extract (PP) supplementation on hepatic status and metabolic syndrome risk factors in NAFLD patients.

**Methods:** In phase one, the hydro-alcoholic extraction of the peel of 750 kg of pomegranate was performed by the soaking method. Then, in phase two, NAFLD patients received 1500 mg of placebo (n=37) or pomegranate peel capsules (n=39) with a 500-kcal deficit diet for 8 weeks. Gastrointestinal intolerance, dietary intake, lipid and glycaemic profiles, blood pressure, body composition, insulin resistance indexes, and elastography-evaluated NAFLD changes were followed.

**Results:** The mean age of participants was  $43.1 \pm 8.6$  years (51.3% female). Following the intervention, the mean body weight (mean changes:  $-5.10 \pm 2.30$  kg), WC ( $-7.57 \pm 2.97$  cm), BMI ( $-1.82 \pm 0.85$  kg/m<sup>2</sup>), body fat index ( $-1.49 \pm 0.86$ ), and trunk fat ( $-3.93 \pm 3.07\%$ ), SBP ( $-0.63 \pm 0.29$  cmHg) and DBP ( $-0.39 \pm 0.19$  cmHg), TC ( $-10.51 \pm 0.77$  mg/dl), TG ( $-16.02 \pm 1.7$  mg/dl), LDL-C ( $-9.33 \pm 6.66$  mg/dl; all  $P < 0.001$ ), fat free mass ( $-0.92 \pm 0.90$  kg;  $P < 0.003$ ), and FBS ( $-5.28 \pm 1.36$  mg/dl;  $P = 0.02$ ) decreased significantly in PP in contrast to the placebo group in the raw model and when adjusted for confounders. Also, HDL-C ( $5.10 \pm 0.36$  mg/dl), liver steatosis and stiffness ( $-0.30 \pm 0.17$  and  $-0.72 \pm 0.35$  kPa, respectively, all  $P < 0.001$ ) improved in the PP group. However, fasting insulin ( $P = 0.81$ ) and HOMA-IR ( $P = 0.93$ ) were not significantly different when comparing two groups during the study in the raw and even adjusted models.

**Conclusion:** In conclusion, 1500 mg pomegranate peel extract along with a weight-loss diet improved metabolic syndrome risk factors and reduced hepatic steatosis in patients with NAFLD after 8 weeks.

**Keywords:** Pomegranate Peel, Metabolic syndrome, Fatty liver, Dyslipidaemia, Hypertension





## ASSOCIATION OF MALNUTRITION-INFLAMMATION SCORE WITH METABOLIC PARAMETERS, INTERDIALYTIC WEIGHT GAIN, UREMIC PRURITUS, SLEEP QUALITY, MENTAL HEALTH, AND QUALITY OF LIFE IN MAINTENANCE HEMODIALYSIS PATIENTS

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**Background and Aim:** To assess the association between Malnutrition-Inflammation Score (MIS) and metabolic parameters, interdialytic weight gain (IDWG), uremic pruritus, sleep quality, mental health, and quality of life (QOL) among maintenance hemodialysis (HD) patients.

**Methods:** A multicenter cross-sectional study was conducted at eight HD centers in Shiraz, Ahvaz, and Shushtar, Iran. Participants were HD patients with at least 6 months of dialysis history. Nutritional status was assessed using the MIS and food frequency questionnaire (FFQ). Other data were obtained through the Yosipovitch Pruritus Questionnaire, Pittsburgh Sleep Quality Index, Depression, Anxiety, and Stress Scales (DASS-21), and Kidney Disease Quality of Life (KDQOL-36). Linear regression was employed to evaluate the relationship between MIS scores and dependent variables.

**Results:** A total of 479 patients were included, with a mean age of  $53.7 \pm 14.97$  years and HD duration of  $48.47 \pm 59.58$  months. Patients with higher MIS exhibited significantly lower protein intake ( $p < .05$ ). Uremic pruritus was prevalent in 40.3% of the participants. In adjusted linear regression analysis, MIS was found to be positively associated with pruritus score ( $B = 0.14$ ), serum ferritin ( $B = 19.17$ ), IDWG ( $B = 0.22$ ), sleep disturbances ( $B = 0.20$ ), depression ( $B = 0.42$ ), anxiety ( $B = 0.35$ ), and stress ( $B = 0.34$ ) and negatively associated with serum iron ( $B = -3.57$ ), and QOL scores ( $B = -0.82$ ).

**Conclusion:** In this study, higher MIS was associated with increased serum ferritin, IDWG, sleep disturbances, depression, anxiety, and stress, and lower serum iron and QOL scores.

**Keywords:** malnutrition, interdialytic weight gain, uremic pruritus, sleep quality, mental health, hemodialysis



## RELATIONSHIP BETWEEN BODY COMPOSITION AND BONE DENSITY IN POSTMENOPAUSAL WOMEN WITH PRIMARY OSTEOPOROSIS

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**Background and Aim:** Osteoporosis is a silent epidemic due to its prevalence worldwide and increasing number of patients. The present study was conducted to determine the relationship between body composition and bone density in postmenopausal women with osteoporosis.

**Methods:** This descriptive-analytical cross-sectional study was conducted on 109 postmenopausal women aged 50-65 years by simple random sampling in Tabriz health centers from Sept. 2018 to July 2019. Bone density was assessed by dual energy X-ray absorptiometry. The questionnaires of demographic-social characteristics, obstetric and medical characteristics were completed. Data were analyzed by SPSS software version 24 and descriptive statistical methods: Pearson correlation test, Kolmogorov-Smirnov test, one-way ANOVA, independent t-test, Spearman test and linear regression.

**Results:** The mean (SD) age of the patients was 58.13±3.74 years. The mean (SD) of menopause duration was 9.2±5.2 years. The mean bone mass density in the femoral neck was significantly higher in married people than in single people ( $p=0.026$ ). There was a significant negative relationship between the number of pregnancies and the bone mass density of the femoral neck ( $p=0.038$ ). There was a significant positive relationship between femoral neck bone density and body weight ( $p<0.001$ ), body fat percentage ( $p=0.018$ ), body fat mass ( $p=0.001$ ), visceral fat mass ( $p=0.002$ ), mineral content ( $p=0.001$ ), total body water content ( $p=0.049$ ) and body mass index ( $p=0.004$ ).

**Conclusion:** Increasing body composition indices were positively associated with higher bone density in the femoral neck. Thus, it may be imperative to consider lower body composition as a potential risk factor for osteoporosis in the care of these individuals.

**Keywords:** Primary osteoporosis, quality of life, body composition, bone density



## NUTRIENT PROFILE MODELS' APPLICATION TO FOOD ADVERTISEMENTS AND FOOD MARKETING VIA TELEVISION FOR CHILDREN: A SYSTEMATIC REVIEW

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**Background and Aim:** In order to prevent non-communicable diseases such as obesity and diabetes, the World Health Organization has published recommendations for classifying food into healthy and unhealthy groups. One of which is Nutrient Profile Model (NPM).

**Methods:** This comprehensive systematic review study was conducted based on PRISMA. 23 articles were included in the present systematic review by searching for appropriate keywords in Scopus, PubMed, Web of Science, and Google Scholar and after removing duplicates and screened in the Endnote software. The methodological quality of the selected studies was evaluated using the JBI Critical Appraisal Tools.

**Results:** The results of the present study showed that according to the application of NPM, most of the children's foods and beverages advertised on television are not healthy. Also, many sweet beverages and unhealthy foods are advertised with health claims, which many studies recommended should not be marketed to children and should be avoided.

**Conclusion:** NPM can be used as an appropriate tool and guideline in governments to establish appropriate laws for food producers and food labeling as well as their advertisements through television. In this way, the amount of healthy food consumption will increase and as a result, the amount of non-communicable diseases in the communities will decrease.

**Keywords:** nutrient profile model, marketing, advertisement, children



## MEDIUM-CHAIN TRIGLYCERIDES EXERT HEPATOPROTECTIVE AND THERAPEUTIC EFFECTS IN NAFLD-INDUCED RATS BY IMPROVING LIPID METABOLISM AND PREVENTING INFLAMMATORY RESPONSES THROUGH RECRUITING PHOSPHORYLATED AMPK

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**Background and Aim:** Medium-chain triglycerides (MCTs) have been suggested as effective strategies for treating a wide range of metabolic diseases. Here, we aimed to evaluate MCTs' preventive and therapeutic effects in rats with non-alcoholic fatty liver disease (NAFLD).

**Methods:** Thirty-six male Wistar rats were divided into preventive and therapeutic groups, in which rats were fed a high-fat diet for 6 to 8 weeks, respectively. In the preventive group, NAFLD-induced rats were given Capridin (Caprylate+Caprate: formulation of medium-chain fatty acids that induces ketogenesis) alongside their high-fat diet, while rats in the therapeutic group consumed a high-fat diet for six weeks and then had Capridin for the following two weeks. Serum levels of biochemical parameters, inflammatory-related cytokines, and alterations in the gene expression levels were then evaluated.

**Results:** Our results suggested that the Capridin was effective, in both prevention and treatment models tested, for counteracting the devastating effects of a high-fat diet on the hepatocytes. Consumption of Capridin reduced body weight, reduced lipid accumulation in the hepatocytes, and improved the function of hepatic mitochondria. Furthermore, the Capridin consumption increased adiponectin and AMPK in both experimental models.



Capridin improves fatty acid oxidation and prevents inflammation by increasing the adiponectin level and, consequently, the recruitment of AMPK and PPARs.

**Conclusion:** it could be proposed that Capridin could probably be a promising strategy for patients suffering from NAFLD; however, further evaluations are required to study the side effects of this diet.

**Keywords:** Non-alcoholic fatty liver disease; Medium-chain triglycerides; inflammation; AMPK; PPARs



## THE EFFECT OF PROBIOTIC SACCHAROMYCES BOULARDII SUPPLEMENTATION ON SOME CLINICAL AND PARA-CLINICAL FINDINGS OF PATIENTS WITH MULTIPLE SCLEROSIS

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**Background and Aim:** Multiple Sclerosis (MS) is a chronic demyelination disease of the central nervous system (CNS). Recent research has shown a link between the gut microbiota and the central nervous system as the gut-brain axis, which involves communication between the nervous, endocrine, and immune systems. We aimed to evaluate the impact of probiotic *Saccharomyces boulardii* (SB) containing 250 mg of SB (1010 CFU) compared to the placebo on mental health, fatigue, pain, quality of life, and inflammatory and oxidative stress indicators in patients with MS.

**Methods:** This study was conducted as a 4-month prospective randomized double-blinded clinical trial among MS patients with a documented diagnosis of Relapsing–remitting MS (RRMS) referred to outpatient specialized and subspecialty clinics of Tabriz University of Medical Sciences from June 2021 to March 2022. The eligible patients were randomly assigned to probiotic or placebo groups after a two-week wash-out period, with a 1:1 allocation ratio after baseline assessment. During the washing phase, patients were instructed to refrain from consuming probiotics such as yogurts with live active cultures, supplements, or any other dietary supplement, except for vitamin D3. A trained statistician used Random Allocation Software for a randomized assignment, stratified based on participants' body mass index, age, and type of medication. All patients continued their routine treatments for multiple sclerosis during the study. Acetaminophen tablets were permitted for pain relief, up to 2 g daily. However, we advised patients to avoid taking other anti-inflammatory analgesics or NSAIDs. The study's primary outcome was the differences in mental health changes between the two groups due to the intervention. The secondary outcomes were the mean difference in changes in fatigue, pain, quality of life, and biochemical parameters between the two groups. Ultimately, 50 patients were enrolled in the trial. Five patients from each group were lost to follow-up, and 40 patients completed the test and were included in the final analysis. The mean age in the probiotics and placebo groups was  $33.80 \pm 1.37$  and  $34.95 \pm 7.03$  years, respectively. Both groups had similar demographic and clinical parameters at baseline. The results showed that the SB significantly decreased the inflammatory marker high-sen-



sitivity C-reactive protein compared to the placebo ( $P < 0.001$ ). The serum antioxidant capacity also increased significantly in the probiotic group compared to the placebo ( $p = 0.004$ ). There was no significant difference between the two groups regarding the serum malondialdehyde. Pain intensity and fatigue severity significantly decreased in the probiotic group compared to the placebo ( $p = 0.004$  and  $p = 0.01$ , respectively). The probiotic group experienced significant improvement in some quality of life scales (measured by a 36-Item Short Form Survey) and somatic and social dysfunction subscale of General Health Questionnaire scores compared to the placebo group ( $p = 0.01$ ). Probiotics were well tolerated, and the patients reported no serious adverse effects or were recognized by the physicians. Compliance was high (greater than 95%). Of the 40 patients who completed the 4-month trial, the most common adverse effects included constipation (12.5%), weight gain (12.5%), nausea (10.0%), and worsened fatigue (5%). No patients showed evidence of MS relapse.

**Conclusion:** The present study was the first to investigate the effects of SB, a probiotic, on inflammatory markers and oxidative stress indicators in patients with MS. The findings of this study suggest that SB may be a valuable adjunct therapy for controlling clinical symptoms, inflammation, and oxidative stress in MS patients. The probiotic's potential to improve mental health, fatigue, quality of life, and pain also highlights its valuable role in managing MS neuropsychological Symptoms. Further studies are to understand the probiotics' thorough mechanisms of action and their long-term effects.

**Keywords:** Multiple Sclerosis; *Saccharomyces boulardii*; fatigue; quality of life; biochemical parameters



## ANALYSIS AND EVALUATION OF THE “IMPROVING NUTRITION OF RURAL AND TRIBAL WOMEN” PROGRAM IN RURAL AREAS OF TEHRAN PROVINCE, IRAN

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**Background and Aim:** In Iran, the program entitled “Nutrition Improvement of Rural and Nomadic Women was implemented for a period of five years, since 2017. The current study was conducted to analyze and evaluate the program.

**Methods:** The analysis of the program was done retrospectively, using the policy triangle framework. In this regard, data was gathered from documents (n=210), in-depth semi-structured interviews (n=40) and focus group discussions (n=8). The process evaluation of the study was performed using the Medical Research Council (MRC) guidance. Also, a cross-sectional study was conducted to assess program outcomes on 313 rural women from 32 villages in the five counties of Tehran province. To analyze the data, the MAXQDA 2020; the Excel 2013 and IBM SPSS 21 software were used.

**Results:** The findings of the study indicated some weaknesses in program implementation including: needs assessment, Intra- and inter-sectoral cooperation, resources and facilities, sustainability and expansion of the program, monitoring and evaluation. The results didn't show a significant difference in the quantity (kilograms) and variety (type) of produced vegetables by the covered women, and also other assessed outcomes such as nutritional knowledge, household food security, dietary diversity and women's empowerment between the group covered by the program and control group.

**Conclusion:** Based on the results, the current evaluated program has not been able to achieve its objectives. So, improving the implementation of the program, addressing its weaknesses and contextual barriers may be necessary.

**Keywords:** homestead food production, process evaluation, program analysis, policy Triangle Framework





## IMMUNOMODULATORY, ANTI-INFLAMMATORY, ANTIOXIDANT AND CLINICAL RESPONSES TO ZINC GLUCONATE SUPPLEMENTATION IN PATIENTS WITH BEHCET'S DISEASE: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED CLINICAL TRIAL

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**Background and Aim:** Toll-like receptor (TLR) 2 and 4 and NLRP3 inflammasome are involved in the pathogenesis of Behçet's disease (BD). The current study aimed to investigate the effect of zinc supplementation on TLR-2/4 expression, NLRP3 inflammasome, C-reactive protein (CRP), malondialdehyde (MDA) levels, and BD activity.

**Methods:** In this double-blind placebo-controlled randomized clinical trial, 50 BD patients were randomly allocated into either zinc gluconate (30 mg/day) or placebo groups for 12 weeks. Before and after the intervention, the surface and mRNA expression level of TLR-2 and TLR-4, the mRNA expression of NLRP3 and caspase-1 in the leukocytes, serum level of zinc, tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), interleukin-beta (IL-1 $\beta$ ), CRP, MDA, quality of life, anthropometric measures, blood pressure, and BD activity of patients were collected.

**Results:** Real-time PCR and flowcytometry results showed that there was a significant decrease in TLR-2 mRNA ( $P=0.038$ ) and protein expression ( $P=0.034$ ), NLRP3 ( $P=0.046$ ) and caspase-1 ( $P=0.003$ ) genes expression. Moreover, zinc supplementation led to an improvement in BD activity score ( $P=0.046$ ), serum level of IL-1 $\beta$  ( $P=0.046$ ), CRP ( $P=0.012$ ), and zinc ( $P<0.001$ ) in the zinc group compared to placebo. Zinc supplementation significantly decreased the TLR-4 surface ( $P=0.012$ ) and mRNA expression ( $P=0.028$ ) within the group. However, this decrease was not significant compared to the placebo group. There was no significant difference between the two groups regarding the serum level of TNF- $\alpha$ , MDA, quality of life, anthropometric measures, and blood pressure ( $P>0.05$ ).

**Conclusion:** The present study revealed that zinc supplementation has immunomodulatory and anti-inflammatory effects on BD patients resulting in an improvement in BD activity.

**Keywords:** Zinc; anti-inflammatory; antioxidant; Immune system; Behcet syndrome



## THE EFFECTS OF POST-BIOTIC BUTYRATE SUPPLEMENTATION ON THE EXPRESSION OF CLOCK AND BMAL1 GENES IN PATIENTS WITH ACTIVE ULCERATIVE COLITIS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Post-biotic butyrate is proposed as effective in managing ulcerative colitis (UC), specifically in regulating circadian-clock genes through its histone deacetylase function, which are commonly downregulated in UC. This study aimed to explore the impact of sodium butyrate supplementation for the first time on the expression of circadian-clock genes CLOCK and BMAL1 in individuals with active UC.

**Methods:** In this recent randomized controlled trial, 36 individuals diagnosed with active UC were randomly assigned to receive either sodium butyrate (600 mg/kg) or a placebo for a duration of 12 weeks. Ethical approval from the Research Ethics Committee of Shiraz University of Medical Sciences (reference number: IR.SUMS.SCHEANUT.REC.1400.037) was obtained before enrolling the initial participant for this study. The evaluation of circadian clock genes CLOCK and BMAL1 was conducted using real-time polymerase chain reaction (qPCR) on white blood cells (WBC). Changes in gene expression were represented as fold changes in expression ( $2^{-\Delta\Delta CT}$ ), relative to the baseline, which was normalized to  $\beta$ -actin, utilized as the reference gene. The data were analyzed using SPSS version 23. An independent sample t-test was employed to compare between groups. A p-value of  $\leq 0.05$  was considered statistically significant.

**Results:** The expression level of BMAL1 was over two-fold higher in the butyrate group compared to its expression in the placebo group (BMAL1 fold change: 1.85 (0.97) vs. 0.86 (0.63), p-value = 0.003), with no observed effect on CLOCK gene expression.

**Conclusion:** The supplementation of butyrate, alongside standard medication, might prove to be an effective treatment for modulating circadian clock genes in the active UC patients.

**Keywords:** Post-biotic; Short-chain fatty acids; Butyrate; Circadian-clock genes; Ulcerative colitis



## EFFECTIVE DIET IN THE TREATMENT OF LEUKEMIA: STUDY OF APOPTOSIS FOLLOWING THE EFFECT OF CARDAMOM EXTRACT IN AML LEUKEMIA OF RATS

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**Background and Aim:** Recent laboratory research on blood cancers shows that cardamom extract has anticancer properties on the culture of cells derived from blood cancer carcinoma of different types such as AML. The inhibitory effect of this extract was around 80-100%. The aim of this study is to evaluate the apoptosis of hematopoietic stem cells(HSCs) in the bone marrow following treatment with cardamom extract.

**Methods:** In this experimental study, 56 male Wistar rats aged 12 weeks and weighing 200-300 grams were selected and divided into two equal treatment and control groups. To induce AML leukemia, the carcinogen 1,2-dimethylhydrazine was used in the amount of 40 mg/kg by subcutaneous injection method (3 injections per week, for 3 weeks). In addition to receiving the carcinogen, the treatment group received 400 mg/kg cardamom extract orally daily for 10 weeks. After 10 weeks, the bone marrow tissue of both groups was sampled by biopsy method to prepare 3-4 micron sections and perform tunnel staining.

**Results:** Immunohistochemical studies showed that the phenomenon of apoptotic cells in the treatment group was more than the control group and the difference in the mean of both groups was statistically significant ( $p < 0.01$ ). Also, the conversion rate of long-term hematopoietic stem cells(LT-HSCs) to short-term hematopoietic stem cells(SL-HSCs) was surprisingly changed and improved.

**Conclusion:** The present study showed that marigold extract has the ability to induce apoptosis of dysplastic cells in rat blood cancer in a significant way and it seems that it can be used as a supportive treatment in blood cancer patients in their diet. Everyday and routine, to be included.

**Keywords:** "Diet"; "Leukemia"; "Cardamom extract"; "Supportive treatment of leukemia"



## EFFECT OF A COMPREHENSIVE NUTRITION EDUCATION PROGRAM ON NUTRITIONAL BEHAVIOR AND FOOD SECURITY OF FEMALE-HEADED HOUSEHOLDS WHO RECEIVE WELFARE SUPPORT IN ZANJAN PROVINCE

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**Background and Aim:** In recent years, the food security and dietary quality of many Iranian families have deteriorated due to unprecedented inflation. Nutrition education programs can be an effective and inexpensive method to improve food quality and security. The present study aimed to investigate the effect of a comprehensive nutrition education program for low-income women who are heads of households and are covered by the Zanjan province's welfare.

**Methods:** The food security of 2600 female-headed households covered by the Welfare of Zanjan province was evaluated using a standard 6-item questionnaire. A total of 600 women with the highest food insecurity scores were selected for the comprehensive nutrition education program. The participants received six sessions of 1.5 h of courses about how to improve the quality of their diets and manage their budgets and be physically active. At the beginning of the study and one month after the completion of the intervention, the participants were asked to complete a questionnaire designed and validated by the investigators. The scores of each section before and after the intervention were compared using paired t-test method and p values of  $<0.05$  were considered statistically significant. The prevalence of severe food insecurity among female-headed households who receive welfare support in Abhar, Khodabandeh, and Zanjan cities was 59.5%, 75%, and 62%, respectively. A total of 505 participants successfully completed the courses. After completion of the educational intervention, diet quality, physical activity, budgeting, and food safety scores of the participants increased by 6%, 4%, 4%, and 5%, respectively, which were statistically significant ( $p < 0.001$ ). However, no significant difference was observed in the food insecurity scores.

**Conclusion:** The comprehensive nutrition education program without financial or nutritional support can have a small but significant impact on the improvement of the nutritional behaviors and dietary quality of low-income people.

**Keywords:** Nutrition education, Food security, Food safety, Physical activity, Low-income families



## THE IMPACT OF ZINC SUPPLEMENTATION ON GALECTIN-3 AND METABOLIC MARKERS IN DIABETIC PATIENTS ON HEMODIALYSIS: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL

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**Background and Aim:** There is little information about the association between zinc sulfate (ZnSO<sub>4</sub>) supplementation and metabolic profiles in zinc-deficient diabetic patients on hemodialysis (DHPs). Therefore, we aimed to investigate the association between ZnSO<sub>4</sub> supplementation and serum levels of galectin-3 (Gal-3) and cardiometabolic parameters in zinc-deficient DHPs.

**Methods:** In the present randomized double-blind placebo-controlled clinical trial, 46 zinc-deficient DHPs (35–62 years) were included and assigned to receive either 220 mg/d ZnSO<sub>4</sub> or placebo for 8 weeks. Serum levels of Gal-3, lipid profile, and blood pressure (BP) were assessed at baseline and the end of trial.

**Results:** We found a significant effect of ZnSO<sub>4</sub> intake on the reduction of serum Gal-3 ( $P < 0.001$ ), triglycerides ( $P < 0.001$ ), total cholesterol ( $P < 0.001$ ), low-density lipoprotein cholesterol ( $P < 0.001$ ) and increased high-density lipoprotein cholesterol ( $P < 0.001$ ) as compared to the control group. Additionally, systolic blood pressure (SBP) ( $P = 0.006$ ) and diastolic blood pressure (DBP) ( $P = 0.01$ ) were significantly reduced following 8 weeks of ZnSO<sub>4</sub> supplementation.

**Conclusion:** Taken together, 220 mg ZnSO<sub>4</sub> supplementation per day for 8 weeks among zinc-deficient DHPs had beneficial effects on Gal-3 and metabolic profiles.

**Keywords:** Zinc, Diabetic nephropathy, Galectin-3, Cardiometabolic parameters.



## **BODY MASS INDEX, DIETARY FIBER AND DOCOSAHEXAENOIC ACID INTAKE PREDICTS ONE-YEAR RELAPSES IN MULTIPLE SCLEROSIS PATIENTS: USING MACHINE LEARNING MODELS**

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**Background and Aim:** The aim of this study is to investigate the usefulness of artificial intelligence with machine learning to develop a model for predicting relapses in patients with multiple sclerosis.

**Methods:** In the present study, patients with multiple sclerosis were followed up for one year. Monthly anthropometric measurements, food intake, multiple sclerosis relapses, fasting blood glucose and lipid profile were recorded for one year and used to build models based on common machine learning algorithms (including support vector machine, random forest and logistic regression).

**Results:** A total of 302 patients with multiple sclerosis were included in the study, 96.3% of whom were women. In total, 3 models achieved an AUROC (area under the receiver operating characteristic) above 0.8 and 5 factors achieved an AUROC above 0.7. Among the factors identified, the most important risk factors for predicting the occurrence of relapses in patients with multiple sclerosis are body mass index, fiber intake and docosahexaenoic acid intake. Other important factors are the intake of vitamin D, carbohydrates and saturated fatty acids as well as serum levels of fasting blood glucose and high-density lipoprotein.

**Conclusion:** It appears that the most cost-effective method in clinical practice for predicting relapses in MS patients is the use of machine learning prediction models. All eight identified algorithms can be used to predict one-year relapses in patients. By optimizing the identified and validated models in further studies, this method can be used in the healthcare system as an intelligent decision support tool.

**Keywords:** Multiple Sclerosis, Relapses, Body Mass Index, Dietary intake, DHA, Fiber.



## EFFECTS OF SYNBIOTIC YOGURT CONSUMPTION ON METABOLIC PARAMETERS, OXIDATIVE STRESS, ATHEROGENIC RISK FACTORS, INFLAMMATION AND GENE EXPRESSION OF LIPID METABOLISM INDICATORS IN ADULTS WITH METABOLIC SYNDROME: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** This study aimed to develop synbiotic yogurt (SYN-Y) to identify new therapeutic interventions and evaluate health outcomes in metabolic syndrome (MetS) patients.

**Methods:** Forty-four individuals were randomly assigned to receive either 300 grams of synbiotic yogurt or a placebo daily for 12 weeks in this double-blind, randomized, placebo-controlled clinical experiment. Biochemical and anthropometric variables were compared both before and after the intervention. Accordingly, Metabolic Parameters were measured in this study, along with expression levels of inflammation markers, inflammatory factor NF- $\kappa$ B, and genes involved in lipid metabolism (PPAR- $\gamma$  and LDL-R), complete blood cells (CBC) count, serum levels of liver enzymes, Oxidative Stress, Atherogenic Risk Factors, urea, and creatinine.

**Results:** Receiving synbiotic yogurt caused a significant decrease in waist-to-hip ratio (WHR) ( $P=0.02$ ), systolic blood pressure ( $p=0.008$ ), serum levels of fasting blood glucose (FBG) ( $p=0.005$ ), fasting insulin ( $p=0.001$ ), Glutathione Peroxidase (GPx) ( $P=0.01$ ), Total Oxidative Status (TOS) ( $P=0.006$ ), homeostatic model assessment for insulin resistance (HOMA-IR) index ( $p<0.001$ ), TNF- $\alpha$  ( $P=0.001$ ) and interleukin-6 (IL-6) ( $P=0.01$ ) in the synbiotic yogurt group. Compared to the control group, it decreased significantly at the end of the trial. Also, no significant changes were observed in the expression of PPAR- $\alpha$ , NF- $\kappa$ B, and LDL-R genes and blood levels of atherogenic risk variables following consumption of synbiotic yogurt.

**Conclusion:** These findings indicate that SYN-Y consumption could improve some risk factors related to MetS. We are now better positioned to recommend the consumption of SYN-Y for the reduction of many chronic diseases. Iranian Registry of Clinical Trials (IRCT20220426054667N1, IRCT20170202032367N6)

**Keywords:** Metabolic syndrome, Inflammatory biomarkers, Gene expression, Probiotics.



## HOW ARE DIETARY PATTERNS ASSOCIATED WITH DIETARY INFLAMMATORY INDEX, SYSTEMIC INFLAMMATION, AND INSULIN RESISTANCE IN APPARENTLY HEALTHY INDIVIDUALS WITH OBESITY?

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**Background and Aim:** Inflammation is considered a significant factor leading to obesity. The impact of dietary patterns and specific food items on inflammation has been studied to a limited extent. Thus, the present study aimed to examine the connections between different dietary patterns and the dietary inflammatory index (DII), systemic inflammation, and insulin resistance (IR) in apparently healthy individuals with obesity.

**Methods:** In this cross-sectional study, 151 subjects with abdominal obesity were recruited from Northwest region of Iran. Dietary intake, demographic information, anthropometric measurements, and physical activity levels were assessed. DII scores were calculated using a validated 168-item food frequency questionnaire (FFQ). Three dietary patterns were identified using principal component analysis: Healthy, Western, and Traditional. Baseline blood samples were collected to analyze biochemical parameters. Data analysis involved the application of linear regression tests with adjusted beta estimates

**Results:** Western dietary pattern was positively associated with body mass index (BMI) ( $p < 0.01$ ) and fat mass ( $p < 0.001$ ). Conversely, Healthy dietary pattern showed a negative association with serum lipopolysaccharide-binding protein (LBP) ( $b = -0.1$ ,  $p < 0.04$ ) after accounting for confounding factors. Traditional dietary pattern was found to be inversely related to DII ( $b = -0.3$ ,  $p < 0.001$ ). Furthermore, adherence to Traditional dietary pattern was associated with lower odds of IR (Odds Ratio: 0.3, 95% Confidence Interval 0.1-0.9).

**Conclusion:** These findings suggest that Western dietary pattern is linked to higher BMI and fat mass, while the Healthy pattern is associated with reduced levels of LBP. Adhering to the Traditional dietary pattern is inversely related to DII and IR.

**Keywords:** Dietary pattern; DII; Western dietary pattern; Inflammation; Food pattern; Dietary Inflammatory Index





## THE EFFECTS OF FOOD PRICE POLICIES (TAXES AND SUBSIDIES) ON PROMOTING HEALTHIER DIET IN IRANIAN HOUSEHOLDS AND COST-EFFECTIVENESS ANALYSIS OF THE POLICIES

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**Background and Aim:** Our objective was to assess the impact of price changes on household food demand in Iran and evaluate the cost-effectiveness of related policies.

**Methods:** The present study was conducted using household income and expenditure data from 1990 to 2020. The consumption behavior and demand of the households were estimated using the Almost Ideal Demand System (AIDS). Then, the welfare change to consumers is estimated using the Compensating Variation (CV) measure. Finally, the cost effectiveness of implementing the selected scenarios was conducted in a population of one million people in 2019.

**Results:** The own-price elasticities obtained on the 6 food were in the range of -0.37 to -1. The most welfare lost in all income tertiles was observed in the 25% sugar tax scenario. The cost effectiveness evaluation of the study scenarios showed that the number of years prevented from death and disability (DALY) in each of the study scenarios was 322.9, 1121.5, 312.2, 570.3, 642.7 and 1027/5 respectively. The incremental cost-effectiveness ratio (ICER) of each scenario was 2.278, 0.89, 1.46, 0.49, 0.28, and 0.21 billion Rials per DALY prevented, respectively. The obtained ICER were compared with the standard GDP per capita in 2019 and the results showed that, except for the vegetable subsidy scenario, the rest of the scenarios were cost effective.

**Conclusion:** The use of price policies in Iran with the aim of changing the food behavior of households has good cost effectiveness in subsidies on fruits and legumes, as well as taxes on sugar and sweets, solid fats and SBs.

**Keywords:** Price policies, Subsidy, Tax, Cost-Effectiveness, Iran



## INDIVIDUAL AND COMBINED ASSOCIATIONS OF MACRONUTRIENT QUANTITY AND QUALITY WITH THE INCIDENCE OF TYPE 2 DIABETES

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**Background and Aim:** This study aimed to investigate the associations between the quantity and quality of macronutrients and T2D occurrence.

**Methods:** This cohort study consisted of 2457 T2D-free adults who participated in the Tehran Lipid and Glucose Study and were followed for a median of 8.6 years. Macronutrient quality index and its sub-indices (carbohydrate quality index, fat quality index, and protein quality index) and macronutrient quantities were calculated. Individual and combined associations of macronutrient quantity and quality with risk of T2D were examined using Cox proportional hazard models adjusted for known risk factors.

**Results:** During the study follow-up, 257 incident cases of T2D were documented. The highest tertile of macronutrient quality index and carbohydrate quality index had 27% (95% CI = 2, 46%) and 29% (95% CI = 1, 49%) lower T2D risk than the lowest tertile. T2DM incidence was 35% (95% CI = 11, 53%) lower in the middle protein quality index tertile than in the lowest. The multivariable model showed that individuals in the middle tertile of carbohydrate intake had a 32% (95% CI = 5, 51%) lower risk of T2DM than those in the lowest tertile. A high-quantity, high-quality carbohydrate diet ( $\geq 58.5\%$  of energy from carbohydrate with a carbohydrate quality index  $\geq 13$ ) and a low-glycemic index, high-fiber diet (glycemic index  $< 55$  and fiber  $\geq 25$  g/d) were related to a reduced risk of T2D.

**Conclusion:** A higher carbohydrate-quality diet may be associated with a lower incidence of T2D, especially when the proportion of carbohydrates is high.

**Keywords:** Carbohydrates, carbohydrate quality index, fat quality index, protein quality index, fiber, glycemic index



## EFFECTS OF SPIRULINA (*ARTHROSPIRA PLATENSIS*) SUPPLEMENTATION ON DISEASE ACTIVITY, BOWEL HABITS, ANTIOXIDANT STATUS, AND SERUM PENTRAXIN 3 LEVELS IN PATIENTS WITH ULCERATIVE COLITIS: A DOUBLE-BLIND, PLACEBO-CONTROLLED RANDOMIZED TRIAL

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**Background and Aim:** We conducted a randomized placebo-controlled trial to assess the efficacy of Spirulina (SP) supplementation on disease activity, bowel habits, antioxidant status, and serum pentraxin 3 (PTX-3) levels in patients with ulcerative colitis (UC).

**Methods:** Eighty patients with UC were randomly assigned to consume either one g/day (two 500 mg capsules/day) of SP (n=40) or control (n=40) for eight weeks. Dietary intakes, physical activity, disease activity, bowel habits, antioxidant status, erythrocyte sedimentation rate (ESR), and serum PTX-3 levels were assessed and compared between groups at baseline and post-intervention. Seventy-three patients (91.3%) completed the trial. We observed increases in serum total antioxidant capacity levels in the SP supplementation group compared to the control group after eight weeks of intervention ( $p \leq 0.001$ ). Moreover, stool frequency scores improved ( $p = 0.01$ ) in the SP supplementation group compared to the control group. There were no differences between groups in other bowel habits and disease activity parameters ( $p > 0.05$ ). Similarly, changes in ESR and PTX-3 levels were comparable between groups post-intervention ( $p > 0.05$ ).

**Conclusion:** SP improved antioxidant capacity status and bowel habits in patients with UC. Our findings suggest that SP supplementation may be effective as an adjuvant treatment for managing patients with UC. Larger trials with longer intervention periods are required to confirm our findings.

**Keywords:** spirulina, ulcerative colitis, clinical trial



## A DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL RELATED TO THE EFFECTS OF MELATONIN AND/OR MAGNESIUM ON OXIDATIVE STRESS AND INFLAMMATORY PARAMETERS OF WOMEN WITH POLYCYSTIC OVARY SYNDROME

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**Background and Aim:** Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders among women of reproductive age. The aim of this study was to assess the effects of melatonin and/or magnesium supplementation on inflammatory and oxidative stress parameters in women with PCOS.

**Methods:** In an 8-week randomized double-blind placebo-controlled trial, 84 subjects with PCOS aged 18–40 years were randomly assigned based on the random block procedure to take magnesium, melatonin, magnesium plus melatonin, and placebo. Fasting blood samples were obtained at the beginning and end of the study.

**Results:** After intervention, Magnesium-melatonin co supplementation resulted in more reductions in hirsutism compared with other groups ( $P < 0.001$ ). Serum levels of tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) reduced significantly in the melatonin and co-supplementation groups compared to baseline ( $P < 0.05$ ). Also, magnesium plus melatonin was associated with a more increase in total antioxidant capacity (TAC) levels, as compared to the other treatment groups ( $P = 0.001$ ).

**Conclusion:** Overall, we found a favorable effect of co-supplementation of magnesium and melatonin for 8 weeks in women with PCOS on hirsutism, serum TNF- $\alpha$ , and TAC levels. Furthermore, melatonin independently contributed to decreased serum values of TNF- $\alpha$ .

**Keywords:** Melatonin, Magnesium, Inflammation, Oxidative stress, Polycystic ovary syndrome



## Oral Formulation of New Peptide: Innovative approach for Metabolic syndrome and diabetes

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**Background:** Peptides play an important role in the treatment of chronic diseases. Oral administration of peptide is a promising strategy for diabetes mellitus. We used innovative oral peptide in treatment of fatty liver in metabolic syndrome.

**Material and Methods:** A double-blind, placebo-controlled, parallel group, randomized clinical trial with 12-week follow-up in adults with metabolic syndrome patients with fatty liver disease.

**INTERVENTIONS:** Participants received placebo or ProGsterol, orally administered twice daily for 12 weeks.

**MAIN OUTCOMES AND MEASURES:** Change from baseline in fatty liver grading, glycated hemoglobin (HbA1c), fasting plasma glucose (FPG), HOMA IR, MBI and WHR were assessed at week 12. Safety was monitored throughout the study period.

**Results:** We enrolled 150 participants (75 in each group). Data from analysis for 1 month shows that HOMA-IR, BMI, WHR were statistically significantly reduced at week 4. ( $P < 0.05$ ). Fatty liver grades were changed significantly from baseline in treatment group ( $P < 0.05$ ). No clinically important side effects were found in each group.

**Conclusion:** ProGsterol improved clinical and laboratory outcomes in patients with metabolic syndrome with fatty liver specially for weight management and weight loss purposes. ProGsterol is well tolerated without any side effects.



## Effect of Co-administration of Curcumin and Genistein Supplements on Features of Metabolic Syndrome and Inflammatory Parameters in High-Fat Diet-induced Obese Rats

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**Background and Aim:** The aim of the present study was to evaluate the effects of co-administration of curcumin (Cur) and genistein (Gen) supplements on the development of metabolic syndrome in obese rats.

**Methods:** Rats were randomly assigned into five groups of nine animals per group. Metabolic syndrome was induced by a high fat diet (HFD). The controls (group I) received a standard chow diet; group II received a HFD (40% of calories as fat), group III, IV and V rats were given group II diets with administration of Cur (0.2%), Gen (0.2%), and Cur+Gen for 8 weeks, respectively.

**Results:** At the end of 8 weeks, Cur, Gen, and Cur+Gen treatments, significantly ( $p < 0.05$ ), reduced body weight, blood glucose, insulin, triglycerides (TG), alanine aminotransferase (ALT), creatinine (Cr), malondialdehyde (MDA) level, and liver weight with the maximum reduction observed in the Cur+Gen group compared with other treatment groups. Treatment with Cur, Gen, and Cur+Gen did not affect spleen weight, HDL-C, LDL-C, aspartate aminotransferase (AST), alkaline phosphatase (ALP), blood urea nitrogen (BUN) level in HFD rats significantly ( $P > 0.05$ ). Only the Cur+Gen decreased high sensitivity C-reactive protein (hs-CRP), interleukin-6 (IL-6), cholesterol concentrations, and kidney weight compared with the HFD control groups significantly ( $P < 0.05$ ).

**Conclusion:** Co-administration of curcumin and genistein supplements is effective in improving metabolic profile in a rat of metabolic syndrome model.

**Keywords:** Curcumin, Genistein, metabolic syndrome, high fat diet, rats



## WHAT ARE THE BEST NUTRITION POLICIES TO PREVENT NCD IN IRAN? AN EXPERT'S OPINION

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**Background and Aim:** Prioritizing and identifying the best nutritional policies for preventing and controlling non-communicable diseases (NCDs)

**Methods:** A Delphi study was used to prioritize policy options in preventing the burden of NCDs among health managers and other experts in health and nutrition policymaking. The experts were asked to prioritize policy options with regard to feasibility, implementation costs, stability, and acceptance by the authority and society on a 5-point Likert scale scoring. Data were analyzed using basic descriptive statistical tests and expressed as mean, median, interquartile rate (IQR). (An IQR < 1 was used to indicate consensus. Also, the highest mean and lowest dispersion index indicated an option as high priority.

**Results:** The expert achieved consensus on "principles of healthy eating" courses in the curriculum of students as a high-priority policy option. In this regard, "promoting community education and customizing healthy food choice" was the next high priority policy option. On the other hand, the lowest policy priority option was "sending free/low-price healthy drinks at home". The three high priority policy categories were reformulating the content of food, enhancing the consumers' knowledge, and food labeling, respectively.

**Conclusion:** Reformulation, food promotion, and food labeling were the highest priorities for preventing NCDs in Iran, as revealed by our findings. Providing sub-structures for food product reformulation is crucial, despite the cost-effectiveness of food provision policies in developing countries like Iran.

**Keywords:** nutrition policy, NCD, expert, Delphi



## Chinese visceral adiposity index: a novel tool for screening liver fibrosis and steatosis; a cross-sectional study

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**Background and Aim:** Diagnosing liver fibrosis in the early stages can protect the patient from more advanced and irreversible stages of liver damage. We aimed to introduce an inexpensive tool with appropriate sensitivity and specificity to screen adults for liver steatosis and fibrosis.

**Methods:** 290 participants who met the inclusion and exclusion criteria were enrolled in the study. Inclusion criteria include age over 18 years, and exclusion criteria include considerable alcohol consumption, other liver diseases, steatogenic drugs, and a history of cancer in the last six months. Liver steatosis and fibrosis was measured by fibro scan by using probe M and XL. Using receiver operating characteristic (ROC) analysis and Youden's index, logistic regression, and pairwise comparison of ROC curves, optimal cut-off point, the odds ratio, and the superiority of each visceral marker were determined for liver steatosis and fibrosis, respectively.

**Results:** Chinese visceral adipose tissue (CVAI) of  $>107.07$  predicts S2-S3 female subjects with a sensitivity of 60.56% and specificity of 74.55% (AUC=0.712). CVAI of  $>104.40$  can detect female subjects with F1-F4 fibrosis with sensitivity of 65.96% and specificity of 64.56% (AUC=0.672). For each unit increase in CVAI value, the odds increased by 0.33 in males (p-value $<0.001$ ) and 0.14 in females (p-value=0.001) for steatosis, and by 0.01 in females (p-value=0.001) for fibrosis. CVAI is superior to visceral adipose index (VAI) (p-value=0.0004) and waist circumference (p-value = 0.005) in the steatosis prediction. CVAI is superior to VAI (p-value=0.02) in the fibrosis prediction.

**Conclusion:** CVAI is a proper diagnostic value for liver steatosis and fibrosis screening compared to VAI and WC.

**Keywords:** Chinese visceral adipose index, steatosis, fibrosis, predictive value, visceral fat





## ASSOCIATION OF DIET DIVERSITY SCORE WITH PRIMARY INSOMNIA: A CASE-CONTROL STUDY

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**Background and Aim:** Sleep research has focused extensively on insomnia, a prevalent sleep disorder affecting numerous individuals globally. Primary insomnia is marked by persistent difficulty in initiating or maintaining sleep, without any underlying medical cause. To explore the potential link between dietary diversity scores and primary insomnia among adults, this case-control study was conducted.

**Methods:** We analyzed data from a case-control study of 111 patients with primary insomnia and 333 controls. The dietary diversity score (DDS) was calculated based on data collected from 168-item validated food frequency questionnaire. The cases were selected based on neurologist diagnosis of moderate or severe primary insomnia using the Insomnia Severity Index (ISI) questionnaire. P-values < 0.05 were considered statistically significant.

**Results:** Individuals in the highest tertile of DDS were 42% less likely to have insomnia (OR=0.58; 95% CI: 0.34–0.99, P for trend=0.039), compared with those in the bottom category in the crude model. After adjusting for the potential confounding factors, there was a negative significant relationship between insomnia risk and DDS in the multivariable-adjusted model (OR=0.53; 95% CI: 0.28–0.99, P for trend=0.043).

**Conclusion:** Our findings indicated notable positive associations between DDS and the consumption of different food categories, such as non-whole grain bread, rice, pasta, fruits, vegetables, red meat and organ meat, poultry, fish, egg, milk and milk product, yogurt and yogurt product, and cheese and cheese product. A negative correlation was observed between DDS and the likelihood of experiencing insomnia, as the odds of insomnia decreased with increasing DDS tertiles.

**Keywords:** insomnia, nutrition, DDS, dietary diversity scores



## THE EFFECT OF VITAMIN C SUPPLEMENTATION ON LIPID AND LIPOPROTEIN CONCENTRATION OF HYPERLIPIDEMIC PATIENTS

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**Background and Aim:** The aim of this study was to determine the effect of vitamin C supplementation on plasma Total Triglyceride (TG), Total Cholesterol (TC), Low Density Lipoprotein-cholesterol (LDL-c), High Density Lipoprotein-cholesterol (HDL-c), Very Low Density Lipoprotein-cholesterol (VLDL-c) of hyperlipidemic patients.

**Methods:** One hundred and five hyperlipidemic patients had referred to Motahari clinic at Shiraz during August to February 2017 participated in this sequential clinical trial. At the beginning of the study, plasma Total Triglyceride, Total Cholesterol, Low Density Lipoprotein-cholesterol, High Density Lipoprotein-cholesterol, Very Low Density Lipoprotein-cholesterol and vitamin C concentrations were measured. Participants were asked to supplement their diet with one gram of vitamin C for six weeks (intervention period), and then didn't use vitamin C supplementation for the next six weeks (control period). After intervention and control periods blood indices (TC, TG, LDL-c, HDL-c, and VLDL-c) were measured and compared with baseline.

**Results:** Six weeks vitamin C supplementation in hyperlipidemic participants caused significant increase in plasma vitamin C, decrease in TG, TC, LDL-c, VLDL-c, LDL-c/HDL-c, while plasma HDL-c did not change. After control period blood levels of TG, TC, LDL-c, VLDL-c, and LDL-c/HDL-c returned to pre-intervention.

**Conclusion:** One gram vitamin C supplementation daily for six weeks may favorably alter the lipid and lipoprotein profile of hyperlipidemic participants.

**Keywords:** Vitamin C (ascorbic acid), supplement, blood lipid, lipoprotein, total cholesterol (TC), total triglyceride (TG), cardiovascular disease (CVD).



## EVALUATION OF THE RELATIONSHIP BETWEEN MALNUTRITION ACCORDING TO PNI AND INFLAMMATORY FACTORS (ESR-CRP-D DIMER) IN CORONA HOSPITALIZED PATIENTS IN HAMADAN IN 2020-22

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**Background and Aim:** The aim of this cross-sectional study is to investigate the relationship between malnutrition assessed by PNI (prognostic nutritional index) and inflammatory markers (ESR-CRP-D DIMER) in COVID-19 patients hospitalized in Hamedan city from 2022 to 2019.

**Methods:** In this cross-sectional study, 185 COVID-19 patients hospitalized at Sina Hospital were evaluated for their nutritional status using PNI. Inflammatory markers (ESR-CRP-D DIMER), disease severity according to the Berlin Definition scale, and patient outcomes in terms of hospital stay were extracted from patient records.

**Results:** Out of the 185 examined patients, 113 (61.1%) were female, 41 (22.2%) passed away before discharge, 43 (23.2%) had mild disease, 93 (50.3%) had moderate disease, and 49 (26.5%) had severe disease. The patients had an average age of  $50.8 \pm 9.2$  years, and their PNI was  $38.6 \pm 6.3$ , with 69 (37.3%) having a PNI score less than 38, indicating malnutrition. Spearman's correlation coefficient showed an inverse (negative) correlation between PNI and inflammatory markers ( $P < 0.001$  for all three markers). Logistic regression analysis revealed that after adjusting for age, disease severity, and inflammatory markers, an increase in PNI score was associated with a reduced chance of death ( $OR = 0.83$ ,  $CI_{95\%}: 0.74; 0.92$ ). The Kruskal-Wallis's test demonstrated a significant increase in disease severity with a decrease in PNI score ( $P < 0.001$ ) (mild:  $43.6 \pm 3.7$ , moderate:  $40.2 \pm 4.2$ , severe:  $31.2 \pm 5.5$ ).

**Conclusion:** Malnutrition in COVID-19 patients can lead to increased disease severity, elevated inflammatory markers, and worse prognosis. Therefore, it is essential to pay more attention to the better prognosis of these patients.

**Keywords:** COVID-19; Malnutrition; inflammatory markers; Prognosis



## ASSOCIATION BETWEEN NUTRITIONAL STATUS AND BIOCHEMICAL MARKERS AMONG HEMATOPOIETIC STEM CELL TRANSPLANT CANDIDATES: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Candidates of Hematopoietic Stem Cell Transplantation (HSCT) may be at nutritional risk due to decreased oral intake, high nutritional requirements and nutrient malabsorption. The aim of this study was to evaluate the association between nutritional status and blood biomarkers in candidates of HSCT.

**Methods:** A total of 278 patients aged 18–65 years old were recruited and their baseline demographic and clinical characteristics were recorded. All subjects underwent nutritional status analysis using Nutritional Risk Screening (NRS-2002). Blood biomarkers including C-reactive protein (CRP), Erythrocyte Sedimentation Rate (ESR), hemoglobin, albumin and total protein as well as CRP-albumin ratio (CAR) and Body Mass Index (BMI) were measured and compared between two groups based on Nutritional Risk Screening (NRS-2002) within 24 h of admission in Bone Marrow Transplant ward.

**Results:** The results showed that undernourished patients (NRS  $\geq$  3) had significantly higher inflammatory markers including ESR, CRP and CAR as well as lower BMI and serum albumin and hemoglobin concentrations ( $P < 0.05$ ); however, no significant association was observed in terms of total protein even after adjusting for confounders ( $P > 0.05$ ).

**Conclusion:** This study revealed that BMI combined with biochemical markers are the appropriate parameters for assessment of nutritional status in HSCT candidates. Furthermore, the nutritional status was verified to be significantly associated with systematic inflammation.

**Keywords:** Nutritional status, Blood biomarkers, Inflammation, BMI, HSCT



# Poster Presentations



## DIETARY PATTERNS AND ATTENTION DEFICIT HYPERACTIVITY DISORDER AMONG IRANIAN CHILDREN

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**Background and Aim:** Associations between nutritional/dietary factors and mental disorders have been suggested. This study was conducted to assess the relation of major dietary patterns determined by factor analysis with attention-deficit/hyperactivity disorder (ADHD) in a group of Iranian pre- and school-aged children

**Methods:** This case-control study was conducted on 500 pre- and school-aged children (4-12 years old) matched by age and sex, in Isfahan, Iran. Dietary intake was identified by a 168-item questionnaire, and major dietary patterns were identified by factor analysis. The multivariable logistic regression is used for the association of dietary patterns with the diagnosis of ADHD. ADHD diagnosis was carried out by the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Two major dietary patterns were identified: healthy and Western. The healthy dietary pattern was rich in fruits, vegetables, vegetable oils, whole grains, legumes, and dairy products. The Western pattern was rich in processed meat, red meat, pizza, eggs, snacks, animal fat, hydrogenated fat and salt. After controlling for potential confounders, children in the top quintile of the Western dietary pattern score had greater odds having ADHD, compared with those in the lowest quintile (OR: 3.45, 95% CI: 1.17-18.3, Ptrend=0.03). The healthy pattern was inversely associated with ADHD (OR: 0.46, 95% CI: 0.38-0.91, Ptrend=0.01).

**Conclusion:** A significant independent association was found between the Western dietary pattern and the odds of ADHD. The healthy dietary pattern was associated with lower odds of having ADHD. Prospective studies are needed to confirm these findings.

**Keywords:** Dietary patterns, Attention-deficit/hyperactivity disorder, School-aged children, Iranian



## EFFICACY OF PROPOLIS AS A BIOFLAVONOID SOURCE ON DIABETES MELLITUS: A REVIEW STUDY

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**Background and Aim:** Propolis, one of nature's richest bioflavonoid sources can speed up mending diabetes mellitus. Diabetes mellitus is a syndrome considered a chronic endocrine metabolic which causes oxidative stress. As reported by the World Health Organization it is estimated that by 2045, 10% of the world's population will suffer from this disease.

**Methods:** To select related articles, a systematic search was done on Scopus, PubMed, Web of Science, Science Direct, Irandoc, and Google Scholar from 2000 to 2023. The keywords were "propolis", "diabetes mellitus", and "honey bee products". Among n=1463 initially identified articles due to the exclusion and inclusion factors, 17 articles had the eligibility to be used in the current study.

**Results:** According to reviewed articles, generalized oxidative stress is the possible reason for most diabetes mellitus complications. Glucose oxidation and protein glycosylation produce free radicals in pancreatic  $\beta$ -cells that inhibit insulin secretion by demolishing  $\beta$ -cells and DNA changes. There are several recommended chemical remedies for diabetes mellitus especially for T2DM are sulfonylureas, glucagon-like peptide-1 agonists, HMG-CoA reductase inhibitors, and the most commonly used medication for diabetes mellitus control alpha-glycosidase by decreasing the absorption of monosaccharides in the intestine. It was reported that propolis has anti-diabetic and anti-hyperglycemia by neutralizing reactive oxygen species (ROS), inhibiting  $\alpha$ -glucosidase, translocation of GLUT-4, and increasing Apo A-1 (Increased HDL).

**Conclusion:** The results of studies showed that propolis has anti-hyperglycemia, anti-inflammatory, antioxidant, immunomodulatory, pancreas protective, anti-microbial, and antitumor properties. Furthermore, due to the propolis properties, it can be recommended as a functional food to reduce complications of diabetes and improve individual health.

**Keywords:** propolis, bioflavonoids, diabetes mellitus, anti-hyperglycemia, antioxidants





## THE EFFECT OF CONJUGATED LINOLEIC ACID (CLA) SUPPLEMENTATION IN COMPARISON WITH OMEGA-6 AND OMEGA-9 ON LIPID PROFILE: A GRADED, DOSE-RESPONSE SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Conjugated linoleic acid (CLA) is a geometrical isomer of linoleic acid, which has anti-inflammatory, anti-diabetic, anti-cancer, and anti-obesity properties. However, the studies reported inconsistent results about the CLA-related effects on lipid profiles. As a result, a meta-analysis and systematic review was performed to survey the CLA supplementation-related effect on lipid profile including high-density lipoprotein (HDL), low-density lipoprotein (LDL), total cholesterol (TC), and triglycerides (TG).

**Methods:** To identify the relevant research, a systematic comprehensive search was initiated on the medical databases Scopus and PubMed/Medline until December 2022. The overall effect size was estimated by weighted mean difference (WMD) and 95% confidence interval (CI), in a random effect meta-analysis. In the final quantitative analysis, the meta-analysis considered 35 randomized controlled trials (RCTs) with 1476 participants (707 controls and 769 cases).

**Results:** The pooled results demonstrated that CLA supplementation, compared to olive oil, significantly increased serum TG levels (WMD: 0.05 mmol/L; 95% CI: 0.01 to 0.1;  $P = 0.04$ ;  $I^2 = 0.0\%$ ,  $P = 0.91$ ). With regard to TC level, CLA supplementation compared to placebo significantly reduced TC concentrations (WMD: -0.08 mmol/L; 95% CI: -0.14 to -0.02;  $P < 0.001$ ;  $I^2 = 82.4\%$ ). Moreover, the non-linear dose-response analysis indicated a decreasing trend of TC serum level from the 15th-week duration of CLA supplementation compared to olive oil ( $P_{\text{non-linearity}} = 0.01$ ).

**Conclusion:** The present meta-analysis and systematic review of 35 RCTs showed that the CLA intervention was able to raise the level of TG in comparison with olive oil; however, it can decrease TC level compared to placebo and olive oil.

**Keywords:** high-density lipoprotein, conjugated linoleic acids, low-density lipoprotein, meta-analysis, triglycerides





## THE EFFECTS OF MONOSODIUM GLUTAMATE INTAKE ON SPERM PARAMETERS IN MALE RATS: A SYSTEMATIC REVIEW

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**Background and Aim:** Monosodium glutamate (MSG) is extensively used as a food additive in commercial food products. In recent years, there has been a growing concern regarding the impact of environmental factors on infertility, including nutrition. Given the rising infertility rates and the significant impact of diet on this issue, the objective of this review study was to determine the effect of MSG intake on sperm parameters in male rats.

**Methods:** This review was conducted by searching databases such as PubMed, ISI, Scopus, and Google Scholar using keywords specified in the Cochrane protocol. As there were no human intervention studies available, the research focused on examining the impact of monosodium glutamate consumption on sperm parameters in male rats.

**Results:** After evaluating the extracted studies, a total of 15 experimental studies published between 2011 and 2022 were considered. The findings consistently demonstrated a significant reduction in sperm count and concentration with higher doses of MSG. Moreover, MSG intake led to notable abnormalities in the morphology of rat sperm, including primary abnormalities such as round and two-headed sperm, as well as secondary abnormalities such as bent neck, curved tail, coiled tail, headless, and tailless sperm. The majority of the reviewed articles reported a decrease in sperm motility following exposure to MSG.

**Conclusion:** This study highlights that increased consumption of MSG in food leads to decreased sperm count, concentration, and motility, potentially contributing to higher rates of infertility in male rats. Consequently, the consumption of high and long-term doses of MSG can significantly impair sperm characteristics.

**Keywords:** "monosodium glutamate"; "male infertility"; "sperm disorders"; "food additive"



## INVESTIGATING THE EFFECT OF PROBIOTICS ON ALZHEIMER'S DISEASE AND DEMENTIA

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**Background and Aim:** Alzheimer's disease (AD) is the most common type of dementia characterized by neurofibrillary tangles (NFT), and its prevalence reaches 23% in people over 86 years old. Probiotics are living microorganisms that have a preventive role against cognitive decline in AD. The aim of this systematic study is to investigate the bacterial strains and the mechanism of action of probiotics in the prevention and treatment of AD.

**Methods:** This article is a short review study that was designed in 2023. By searching international and national databases, articles from 2020 to 2023 about probiotics, Alzheimer and dementia were collected. After reviewing the search results, finally 35 articles were used to write this study.

**Results:** The positive effects of probiotics on the central nervous system (CNS), are achieved by changing the intestinal microbiota and increasing the variety of beneficial bacteria. The most common probiotics belong to the genus *Lactobacillus* and *Bifidobacterium*, they cause production short-chain fatty acids, stimulate the brain-intestinal axis, and modulate the immune system. Also, by strengthening the neurotrophic factor, they cause the survival and differentiation of neurons. Probiotics change the biochemical components of the brain like serotonin and dopamine, they play a role in the treatment of memory deficits and restore the homeostasis of the intestinal microbiota, as a result, they delay the progression of AD.

**Conclusion:** According to the evidence, probiotics increase cognition in people with AD through factors such as reducing the levels of inflammatory and oxidative biomarkers. However, current evidence is insufficient and further studies are needed.

**Keywords:** Alzheimer; probiotics; mechanism; dementia.



## THE EFFECTS OF PROPOLIS SUPPLEMENTATION ON HIGH-SENSITIVITY C-REACTIVE PROTEIN, TESTOSTERONE HORMONE, AND METABOLIC PROFILE IN WOMEN WITH POLYCYSTIC OVARY SYNDROME: A RANDOMIZED, TRIPLE-BLIND, PLACEBO-CONTROLLED CLINICAL TRIAL

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**Background and Aim:** One of the most prevalent ovulation disorders is polycystic ovarian syndrome (PCOS). According to the anti-inflammatory and beneficial effects of propolis, this triple-blind controlled trial was designed to evaluate the effect of propolis on metabolic factors, high-sensitivity C-reactive protein, and testosterone in women with PCOS.

**Methods:** Recruited patients from the gynecologist clinic were randomized based on a stratified permuted four-block randomization procedure to supplement with propolis tablets, two tablets/day (500 mg propolis/day) (n=30) or identical placebo tablets (n=30) for 12 weeks in 2021 until 2022. Data were collected using a demographic questionnaire, blood samples, and a checklist to record the measured parameters. A total of 57 patients completed the trial.

**Results:** ANCOVA test showed that hip circumference (HC) (p=0.03), fasting insulin (p=0.007), homeostatic model assessment for insulin resistance (p=0.004), testosterone (p=0.004), and low-density lipoprotein (LDL)/high-density lipoprotein (HDL) (p=0.02) were significantly decreased in the propolis versus the placebo group after adjustment for confounders. Although fasting blood glucose (p=0.04) decreased significantly in the propolis group compared to the placebo, after adjusting for confounders, significance was lost (p=0.09).

**Conclusion:** Supplementation with propolis elicited positive effects on fasting insulin and insulin resistance, in addition to reducing the testosterone level, LDL/HDL, and HC, in PCOS women.

**Keywords:** Propolis; Polycystic ovarian syndrome; Metabolic parameters; Testoster-



one; Inflammation; Clinical trial

## FERMENTED AND NON-FERMENTED DAIRY PRODUCTS AND HYPERTENSION

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**Background and Aim:** Hypertension (HTN) is a major public health problem. Diet can have an important effect on HTN. Foods like dairy products containing angiotensin I-converting enzyme (ACE) inhibitory peptides which are assumed to be effective in prevention of HTN. The aim of this study was to investigate the relation between fermented and non-fermented dairy foods and HTN in a sample of premature coronary artery disease individuals.

**Methods:** This study was conducted on 1854 PCAD patients. A validated 110-item food frequency questionnaire was used to assessed dietary intakes. HTN was defined as having higher systolic or diastolic blood pressure of 140 mmHg or 90 mmHg respectively. Binary logistic regression was used to assess the odds of HTN across the quartiles of dairy products.

**Results:** Compared to the first quartile, those in the highest quartile of fermented dairy products had lower risk of HTN (OR= 0.70, 95% CI: 0.52, 0.96; P for trend= 0.058). However, after adjusting for confounders the significance disappeared. Compared to the bottom quartile those in the top quartile of high-fat fermented dairy products had 34% lower risk for HTN (95% CI: 0.49, 0.88; P for trend < 0.001). Adjustment for confounders weakened the relation but remained still significant (OR=0.73, 95% CI: 0.53, 1.01; P for trend= 0.001). There was no significant relation between low-fat fermented, low-fat non-fermented, and high-fat non-fermented dairy products and HTN.

**Conclusion:** In a population with low dairy intake, moderate intake of high-fat, fermented dairy products may be associated with a lower risk of HTN.

**Keywords:** Hypertension, Fermented Milk Products, Fermented Dairy Product, Dairy Product



## TOMATO'S PHYTOCHEMICALS AND PROSTATE CANCER: A SYSTEMIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Findings on the effect of tomato's phytochemicals on prostate cancer risk are conflicting. Several investigators have proposed that lycopene may be the component responsible for lowering the risk of prostate cancer. However, previous studies have reported controversial results on the association between lycopene consumption and prostate cancer risk. Hence, the current systemic review of randomized controlled trials (RCTs) was conducted to assess available findings on the effect of tomato phytochemicals on prostate cancer risk in adults.

**Methods:** In this study, the online databases of PubMed, Scopus, ISI Web of Science up to July, 2022, were systematically searched. No restriction was considered in the time of publication and articles languages. The Cochrane quality assessment tool was applied to assess the risk of bias for each study included in this systematic review.

**Results:** Overall, 5 articles were included (n=127 individuals, ages>18). Of the 5 studies, 4 articles showed that phytochemicals, especially lycopene, could reduce the risk of Prostate Cancer. However, 1 article did not report any significant effect. Based on the Cochrane tool, most studies included in the current systemic review had high quality.

**Conclusion:** In conclusion, we determined that consumption of enough lycopene appears to be reducing the risk of Prostate cancer. However, Duo to some articles that have suggested differently, to obtain the results of the study, further studies are needed.

**Keywords:** Diet; Lycopene; Prostate cancer; Tomato's phytochemicals



## THE ASSOCIATION BETWEEN HEALTH EATING INDEX (HEI) AND THE RISK OF BREAST CANCER

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**Background and Aim:** One of the most important modifiable risk factors in breast cancer is the quality of diet. the Healthy Eating Index (HEI) is one of the most frequently used measures of diet quality. Limited studies have investigated the effect of HEI on breast cancer. This review tries to provide acceptable evidence for the relationship between Health Eating Index and breast cancer.

**Methods:** This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. We performed a systematic literature search up to April 2023 in English in the PubMed, Web of Science, Embase, and Cochrane databases.

**Results:** It seems that a high-quality diet defined by HEI can have a protective role in the risk of breast cancer, on the other hand, breast tumors can be caused by infiltration of Th2 cells, chronic activation of humoral immunity and polarized inherent inflammatory cells. A higher intake of vegetables, fruits, dairy products, protein and unsaturated fatty acids, and whole grains indicates a higher score for HEI. Conversely, higher consumption of refined grains, sodium, added sugars, and saturated fat was associated with a lower HEI score.

**Conclusion:** Higher HEI score was associated with a reduced breast cancer risk. Further studies are warranted to confirm present findings.

**Keywords:** Health Eating Index, Breast Cancer, dietary pattern



## THE EFFECT OF NIGELLA SATIVA ON SERUM LEVELS OF INSULIN-LIKE GROWTH FACTOR AND ITS BINDING PROTEINS IN POSTMENOPAUSAL WOMEN WITH LOW BONE DENSITY: A TRIPLE-BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Animal studies have shown that *Nigella sativa* (NS) seed oil can increase Insulin-like growth factor (IGF-1) serum levels. This study aimed to investigate the effect of oral capsule NS on serum levels of IGF-1 and its binding proteins (IGFBP-1, IGFBP-3) in postmenopausal women with bone loss density.

**Methods:** Sixty postmenopausal women of 50 to 65 years with bone loss density randomly received a soft capsule of NS oil 1000 mg or placebo once daily for six months with a 1:1 allocation ratio. DEXA method was used to measure bone density. Serum concentrations of IGF-1, IGFBP-1 and-3, ALT, AST, ALP, Cr, and urea were measured at baseline and after the intervention.

**Results:** There were no significant differences in serum levels of IGF-1, IGFBP-1, urea, Cr, ALT, AST, and ALP between the two groups at the end of six months. However, a significant increase has been shown in IGFBP-3 between groups after the intervention (Adjusted mean difference: 95% CI: 1.65: 0.36 to 2.97;  $p=0.013$ ).

**Conclusion:** We observed a significant increase in IGFBP-3 serum levels without any side effects. Additional research with an increased number of participants may be needed for further clarification of its beneficial anabolic effects on the GH system.

**Keywords:** IGF-1, IGFBPs, Menopause, *Nigella sativa*, Osteopenia, Osteoporosis



## THE EFFECT OF SELECTED HERBAL MEDICINES ON BONE TURNOVER MARKERS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** To evaluate systematically the therapeutic effects of five herbal medicines (curcumin, black seed, ginger, cinnamon, and flaxseed oil) on bone turnover markers as a primary outcome.

**Methods:** A comprehensive systematic search of the literature was conducted in the electronic databases. All Randomized controlled trials and quasi-experiments evaluated the impact of studied herbal medicines on bone turnovers of Bone Specific Alkaline Phosphatase (BSAP), osteocalcin, C-terminal Telopeptide type 1 Collagen (CTX-I), Deoxypyridinoline (DPD) were analyzed.

**Results:** Sixteen interventional studies comprised 968 participants included in systematic review. Ten of eligible studies with 603 participants included in meta-analysis. Curcumin, black seed and flaxseed did not have a significant effect on BSAP (SMD=-1.76, 95%CI: -6.85 to 3.33, p=0.50, I<sup>2</sup>=0.99, 6 trials, 241 participants), CTx (SMD=-0.17ng/mL, 95%CI:-0.43 to 0.09, p=0.21, I<sup>2</sup>=1.000, 5 trials, 216 participants), DPD (MD=0.82nmol/mmol, 95%CI:-0.05 to 1.68, p=0.06, I<sup>2</sup>=0.000, 2 trials, 67 participants), osteocalcin (SMD=-2.02ng/mL, 95%CI:-4.49 to 0.45, p=0.11, I<sup>2</sup>=0.79, Six trials, 229 participants). As secondary outcomes, femoral neck Bone Mineral Density (BMD) increased significantly (p=0.03, I<sup>2</sup>=0.12) but lumbar spine BMD didn't differ (p=0.28, I<sup>2</sup>=0.97). Curcumin significantly increased total hip BMD (p<0.001, I<sup>2</sup>=0.12). QiangGuYin containing cinnamon as a combined Chinese medicine had significant effect on P1NP,  $\beta$ -CTx, and BMD.

**Conclusion:** Studied herbs except for QiangGuYin had no significant effects on bone turnover markers. Due to high heterogeneity between trials, further high-quality trials are suggested.

**Keywords:** Medicinal Plants; Bone Remodeling; Bone Density; Meta-Analysis; Systematic Review





## PROBIOTICS SUPPLEMENTATION IMPROVES QUALITY OF LIFE, CLINICAL SYMPTOMS, AND INFLAMMATORY STATUS IN PATIENTS WITH PSORIASIS

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**Background and Aim:** Studies have proposed a link between psoriasis and imbalanced gut microbiome. Therefore, the modulation of the gut microbiota with probiotics may improve clinical outcomes, chronic inflammation, and cardiovascular risk factors in patients with psoriasis.

**Methods:** In a randomized double-blind placebo-controlled clinical trial, forty-six patients with psoriasis randomly assigned into probiotic capsules contains multi-strain at least  $1.6 \times 10^9$  CFU/g bacteria or placebo for two months. Psoriasis Area and Severity Index (PASI), blood pressure, quality of life (QOL) pro-inflammatory cytokines (hs-CRP and IL1- $\beta$ ), and lipopolysaccharides (LPS) were measured.

**Results:** Improvements in QOL was significant in patients taking probiotics supplementation comparing to the placebo group and PASI ( $-5.06 \pm 2.10$  vs  $0.30 \pm 1.80$ ,  $P=0.049$ ) as well. After the intervention, a considerable reduction in serum LPS levels ( $-7.21 \pm 10.33$  vs  $-2.74 \pm 0.97$  mmol/L,  $P=0.010$ ), hs-CRP levels ( $-1.67 \pm 0.95$  vs  $-0.70 \pm 0.38$  mg/L,  $P=0.013$ ), and IL1- $\beta$  levels ( $-1.64 \pm 1.10$  vs  $0.17 \pm 0.20$  mg/L,  $P=0.043$ ) in the probiotics group.

**Conclusion:** This study shows that probiotics significantly improved the quality of life and seriousness in psoriatic patients. Moreover, it enhances cardiovascular risk factors and inflammatory/oxidative stress markers.

**Keywords:** Probiotics, Quality of Life, Psoriasis



## THE RELATIONSHIP BETWEEN THE CARBONATED DRINK AND DEPRESSION

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**Background and Aim:** Depression is a widespread mental health disorder that makes people feel sad persistently. The link between carbonate drink and depression is an intriguing topic that explores how diet may influence mental health, but there is not much research on this specific connection. The study aims to investigate the relationship between carbonated drink intake and depression

**Methods:** This cross-sectional study involved 604 Iranian adults aged 18-65 from different regions. We used the Depression Anxiety Stress Scales 21 (DASS21), a validated self-reported questionnaire, to measure depression. We assessed carbonated drink intake using the Food Frequency Questionnaire (FFQ). We used logistic regression analysis to examine the link between carbonated beverage intake and depression in both unadjusted and adjusted models.

**Results:** Carbonated drink intake was not significantly associated with depression in the crude model (OR: 0.827; 95% CI: 0.499-1.369; P: 0.460). This association remained non-significant after adjusting for age, gender, smoking, Body mass index (BMI), and energy intake (OR: 0.739; 95% CI: 0.428-1.227; P: 0.278).

**Conclusion:** Given the limited findings of this study and the scarcity of research in this area, more studies are needed to explore the potential relationship between carbonated drink intake and depression.

**Keywords:** Carbonated drink, Depression, Adults, Cross sectional



## THE RELATIONSHIP BETWEEN COFFEE INTAKE AND COLORECTAL CANCER (A SYSTEMATIC REVIEW)

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**Background and Aim:** Colorectal cancer is the third and second most common cancer in weightlifters, respectively, the cause of death from the world, with a global prevalence of about 153,000 people. This cancer is affected by environmental and genetic factors. Family history, insulin resistance, history of inflammatory bowel diseases, and the history of bowel polyps are risk factor. Coffee contains cancers such as polyphenols, dirapens, melanoids and antioxidants, which may be due to CRC survival through systemic disruptions caused by metabolic programming of cancer or by promoting anti -cancer and anti -cancer developmental progress.

**Methods:** This systematic review study was conducted by searching the databases of Scopus, Pubmed, Google Scholar. The keywords "Coffee" "Colorectal Cancer" were used to search the keywords..After screening,58 studies were included in our study.

**Results:** Studies have shown that prolonged coffee consumption improves inflammation and insulin sensitivity and more coffee consumption is associated with lower levels of peptide C and inflammatory biomarkers (CRP, IL-18). The purpose of mitogen -activated kinase protein and mitogen protein inhibits the metastasis of colon cancer by disrupting the transcription of metastatic metastatic metastatic Peruvian genes (such as MMP and VEGF). The intestine, such as E.coli and Kandida Albiches, improves the effect of antimicrobials.

**Conclusion:** Caffeine as antioxidant protects the cells against oxidative stress and as a regulator of the cell cycle of the DNA repair system and the interaction with the recipients of the heocitukines, the immune system

**Keywords:** Caffeine, Coffee, colorectal cancer



## EFFECTS OF CINNAMON, CARDAMOM, SAFFRON, AND GINGER CONSUMPTION ON MARKERS OF GLYCEMIC CONTROL, LIPID PROFILE, OXIDATIVE STRESS, AND INFLAMMATION IN TYPE 2 DIABETES PATIENTS

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**Background and Aim:** Type 2 diabetes (T2D) may be caused by elevated oxidative stress, inflammation, and hyperglycemia. The phytochemicals in several herbal medicines are reported to effectively improve diabetes and to ameliorate diabetic complications. The aim of the present study was to determine the effects of cinnamon, cardamom, saffron, and ginger as supplementary remedies in T2D.

**Methods:** This randomized controlled, clinical trial included 204 T2D patients. The participants were randomly assigned to four intervention groups receiving 3 glasses of black tea and either 3 g cardamom, or cinnamon, or ginger, or 1 g saffron and one control group which consumed only 3 tea glasses without any herbal medicine for 8 weeks. Markers of inflammation, oxidative stress, fasting blood sugar, lipid profile, and anthropometric measures were evaluated at baseline and after 8 weeks of intervention

**Results:** After 8 weeks of intervention, cinnamon, cardamom, ginger, and saffron consumption had significant effects on total cholesterol, LDL, and HDL levels ( $p < 0.05$ ) compared with controls. However, the herbal products did not have significant effects on measures of glycemic control, anthropometry, inflammation, and oxidative stress. In within-group comparisons only, cinnamon intake significantly decreased fasting blood sugar (FBS).

**Conclusion:** The herbal remedies examined had significantly beneficial effects on cholesterol, but not on measures of glycemic control, oxidative stress, and inflammation. Based on the contradictory results reported in the literature, the effects of herbal medicine in diabetic patients should undergo further detailed investigation.

**Keywords:** type 2 diabetes, herbal medicine, glycemic control, oxidative stress, inflammation



## EFFECT OF CINNAMON, CARDAMOM, SAFFRON AND GINGER CONSUMPTION ON BLOOD PRESSURE AND A MARKER OF ENDOTHELIAL FUNCTION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A RANDOMIZED CONTROLLED CLINICAL TRIAL

Paria Azimi

Effect of cinnamon, cardamom, saffron and ginger consumption on blood pressure and a marker of endothelial function in patients with type 2 diabetes mellitus: A randomized controlled clinical trial

**Background and Aim:** Herbal medicines with high amounts of phytochemicals have been shown to have beneficial effects on blood pressure (BP), endothelial function and anthropometric measures. This study aimed to determine the effect of herbal treatment on BP, endothelial function and anthropometric measures in patients with type 2 diabetes mellitus (T2DM).

**Methods:** This clinical trial included 204 T2DM patients randomly assigned to four intervention groups receiving 3 g cinnamon, 3 g cardamom, 1 g saffron or 3 g ginger with three glasses of black tea, and one control group consuming only three glasses of tea without any herbals, for 8 weeks. Intercellular adhesion molecule-1 (ICAM-1), systolic and diastolic BP and anthropometric measures were collected at baseline and after 8 weeks.

**Results:** No significant difference was found between various medicinal plants in terms of influencing BP, serum soluble (s)ICAM-1 concentrations and anthropometric measures. However, in within-group comparison saffron and ginger intakes significantly reduced sICAM-1 concentrations ( $340.9 \pm 14.4$  vs  $339.69 \pm 14.4$  ng/ml,  $p=0.01$ , and  $391.78 \pm 16.0$  vs  $390.97 \pm 15.8$  ng/ml,  $p=0.009$ , respectively) and ginger intake affected systolic BP ( $143.06 \pm 0.2$  vs  $142.07 \pm 0.2$  mmHg,  $p=0.02$ ).

**Conclusion:** Although administration of these herbal medicines as supplementary remedies could affect BP and sICAM-1 concentrations, there was no significant difference between the plants in terms of influencing anthropometric measures, BP and endothelial function.

**Keywords:** Blood pressure, diabetes mellitus type 2, endothelial function, herbal



## THE EFFECT OF POMEGRANATE INTAKE ON PSA LEVELS IN PATIENTS WITH PROSTATE CANCER

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**Background and Aim:** Prostate Cancer is currently a leading cause of death among men worldwide. This review study aims to investigate the effects of pomegranate intake on PSA levels in patients with prostate cancer.

**Methods:** This is a review study that searched for the keywords pomegranate, PSA, and prostate cancer in various databases and search engines including PubMed, Medline, Web of Science, Magiran, and Google Scholar. The articles were screened by title, abstract, and full text.

**Results:** Contradictory findings exist in the literature regarding the impact of pomegranate consumption on PSA levels in prostate cancer patients. According to some sources, consuming 250 mL of pomegranate juice daily on a continuous and regular basis can increase PSA levels and decrease the risk of prostate cancer. Other studies indicate that pomegranate juice consumption has no effect on PSA levels or the prevention of prostate cancer.

**Conclusion:** Some sources suggest that regular consumption of pomegranate can increase the duration of PSA, an indicator of prostate cancer. However, other sources indicate that daily consumption of pomegranate has no effect on PSA levels in patients with advanced prostate cancer. The conflicting results regarding the effect of pomegranate juice on PSA levels may be due to the size of the cancer in patients with prostate cancer. Based on the reviewed studies, it is not possible to draw a definitive conclusion regarding the effect of pomegranate juice on PSA levels in patients with prostate cancer.

**Keywords:** Pomegranate, PSA, Prostate Cancer



## ASSOCIATION BETWEEN CARBOHYDRATES AND INFLAMMATION

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**Background and Aim:** Inflammation plays a significant role in the development of chronic diseases such as cardiovascular disease, cancer, diabetes, and neurodegenerative diseases. As an important part of the diet, carbohydrates can play an important role in suppressing or increasing the level of inflammation and its symptoms. The aim of this study was to evaluate the association of dietary carbohydrates and severity of inflammation

**Methods:** PubMed, Google Scholar, Web of Science databases were searched for studies in the time frames of 2018 to 2023, evaluating the association between carbohydrates and inflammation. Finally, 7 studies were analyzed

**Results:** Our studies were conducted in two ways: 1- simple carbohydrates in diet and their effects on inflammation 2- effects of complex carbohydrates on inflammation. Examining the level of inflammatory cytokines in subjects who consumed high-carbohydrate diets with simple sugars showed an increase in IL6 and CRP levels. Also, in separate studies, it was found that fructose causes a stronger cytokine response than other simple sugars. In studies with simple carbohydrate reduction, it has been seen that the amount of inflammatory cytokines and adiponectin has decreased. Also, the measurement of adiponectin showed a decrease until the end of the 20th week. Triglycerides and blood glucose level, which are long-term inflammatory markers, also decreased. Reviewing diets containing complex carbohydrates, showed a decrease in inflammatory cytokines in long-term studies, which indicated the anti-inflammatory effects of Mediterranean diet

**Conclusion:** simple carbohydrates cause inflammation by increasing inflammatory markers in tissues. However, consuming complex carbohydrates containing fiber can reduce the symptoms of inflammation

**Keywords:** Inflammation, Simple and Complex Carbohydrates, Cytokines, Chronic Disease



## THE IMPACT OF DIETARY PHYTOCHEMICALS ON COLORECTAL CANCER

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**Background and Aim:** Colorectal cancer is a disease characterized by the abnormal growth of cells with the potential to invade and metastasize to other parts of the body, as well as changes in genes that regulate the body's natural functions. Nutritional factors play a crucial role in preventing cancer, among which phytochemicals have significant potential and the ability to suppress tumors in various forms

**Methods:** A search was conducted in the Pubmed and Google Scholar databases using the keywords (Phytochemicals, colon cancer, capsaicin, carotenoids) within the time range of 2020 to 2023. Ultimately, 13 studies were examined in detail

**Results:** Human and animal experiments have shown that these plant extracts inhibit the growth of colorectal tumors by inducing apoptosis or autophagy, arresting the cell cycle at different stages, and activating multiple signaling pathways. Some of them also have anti-inflammatory effects, reduce oxidative stress, and, in addition to other anti-cancer mechanisms, prevent or delay oxidation by eliminating free radicals. The effects of capsaicin in chili pepper, curcubitacin B, carotenoids (which cause red color in fruits), polyphenol clusters in green tea, and flavonoids were examined in this study

**Conclusion:** As demonstrated by various studies, a diet rich in fruits and vegetables (the main sources of phytochemicals) can contribute to reducing the incidence of cancer, and they should be included in our dietary habits. Understanding the compounds and nutritional components that can prevent, reduce, or control cellular damage is crucial for promoting healthy eating behaviors

**Keywords:** Phytochemicals, Colorectal Neoplasms, Capsaicin, Carotenoids





## THE POTENTIAL ROLE OF FUNCTIONAL FOODS IN REDUCING THE RISK OF CARDIOVASCULAR DISEASE

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**Background and Aim:** Cardiovascular disease (CVD) remains a leading cause of mortality globally. Dietary factors are crucial in its prevention. Functional foods, enriched with physiologically active nutrients such as omega-3 fatty acids, plant sterols, antioxidants, and probiotics, have gained attention for their potential to mitigate CVD risk. This study aimed to present a compelling overview of the existing research on functional foods and their potential in reducing the risk of CVD

**Methods:** A comprehensive review was conducted using databases including Google Scholar and PubMed, spanning from 2004 to 2023. A meticulous selection process led to the inclusion of seventeen pertinent articles for analysis

**Results:** The findings highlight the following mechanisms through which functional foods can potentially alleviate CVD risk: **Reduced cholesterol:** Certain bioactive compounds such as omega-3 fatty acids, plant sterols, and soluble fiber have demonstrated the ability to diminish cholesterol absorption in the gut. For example, incorporating 1.6 grams of plant sterol esters fortified in daily consumables like milk, yogurt, breakfast cereals, and bread over a 12-week period can lower cholesterol absorption by 6.5% and 5.6% for bread and yogurt, respectively. **Reduced inflammation:** The presence of antioxidants and specific plant compounds within functional foods has been associated with a reduction in inflammation. **Reduced blood pressure:** Certain functional foods rich in potassium and magnesium have been linked to a lowering of blood pressure.

**Conclusion:** Functional foods exhibit promising potential in mitigating the risk of CVD. Nonetheless, further long-term investigations are imperative to assess the impact of sustained consumption of these foods on cardiac health and vasculature

**Keywords:** Functional foods, cardiovascular disease, bioactive compounds



## DOES COCOA REGULATE BLOOD LIPIDS IN TYPE 2 DIABETES? SYSTEMATIC REVIEW AND META-ANALYSIS OF CONTROLLED TRIALS

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**Background and Aim:** Dyslipidemia, a potential risk factor for cardiovascular disease, is prevalently observed in type 2 diabetes. Cocoa may exert positive impacts on blood lipids. This study aimed to examine the available data to conclude if cocoa modifies blood lipids in diabetes type 2.

**Methods:** PubMed, Scopus, and Embase databases and reference lists of relevant articles were systematically searched between January 1965 and June 2022 for relevant documents. Required data was extracted by two reviewers and risk of bias (RoB) was assessed using Cochrane tool. Random effect model was applied to compute standardized mean differences (SMDs). The results were graded based on the certainty of evidence.

**Results:** Ten papers met inclusion criteria. A significant decrease was observed in serum triglycerides (-0.57, 95% CI: -1.05, -0.10, I<sup>2</sup>: 82.7%), however, reductions in total cholesterol (-0.26, 95% CI: -0.72, 0.20, I<sup>2</sup>: 82.6%) and low-density lipoprotein cholesterol were not considerable (-0.44, 95% CI: -0.91, 0.03, I<sup>2</sup>: 63.0%). Also, serum high-density lipoprotein cholesterol was increased in a non-significant manner (0.16, 95% CI: -0.14, 0.47, I<sup>2</sup>: 82.6%). Severe to highly severe heterogeneity in findings could be related to age of participants, designation, study period, intervention discrepancy, body mass index, initial blood lipids, and possibility of bias.

**Conclusion:** Improvement in blood triglycerides following cocoa intake is of clinical importance. Further well-designed trials are required to provide certain evidence regarding other serum lipoproteins.

**Keywords:** cocoa; chocolate; diabetes mellitus; lipids; systematic review



## A DOUBLE BLIND RANDOMIZED CLINICAL TRIAL ON THE ANTI-OBESITY EFFECTS OF MYO-INOSITOL SUPPLEMENTATION IN PATIENTS WITH NAFLD

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**Background and Aim:** As Myo-inositol (MI)- a 6-C sugar alcohol derivative- leads to significant reduction in BMI through an amelioration of metabolic and hormonal parameters, this study aimed to investigate the effects of MI on body composition, adiponectin levels and the correlation between them in obese patients with non- alcoholic fatty liver diseases (NAFLD).

**Methods:** This placebo-controlled randomized clinical trial was carried out on 40 obese patients with NAFLD confirmed by ultrasonography findings. The patients were randomly allocated into either "MI group" (two 2g sachet of MI powder) or "Placebo group" (two 2g sachet of maltodextrin powder) plus dietary recommendation for eight weeks. Weight, height, body mass index (BMI), fat mass (FM), fat free mass (FFM) and serum levels of adiponectin were assessed at baseline and after the trial.

**Results:** Results showed a significant increase in serum level of adiponectin and improvements in FM and FFM. Indeed, Significant correlations were observed between serum adiponectin changes with the changes of FM, FFM (%) and BMI in the placebo group, while, only the correlation between changes in serum adiponectin and FFM (kg) was significant in MI group.

**Conclusion:** MI could be considered as a useful anti-obesity supplement for patients with NAFLD, while future research is needed.

**Keywords:** Non-alcoholic fatty liver disease, Myo-inositol, adiponectin, body composition



## DIETARY ADVANCED GLYCATION END-PRODUCTS AND THE RISK OF CANCERS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** The present meta-analysis aimed to assess the relationship between the dietary advanced glycation end-products (dAGEs) and their components with cancer risk.

**Methods:** PubMed, Scopus and Web of Science were searched for observational studies on dAGEs and cancer risk that were published up to August 2023. The reported hazard ratio (HR) with 95% confidence interval (CI) for cohort studies and odds ratio (OR) (95% CI) for a case-control study were converted into log HR and log OR, and their standard deviation was calculated. Then, to compute the pooled HR, the random-effects model with the inverse variance weighting method was performed.

**Results:** Forty-three observational studies were included in the present meta-analysis. The sample size ranged from 401 to 450111, with an age range of 47.9 to 67.2 years. During the follow-up period (ranging from 3.1 to 14.9 years), 72026 cancer incidences occurred. The pooled results showed no significant association between dAGEs intake and cancer risk (RR = 1.00; 95% CI: 0.95–1.05, I<sup>2</sup> = 61.2%; P-heterogeneity = 0.001). Also, a subgroup analysis based on dAGEs components revealed there is no significant relationship between N-carboxy-methyllysine (RR = 1.07; 95%CI: 0.96–1.20, I<sup>2</sup> = 68.6%; P-heterogeneity < 0.001), N-carboxyethyllysine (RR = 0.99; 95%CI: 0.89–1.11, I<sup>2</sup> = 59.3%; P-heterogeneity = 0.043), and methylglyoxal-derived hydroimidazolones (RR = 0.97; 95%CI: 0.90–1.05, I<sup>2</sup> = 68.6%; P-heterogeneity = 0.007) and cancer risk.

**Conclusion:** The pooled results suggested that there is no significant association between dAGEs intake and its components with the risk of cancer.

**Keywords:** Dietary advanced glycation end-products; dAGEs; Cancer; Meta-analysis



## VITAMIN K2 (MENAQUINONE-7) DECREASES LEPTIN BUT DOES NOT AFFECT ADIPONECTIN LEVELS IN OVERWEIGHT/OBESE TYPE 2 DIABETES PATIENTS: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** Type 2 Diabetes mellitus (T2DM) is a prevalent disease worldwide with an increasing trend in recent years which could lead to various metabolic consequences. Previous studies reported lower levels of adiponectin and higher levels of leptin in T2DM patients. Vitamin K has shown beneficial effects in reducing T2DM risk in some previous studies. Therefore current study aimed to assess the effect of vitamin K supplementation as menaquinone-7 (MK-7) on adiponectin and leptin in overweight/obese T2DM patients.

**Methods:** In this double-blind placebo-controlled randomized clinical trial, 60 men and women with T2DM and  $27 \leq$  body mass index  $< 35$  kg/m<sup>2</sup> were enrolled and randomly allocated into intervention (200µg/day MK-7) or placebo groups. Three-day food records, anthropometrics, and physical activity were evaluated, and fasting blood samples were collected at the pre- and post-intervention. Serum adiponectin, leptin, fasting blood sugar (FBS), and fasting insulin (FI) were measured and adiponectin to leptin ratio (A/L ratio) was calculated.

**Results:** After 12 weeks of intervention, the remaining 45 patients were included in the analysis. Within-group analysis showed a decreasing effect of MK-7 in FBS (P: 0.018) and FI (P: 0.012). FBS and leptin levels were lower in the MK-7 group (P: 0.024 and P: 0.032, respectively), but there were no significant changes between the groups in terms of adiponectin or A/L ratio.

**Conclusion:** The current study represented that MK-7 supplementation could lead to a significant reduction in leptin and FBS in overweight/obese T2DM patients, but no significant effects on the adiponectin and A/L ratio were found.

**Keywords:** adiponectin; diabetes; leptin; menaquinone-7; overweight; obesity



## THE ASSOCIATION OF DIETARY VITAMIN K INTAKE WITH GLYCEMIC INDEX, LIPID PROFILE AND BODY COMPOSITION IN OVERWEIGHT/OBESE TYPE 2 DIABETES PATIENTS

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**Background and Aim:** Type 2 diabetes mellitus (T2DM) is a global metabolic disease with micro- and macro-vascular complications which is characterized by constant hyperglycemia and leads to costly effects. Dietary intake management is a convenient and economical strategy to control the disease and its complications. Previous studies showed the beneficial effects of vitamin K in diabetes. So our study aimed to assess the association of vitamin K dietary intake with glycemic indices, lipid profile, and body composition in overweight/obese T2DM patients.

**Methods:** Forty-five men and women with T2DM and a body mass index between 27 and 35 kg/m<sup>2</sup> participated in the current study. Dietary intake of vitamin K and body composition were assessed using three-day food records and bioelectrical impedance analysis respectively and fasting blood samples were collected. Three-day food records were collected twice with 3-month intervals.

**Results:** There were no significant associations between dietary intake of vitamin K with glycemic indices and body composition using linear regression analysis ( $P > 0.05$ ). Also, none of the lipid indices showed a significant relationship with dietary vitamin K intake except for high-density lipoprotein (HDL) which revealed a significant positive association with it ( $P: 0.005$ ,  $\beta: 0.409$ ).

**Conclusion:** The study showed that dietary intake of vitamin K could be related to HDL levels in overweight/obese T2DM patients, but it did not show any significant associations with other lipid markers, glycemic factors, and body composition.

**Keywords:** diabetes; overweight; obesity; vitamin K; glycemic indices; lipid profile; body composition



## THE EFFECT OF CONJUGATED LINOLEIC ACID ON SERUM LEVEL OF RESISTIN IN NON-ALCOHOLIC FATTY LIVER DISEASE

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**Background and Aim:** The alarming increase of non-alcoholic fatty liver disease in the world has created a field for more research to treat this disease and reduce its complications. In this regard, in the present study, the effect of conjugated linoleic acid, which is a type of functional supplement and is related to weight loss and improvement of related indicators, on serum resistin in obese patients with non-alcoholic fatty liver has been investigated.

**Methods:** This double-blind randomized clinical trial study was conducted in 2 sub-groups with 54 healthy obese persons and those with non-alcoholic fatty liver disease in 8 weeks. Both groups consumed 400 IU of vitamin E during the study. in addition, the control group consumed 3 soft gels of 1000 mg of CLA daily

**Results:** Resistin of serum in group CLA decreased significantly during the study, but this decrease was not significant compared to the control group.

**Conclusion:** According to a finding of the present study, supplementing with CLA did not have a significant effect on the amount of serum resistin in patients with non-alcoholic fatty liver disease. Considering the relationship between obesity and body fat mass with Fat accumulation in the liver, and the high level of serum resistin in these people, it is suggested to conduct more studies with a larger number of people and a longer period to investigate the effect of CLA supplementation.

**Keywords:** NAFLD, CLA, Resistin



## ASSOCIATION OF DIETARY CALCIUM INTAKE AND OBESITY AMONG ELDERLY POPULATION: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Obesity is a serious health challenge worldwide and is associated with various comorbidities, including dyslipidemia, type 2 diabetes, and cardiovascular disease. Developing effective strategies to prevent obesity is therefore of paramount importance.

**Methods:** This cross-sectional study was conducted on 345 participants aged 60 years or older. A valid semi-quantitative food frequency questionnaire (FFQ) was used to assess the usual dietary intakes of participant's. We used multivariable binary logistic regression analyses to evaluate the association between dietary calcium intake and odds of general obesity.

**Results:** The prevalence of obesity among study participants was 30.6%. The association of dietary calcium intake with obesity was non-significant (ORs for comparing T3 vs. T1: 0.79; 95% CI: 0.43, 1.46) after adjusting for potential confounders.

**Conclusion:** We didn't find any significant associations between dietary calcium intake and obesity in elderly population.

**Keywords:** obesity; dietary calcium; elderly.





## THE IMPACT OF NUTRITION ON VECTOR-BORNE DISEASES: IMPLICATIONS FOR GLOBAL HEALTH

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**Background and Aim:** This review examines the relationship between nutrition and susceptibility to vector-borne diseases such as malaria and dengue fever, which cause approximately 700,000 deaths annually and affect nearly half the world's population.

**Methods:** The study conducted a comprehensive search of databases to identify relevant literature on the impact of nutrition on the incidence and severity of these diseases.

**Results:** The findings highlight the link between childhood obesity and negative outcomes from dengue fever, as well as the association of specific nutrient biomarkers with disease severity. Additionally, there is evidence of a seasonal pattern of malaria incidence and nutritional program admissions, with treated malaria infection leading to increased weight gain and decreased linear growth. The review also emphasizes the potential public health and clinical implications of addressing nutritional factors in the context of vector-borne diseases. The Mediterranean diet, known for its beneficial fatty acids, may offer potential benefits in managing malaria. Furthermore, malnutrition, particularly among children and pregnant women, presents a significant public health challenge in impoverished populations. Deficiencies in essential nutrients such as iron, zinc, and vitamin A have been shown to increase susceptibility to malaria. Malnutrition has also been observed to affect the susceptibility and severity of leishmaniasis infections.

**Conclusion:** The review underscores the need for continued exploration of the relationship between nutrition and vector-borne diseases to inform effective public health interventions and clinical management strategies. Overall, the findings advocate for integrated approaches to address both nutritional status and disease outcomes in the prevention and management of vector-borne diseases.

**Keywords:** Vector-borne diseases, Nutrition, Malnutrition



## THE ASSOCIATION BETWEEN DIETARY PATTERNS AND DISEASE SEVERITY IN PATIENTS WITH ULCERATIVE COLITIS

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**Background and Aim:** Ulcerative colitis (UC) is a chronic inflammatory disease involving the colon and rectum. One of the most modifiable environmental factor affecting UC severity is the patient's dietary pattern. Although the role of dietary patterns on UC etiology have been investigated previously, its relationship with disease severity has not yet been elucidated. This study examined the association between UC patients' dietary patterns and disease severity.

**Methods:** This cross-sectional study was conducted on 340 UC patients. Using a FFQ, food patterns were assessed. Twenty-five food categories were categorized based on the similarity of the nutrient composition of the food using the factor analysis method. A simple clinical colitis activity index was used to determine disease severity.

**Results:** Three dietary patterns were identified based on the factor analysis: healthy, unhealthy, and Western dietary pattern. After adjusting for potential confounding factors, patients who were in the highest tertile of healthy dietary pattern compared to the lowest tertile were 92% less likely to have severe UC (odds ratio [OR]: 0.08; 95% CI: 0.03, 0.22). Also, those in the highest tertile of the Western dietary pattern were 3.86 times more likely to have severe UC than those in the lowest tertile (OR: 3.86; 95% CI: 1.86, 8.00). Even after controlling for confounding variables, unhealthy dietary pattern did not increase the risk of severe UC.

**Conclusion:** Our data indicate the beneficial role of healthy dietary pattern in amelioration of disease severity in UC patients. To confirm this association, more studies are needed, especially prospective cohort studies.

**Keywords:** dietary patterns; disease severity; ulcerative colitis; principal component analysis



## WHAT IS THE INFLUENCE OF POLICOSANOL SUPPLEMENTATION ON LIVER ENZYMES? A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Policosanol is a mixture of long chain alcohols refined from sugar cane. Significant reductions in liver enzymes have been observed in some studies. However, the impact of policosanol on liver enzymes remained controversial. The current meta-analysis aims to evaluate the effect of policosanol supplementation on the levels of alanine transaminase (ALT) and aspartate transaminase (AST).

**Methods:** The literature was systematically searched for studies published up to November 2023 in PubMed/Medline, Google Scholar, EMBASE, and Scopus. Randomized controlled trial (RCT) studies were included to evaluate the intervention effect of policosanol compared to placebo on ALT and AST. DerSimonian and Laird models were used to calculate effect sizes.

**Results:** Twenty-three trials including 2535 participants were included in the study. The combination of effect sizes, regarding the random-effects model, demonstrated significant changes in ALT serum levels after intervention (WMD: -1.48 U/L; 95% CI: -2.33 to -0.64; P = 0.001), and AST (WMD: -1.10 U/L; 95% CI: -1.70 to -0.51; P<0.001). Subgroup analysis of AST and ALT showed that this reduction effect was most often observed at the dose of 20 mg/d. The dose-response analysis represented a non-significant non-linear connection between the dosage and duration of policosanol intervention in ALT and AST serum reduction.

**Conclusion:** Policosanol supplementation exerts a beneficial effect on liver enzymes as well as ALT and AST concentrations in adults. However, further long-term and well-designed RCTs with better quality are needed to further assess and confirm these results.

**Keywords:** Alanine aminotransferase; Aspartate transaminase; Liver function; Meta-analysis.



## THE EFFECT OF RAISIN INTAKE ON BLOOD PRESSURE: SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

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**Background and Aim:** Raisins are a relatively healthy snack, particularly when compared to snacks with a high glycemic index, and can have beneficial effects on human health against chronic disorders.

**Methods:** We comprehensively searched electronic databases, including PubMed, Scopus, Google Scholar, ISI Web of Science, and Embase, from inception to February 2021. Overall, 7 randomised clinical trials were included in the present study.

**Results:** There was a significant effect between raisin consumption and SBP (WMD: -3.45 mmHg, 95% CI: -6.30, -0.59,  $P = 0.01$ ), but no significant effect was found between raisin consumption with DBP (WMD: -0.51 mmHg, 95% CI: -2.67, 1.65,  $P = 0.64$ ).

**Conclusion:** It appears that raisins could be advocated as an SBP-reducing snack in the management of hypertension in adults.

**Keywords:** Raisin; Blood pressure; Meta-analysis; Systematic review



## CONSUMPTION OF DAIRY PRODUCTS AND ODDS OF ULCERATIVE COLITIS: AN IRANIAN CASE-CONTROL STUDY

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**Background and Aim:** The association between dairy products consumption and the risk of ulcerative colitis (UC) is not well elucidated. This case-control study examined the association between Iranian adults' dairy consumption and UC risk.

**Methods:** We used a valid food frequency questionnaire to analyze dietary intakes in 340 patients with pathologically confirmed cases of UC and 782 controls as part of a case-control research. Pasteurized milk, cheese, and yogurt dietary intakes were calculated along with dairy products. Other variables were acquired using questionnaires.

**Results:** Study participants' mean ( $\pm$  SD) age and body mass index were  $41.5 \pm 14.1$  years and  $27.4 \pm 4.77$  kg/m<sup>2</sup>, respectively. After adjusting for potential variables, individuals who consumed more total dairy products were less likely to get UC than those who consumed less (odds ratio [OR]: 0.41; 95% confidence interval [CI]: 0.19, 0.89). We found a significant reverse association between milk intake (OR: 0.11; 95% CI: 0.04–0.24) and yogurt intake (OR: 0.58; 95% CI: 0.29–1.13) and UC, after controlling for potential confounders. Also, no significant association was found between cheese and UC risk (OR: 1.34; 95% CI: 0.69–2.57).

**Conclusion:** Higher consumption of total dairy products may reduce UC risk. To be specific, milk and yogurt are inversely associated with this disorder. However, no link was found between cheese intake and UC. Longitudinal observational studies, especially cohorts, are needed to further assess these associations.

**Keywords:** Ulcerative colitis; Dairy products; Milk; Case-control;



## THE EFFECTS OF ASTAXANTHIN SUPPLEMENTATION ON LIVER ENZYMES LEVELS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** According to previous studies, astaxanthin exerts various of biological effects due to its anti-inflammatory and antioxidant capabilities; however, its effects on liver enzymes have not yet been well elucidated. Therefore, we conducted a meta-analysis to assess astaxanthin's effects on liver enzymes.

**Methods:** A systematic literature search was conducted using scientific databases including PubMed, Scopus, Web of Science, the Cochrane databases, and Google Scholar up to February 2023 to find relevant randomized controlled trials (RCTs) examining the effects of astaxanthin supplementation on alanine transaminase (ALT), aspartate transaminase (AST), gamma-glutamyl transferase (GGT), and alkaline phosphatase (ALP). A random-effects model was used for the estimation of the pooled weighted mean difference (WMD).

**Results:** Overall, we included five trials involving 196 subjects. The duration of the intervention was between 4 and 48 weeks, and the dose was between 6 and 12 mg/day. ALT levels increased in the intervention group compared to the control group following astaxanthin supplementation (WMD: 1.92 U/L, 95% CI: 0.16 to 3.68, P=0.03), whereas supplementation with astaxanthin had a non-significant effect on AST (WMD: 0.72 U/L, 95% CI: - 0.85 to 2.29, P=0.36), GGT (WMD: 0.48 U/L, 95% CI: - 2.71 to 3.67, P=0.76), and ALP levels (WMD: 2.85 U/L, 95% CI: -7.94 to 13.63, P=0.60) compared to the placebo group.

**Conclusion:** Our data showed that astaxanthin supplementation increases ALT concentrations in adults without affecting the levels of other liver enzymes. Further long-term and well-designed RCTs are necessary to assess and confirm these findings.

**Keywords:** Astaxanthin; Aspartate aminotransferase; Alanine aminotransferase; Meta-analysis.



## THE EFFECTS OF GARCINIA CAMBOGIA (HYDROXYCITRIC ACID) ON SERUM LEPTIN CONCENTRATIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** The observed impacts of *Garcinia cambogia* (GC) on leptin serum levels display inconsistency. We performed a meta-analysis of randomized controlled trials (RCTs) to evaluate the effectiveness of GC on serum leptin levels.

**Methods:** A thorough literature search was carried out using different internet databases, including Scopus, Web of Science, PubMed, and Google Scholar, up until February 9, 2023. Using random effects, weighted mean differences (WMDs) and corresponding 95% confidence intervals (CIs) were computed. Standard procedures were followed to account for publication bias, study quality, and statistical heterogeneity.

**Results:** In this meta-analysis, a total of eight eligible trials with 330 participants were ultimately included. Our analysis showed a significantly decreased effect of GC on leptin compared with the placebo (WMD: -5.01 ng/ml; 95% CI: -9.22 to -0.80,  $p=0.02$ ). Sub-group analysis based on BMI status showed that GC consumption reduces leptin when used for obese subjects (WMD: -7.81 ng/ml; 95% CI: -10.03 to -5.58,  $p<0.001$ ), also, the mean age of participants  $\geq 30$  years showed that GC consumption may significantly reduce leptin levels (WMD: -7.43 ng/ml; 95% CI: -9.31 to -5.56,  $p<0.001$ ), and trials, conducted in both genders (WMD: -5.70 ng/ml; 95% CI: -7.37 to -4.03,  $p<0.001$ ).

**Conclusion:** The findings of the present study show a significant decrease in leptin levels following GC administration which may be beneficial for protecting people from obesity and its metabolic complications. Enhanced effects were found among individuals aged over 30, obese people, and both genders. To confirm our findings, further high-quality research is required.

**Keywords:** *Garcinia cambogia*, Leptin, meta-analysis, randomized controlled trial



## DRINKING WATER, ONE OF THE STRATEGIES FOR WEIGHT MANAGEMENT

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**Background and Aim:** This study aimed to review the association between water consumption and the management of obesity and overweight.

**Methods:** A comprehensive literature search was conducted using databases such as PubMed, Scopus, Google Scholar, and Web of Science. The search was limited to articles published in English between 2000 and 2023. The keywords used for the search included "Water," "Obesity," "Insulin," and "Weight management." Among n=1463 initially identified articles due to the exclusion and inclusion factors, 17 articles had the eligibility to be used in the current study.

**Results:** The results of the review indicate that there is no absolute evidence describing the relationship between obesity and overweight management and drinking water. However, some reasons have been attributed to explain this association, including the fact that drinking water results in lower energy intake due to its 0-calorie content compared to other beverages. Additionally, water consumption accelerates the rate of fat oxidation, as it has a glycemic index of 0 and does not trigger insulin, allowing rate-limiting enzymes to break down triglycerides.

**Conclusion:** In conclusion, while the exact reasons for the association between water intake and weight management are not yet clear, there are two main hypotheses: water intake results in lower energy intake and accelerates the rate of fat oxidation. Governments should consider promoting water consumption as a cheap and effective way to combat obesity and related diseases to improve the overall health of their populations.

**Keywords:** Water, Obesity, Insulin, Weight management





## INVESTIGATING THE STATE OF FOOD SECURITY AMONG THE STUDENTS OF SHAHID BEHESHTI UNIVERSITY OF MEDICAL SCIENCES AND ITS ASSOCIATION WITH DEPRESSION, ANXIETY AND STRESS IN 2022

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**Background and Aim:** In recent years there has been growing concern regarding the prevalence of food insecurity among university students. This issue has been recognized to affect mental health. However, the conducted studies in Iran have not included a sufficient number of students to draw conclusive results. The objective of this study is to examine the correlation between food security and depression, anxiety and stress among students of Shahid Beheshti University of Medical Sciences.

**Methods:** This cross-sectional study involved 600 university students from various institutions within Shahid Beheshti University of Medical Sciences. Standardized assessment tools such as Depression, Anxiety, and Stress 42-item Scale (DASS-42) employed to measure the levels of depression, anxiety and stress and Household Food Insecurity Access Scale (HFIAS) evaluating food security. The collected data analyzed using SPSS-23, incorporating Chi-squared, Mann-Whitney and Kruskal-Wallis tests.

**Results:** According to the findings, 79% of participants are food insecure. The relationship between food security and depression, anxiety, and stress is significantly strong ( $P=0.000$ ). By applying confounding variables, significant relationship between food security and gender, academic degree, school of studying, type of field, tuition status, living status, house possession status, household and student income, employment status and number of children was seen ( $P<0.05$ ).

**Conclusion:** Despite the presence of limitations, the study reveals that students are experiencing an inadequate level of food security. Furthermore, a significant association exists between food security and three aspects of mental health, highlighting the urgent need for intervention to identify the underlying causes of food insecurity and address the resultant mental health concerns.

**Keywords:** Food security; Depression; Anxiety; Stress; Students



## THE MAGNITUDE AND IMPORTANCE OF FOOD WASTE IN IRANIAN HOSPITALS

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**Background and Aim:** Hospital food waste is associated with poor intake, financial loss and environmental consequences, but data in national level is insufficient. Thus, this study aimed to determine food waste's magnitude, and its nutritional, ecological and monetary outcomes.

**Methods:** A cross-sectional study was designed to quantify food waste in medical and surgical wards (n=171). Food wastes were measured for each patient for one day. Demographic, medical and nutritional data were collected. Finally, nutritional, ecological and financial outcomes were calculated. The potential factors contributing in food waste were assessed using linear regression model.

**Results:** The findings showed that half of the food is discarded by patients (0.540 Kg) and lunch had the highest amount of wastage ( $0.364 \pm 0.257$  Kg or 51.4%) and environmental consequences. Food waste mostly included rice. Severe malnutrition was a contributing factor in food waste. Food waste costs \$0.8 per patient per day. In addition, food waste resulted in 8.1 m<sup>2</sup> land use, 1.4 kg CO<sub>2</sub>-equivalent greenhouse gas emission, and 1003 Liter water use.

**Conclusion:** The magnitude of food waste in hospitals warns about nutritional, environmental and financial loss and it should be considered in health policies.

**Keywords:** Food waste, hospital, plate waste, carbon footprint, ecological footprint, water footprint



## BEYOND NOURISHMENT: THE LINK BETWEEN BREASTFEEDING AND POSTPARTUM DEPRESSION PREVENTION

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**Background and Aim:** Recent research suggests a bidirectional link between PPD and breastfeeding frequency. This study aims to review the possible causes of this phenomenon.

**Methods:** A comprehensive literature search was conducted using databases such as Scopus, PubMed, Web of Science, Science Direct, Irandoc, and Google Scholar from 2000 to 2023. The keywords were “breastfeeding”, “postpartum depression”, “maternity hormones”, and “micronutrients”. Among n=386 initially identified articles due to the exclusion and inclusion factors, 21 articles had the eligibility to be used in the current study.

**Results:** The primary link between breastfeeding (BF) and postpartum depression (PPD) is in hormonal and psychological factors. Prolactin and Oxytocin have antidepressant properties and are released during BF. This process can also decrease stress responses by lowering stress hormone levels, enhanced by skin-to-skin contact. BF has been demonstrated to restrict the activation of the secretion of glucocorticoids. During pregnancy, women store retinoids in their livers and breasts for lactation. High concentrations of retinoids are linked with cognitive impairments and mood disorders, including depression and suicidal tendencies. Furthermore, extended periods of lactation deplete the mother's retinoid reserves. Nutrient-rich diets that boost the PPAR-allopregnanolone axis and reduce inflammation, could provide a nutritional approach to preventing and treating mood disorders, including postpartum depression (PPD).

**Conclusion:** Breastfeeding's impact on postpartum depression is multifaceted, involving hormonal, psychological, and nutritional aspects. It's suggested that a nutrient-rich diet that enhances the PPAR-allopregnanolone axis and reduces inflammation could treat mood disorders, including PPD.

**Keywords:** Breastfeeding, Postpartum Depression, PPAR, Micronutrients, Vitamin A



## CHALLENGES AND SOLUTIONS RELATED TO PHYSICAL ACTIVITY IN ARBAEEN HOSSEINI WALKING: A QUALITATIVE STUDY

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**Background and Aim:** Arbaeen walk is one of the largest human gatherings in the world. Examining the health challenges associated with participating in the Arbaeen walk and finding solutions to face these challenges can lead to a better holding of this ceremony.

**Methods:** This research was carried out in qualitative research strategy. The subjects were selected among the experts in the field of sports by easy sampling method, and questions related to the challenges and solutions of physical activity in the Arbaeen Hosseini walk were taken from them through an online interview. After checking the inclusion criteria, 29 people were included in the study for data analysis with thematic analysis (TA) method. Data acceptability and objectivity criteria were used to evaluate the qualitative data of the research.

**Results:** All of participants was 29 and the mean and standard deviation of age was  $25.47 \pm 5.95$  years. Using the six-step thematic analysis method to analyze the interviews showed that the themes related to physical challenges and facilities in the Arbaeen walk included injury, weakness and fatigue, lack of environmental health facilities, crowding. The themes related to physical activity in the Arbaeen walk showed three main concepts related to nutritional, physical care and management strategies in the Arbaeen walk.

**Conclusion:** In the present study, important and detailed challenges and solutions were presented to reduce problems caused by long-term physical activity in Arbaeen walking. Therefore, planning for preventive, control and intervention measures in Arbaeen pilgrims seems necessary. planning for this issue requires the attention and cooperation of officials, managers and experts.

**Keywords:** Challenge- Physical Activity- Arbaeen- Pilgrimage- Approach



## PREVALENCE OF MALNUTRITION IN ADOLESCENTS WITH AUTISM SPECTRUM DISORDER

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**Background and Aim:** Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by challenges in social interaction, communication, and repetitive behavior. Children with ASD are susceptible to nutritional issues that can have short and long-term impacts on growth and anthropometric measurements. This study aimed to determine the prevalence of malnutrition in adolescents with ASD.

**Methods:** A cross-sectional study was conducted on 81 adolescents referred to the Sub-specialized and Specialized Autism Akbar Children's Hospital at Mashhad University of Medical Sciences, Iran, to assess the prevalence of malnutrition indicators. Standard protocols were used to measure weight and height, and z-scores were calculated for anthropometric indices. The parents were interviewed to gather information about nutritional problems.

**Results:** Among the participants, 3.7% experienced diarrhea, 33.3% had constipation, 4.9% had reflux and 1.2% had steatorrhea. The prevalence of food neophobia and food allergy was 16%. In terms of appetite, 18.5% had poor appetite, 23.5% had moderate appetite, and 58% had good appetite. Based on standardized z-scores, the overall prevalence of underweight, risk of overweight, overweight, and obesity was 12.3%, 22.2%, 1.2%, and 7.4%, respectively. Additionally, 4.9% of participants exhibited stunting.

**Conclusion:** Based on the aforementioned prevalence rates, addressing nutritional problems and improving anthropometric indices in adolescents with ASD is of utmost importance.

**Keywords:** Autism disorder, Adolescents, Malnutrition



## THE EFFECT OF DIETARY PATTERNS ON ANTHROPOMETRIC INDICATORS

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**Background and Aim:** Dietary pattern analysis is an effective process for understanding the complex relationship between diet and health or disease. There is a growing awareness that dietary habits and eating patterns affect the risk of overweight and obesity and subsequently metabolic diseases.

**Methods:** 200 subjects were enrolled in this study. The food frequency questionnaire was completed with a face-to-face survey. Also, anthropometric indices including height, weight, waist and hip circumference were measured and recorded. Three major dietary patterns defined as "healthy", "western" and "animal protein" were extracted by using the factor analysis method.

**Results:** The average body mass index, weight and waist circumference in the studied subjects were 30.87 kg/m<sup>2</sup>, 80.1 kg and 100.53 Cm, respectively. In addition average weight, body mass index, waist circumference, Waist-to-hip Ratio showed a significant increase in the highest quartile of the western dietary pattern compared to the lowest quartile. The average height of people in the highest quartile of the healthy dietary pattern and animal protein dietary pattern was significantly higher than the lowest quartile.

**Conclusion:** This study suggests that the western dietary pattern has an intensifying effect on the results of anthropometric indices. On the other hand, due to the direct relationship of these indicators with metabolic and chronic diseases as well as other consequences of obesity, the restriction of this type of dietary pattern may have a protective effect against the aforementioned consequences.

**Keywords:** Dietary Patterns, factor analysis, Anthropometric Indicators, BMI



## DO IMPROVEMENTS IN DIETARY POLICIES AFFECT HEALTH STATUS OF GOLGOHAR EMPLOYEES: A STUDY PROTOCOL FOR GOLGOHAR LIFESTYLE PROJECT

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**Background and Aim:** Unhealthy dietary habits are especially prevalent among industrial workers. Previous evidence had shown a high rate of overweight and cardiometabolic diseases among this population, but, no previous investigation has evaluated dietary habits among Golgohar employees. More importantly, no action has been taken to improve the situation. Therefore, the aim of the present study is 1) to assess current dietary-related risk factors and 2) to provide a comprehensive plan to improve dietary attitudes among Golgohar employees.

**Methods:** The study will be performed in two phases and will include all Golgohar employees. The first phase will be assessing the current situation e.g., evaluating the risk of non-communicable diseases among personnel and per capita consumption of frequently consumed unhealthy foods in affiliated restaurants. The second phase will be done in two steps; firstly, we will prepare a personalized health report card for each employee based on his/her anthropometric indexes and annual occupational medicine reports. Every person will be notified of their report. In the second step, the aim will be modifying unhealthy behaviors through personalized diet therapy, and education workshops. Redesigning restaurant's menus based on My Plate will be done as well.

**Results:** The present study will be the first to focus on dietary behaviors in an industrial company. Our findings will be helpful to provide some information on the current situation in Golgohar Mining and Industrial Company

**Conclusion:** More importantly, a big step to improve the diet, quality of life, health status, and working capacity of industrial workers.

**Keywords:** Industrial workers, Golgohar, dietary habits, lifestyle, protocol



## DISORDERED EATING ATTITUDES AMONG IRANIAN UNIVERSITY STUDENTS OF MEDICAL SCIENCES: THE ROLE OF BODY IMAGE PERCEPTION

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**Background and Aim:** This research was designed to investigate the role of body image satisfaction in the relationship with eating attitudes among students of Qazvin University of Medical Sciences in Iran

**Methods:** In this cross-sectional study, 385 Qazvin university students of medical sciences were recruited by randomized stratified sampling in 2014. The students completed a threepart questionnaire (socio-demographic, Eating Attitudes Test and Body Shape Questionnaire) in their classrooms

**Results:** The mean age of the students was  $21.80 \pm 2.98$  years. Mean scores for the Eating Attitudes Test and Body Shape Questionnaire were  $66.75 \pm 29.8$  and  $11.86 \pm 10.97$  respectively; 18.5% of students had a score of 20 and above (20) that indicated disordered eating attitudes or as being at risk of eating disorders. In the multiple regression model, the Eating Attitudes Test was related to screening body image dissatisfaction ( $b = 0.122$ ,  $P < 0.001$ ). Body mass index was negatively related to the Eating Attitudes Test score ( $b = -0.488$ ,  $P < 0.016$ ), and diet was significantly correlated with an increased Eating Attitudes Test score ( $b = 5.803$ ,  $P < 0.001$ ).

**Conclusion:** The risk of eating disorders is relatively high among Iranian university students. It can be a warning to health policy makers and should be the focus of special attention. In the present study, the most important factor related to abnormal eating attitudes was body image dissatisfaction. Regarding the complexity of the causes of eating disorders, various preventive and therapeutic interventions are necessary to avoid the dissemination in society of an idealized view of excessive thinness and further unfavorable outcomes in college students.

**Keywords:** Disordered eating attitudes, body image, obesity, students, self-perception





## EFFECTS OF VITAMIN D FORTIFICATION STRATEGIES ON THE SERUM VITAMIN D LEVELS: A SYSTEMATIC REVIEW META-ANALYSIS

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**Background and Aim:** Vitamin D plays an important role in bone health, being necessary for calcium absorption. We aimed to evaluate the effectiveness of vitamin D-fortified products on improvement of 25-hydroxyvitamin D [25(OH)D] levels and reduction of vitamin D-related health problems.

**Methods:** We conducted a systematic review and meta-analysis of randomized controlled trials (RCTs) evaluating the effect of vitamin D fortified food products intakes compared to control group among healthy adults. Searches to identify relevant articles were developed throughout Scopus, PubMed/Medline, Web of Science, and Google Scholar databases. All statistical analysis was performed employing STATA 17.0.

**Results:** We identified 1706 studies in a preliminary search. After removing duplicate papers, 800 remaining records were screened by two independent reviewers. Ultimately, six articles were included in present meta-analysis. The eligible RCTs assessed the fortification of bread, cheese, oil, and yogurt compared with control. The meta-analysis revealed that food fortification improved 25(OH)D concentration by a weighted mean difference (WMD) of 34.84 (95% confidence interval (CI) 25.91, 43.78, I<sup>2</sup> = 98.4%). The results were not changed based on the study location, duration of intervention, type of vehicle, dose of the fortificant, and sex and number of participants subgroups. In addition, no significant difference was observed after performing the sensitivity analysis.

**Conclusion:** The findings suggest that vitamin D fortification were demonstrated a significant increasing Serum-25(OH)D concentration. These findings can be usable for policy-makers to tackle vitamin D deficiency through food fortification strategy.

**Keywords:** Vitamin D; Fortification; Effect; Meta-Analysis.



## EXERCISE AND VITAMIN D: A REVIEW OF THE EVIDENCE, POTENTIAL MECHANISMS, AND IMPLICATIONS FOR HUMAN HEALTH

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**Background and Aim:** Exercise and vitamin D are two important factors that have been extensively studied in relation to human health. This review aims to provide a comprehensive overview of the evidence, potential mechanisms, and implications of exercise and vitamin D on human health

**Methods:** . A systematic search was conducted using electronic databases, including PubMed, Scopus, and Web of Science, to identify relevant studies published between 2010 and 2023. The search terms used included «exercise,» «physical activity,» «vitamin D,» and «human health.» A total of 50 studies met the inclusion criteria and were included in this review. Exercise also plays a crucial role in maintaining musculoskeletal health, including bone density, muscle strength, and flexibility

**Results:** physical activity has been shown to enhance immune function, improve mental well-being, and contribute to better metabolic health by reducing the risk of obesity, type 2 diabetes, and metabolic syndrome. Vitamin D, often referred to as the «sunshine vitamin,» is synthesized in the skin upon exposure to sunlight. It also plays a vital role in various physiological processes. Moreover, vitamin D may play a role in modulating exercise performance, muscle function, and recovery. However, further research is needed to elucidate the precise mechanisms

**Conclusion:** underlying the interaction between exercise and vitamin D and their combined effects on human health. Additionally, optimal exercise regimens and vitamin D supplementation strategies for different populations and health conditions warrant further investigation. In conclusion, exercise and vitamin D have significant implications for human health.

**Keywords:** Exercise, Vitamin D, human health



## THE EFFECT OF SIX WEEKS CURCUMIN SUPPLEMENTATION AND INTERVAL TRAINING ON GENE EXPRESSION OF GASTRIC INHIBITORY PEPTIDE IN INTESTINE OF MALE RAT CONSUMPTING HIGH-FAT DIET

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**Background and Aim:** Obesity is one of the most common metabolic disorders that in addition to increasing body fat stores causes metabolic changes such as insulin resistance and diabetes. One of the effective factors in increasing the production of food-dependent insulin is gastric inhibitory peptide (GIP) secreted by intestinal cells. The aim of this study was to investigate the effect of six weeks of intermittent exercise and curcumin consumption on the expression of GIP gene in the intestine of male rats fed with a high-fat diet.

**Methods:** In a quasi-experimental study, 60 male Wistar rats (age 10 weeks, weight range 220-250 g) randomized into 6 groups (n=10 for all groups). 1) Control (standard diet), 2) Eight weeks of high-fat diet, 3) 14 weeks of high-fat diet, 4) Intermittent exercise, 5) Curcumin, 6) Combination of intermittent exercise and curcumin. Intermittent training consisted of 5-12\*60s interval running on a treadmill at 75-100% maximal running speed with 75s of active rest between the intervals. Curcumin at a dose of 50 mg per kg of body weight was fed to the rats by gavage. After 14 weeks of intervention, plasma glucose concentration, body weight and GIP gene expression were measured. Data were analyzed using one-way analysis of variance at the significant level ( $p \leq 0.05$ ).

**Results:** six weeks of intermittent exercise with curcumin consumption significantly reduced body weight, blood glucose, and GIP gene expression compared to the high-fat diet group ( $p= 0.0001$ )

**Conclusion:** intermittent exercise with curcumin use is a more effective way to reduce GIP expression, reduce body weight and blood sugar in high fat mice.

**Keywords:** Interval training, Curcumin, GIP, High-fat diet



## IS DIETARY TOTAL ANTIOXIDANT CAPACITY ASSOCIATED WITH PERFORMANCE IN SEMI-PROFESSIONAL SOCCER PLAYERS?

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**Background and Aim:** Soccer is the most popular sport worldwide. As soccer players are highly faced with physical injuries, there are evidences indicating the role of an appropriate dietary plan particularly antioxidants for soccer players to improve recovery after injury as well as performance. The present study aimed to determine the link between dietary antioxidant capacity and functional performance in semi-professional adult soccer players in Tehran.

**Methods:** In this cross-sectional study, 109 semi-professional male soccer players aged 18-25 in Tehran were randomly selected. Weight, height and, body composition using a body analyzer were measured. All the players completed a validated 168-item food frequency questionnaire (FFQ) and data was analyzed by a nutritionist using Nutritionist IV software. Subsequently, dietary total antioxidant capacity (DTAC) was estimated. Lower body muscle power using countermovement jump tests and aerobic capacity through the Queen's College Step Test were assessed.

**Results:** Mean jump height and maximum oxygen consumption were  $37.09 \pm 4.92$  cm and  $59.28 \pm 42.8$  ml/kg/min, respectively. Mean DTAC was  $38.97 \pm 22.94$  mmol and significant differences in FFM were found among DTAC quartiles ( $p = 0.026$ ), respectively. Moreover, DTAC was significantly correlated with jump height ( $r = -0.203$ ,  $p = 0.034$ )

**Conclusion:** It is concluded that the soccer player consumed a diverse dietary regimen with a high DTAC. This could contribute not only to enhancing body composition and diminishing oxidative stress but also positively influencing sports performance.

**Keywords:** Soccer, Dietary Total Antioxidant Capacity, Performance



## INNOVATIVE APPROACHES IN EXTRACTING EDIBLE OILS FROM NUTS AND THEIR EFFECT ON THE QUALITY AND NUTRITIONAL PROPERTIES OF THE FINAL PRODUCT

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**Background and Aim:** This article aims to explore innovative approaches for extracting edible oils from nuts and their impact on the final product's quality and nutritional properties. The focus is on the growing interest in nuts due to their high oil content and unique fatty acids with positive effects on health. Additionally, the article discusses the traditional methods of oil extraction and their disadvantages, leading to the development of modern, sustainable, and environmentally friendly extraction technologies such as supercritical solvents, ultrasonic, microwave, and enzyme-assisted extraction. The objective is to compare these emerging methods with conventional techniques, highlighting their efficiency, properties, and the lipid profile of the extracted oils. Furthermore, the abstract aims to delve deeper into the discussion of biological solvents, ionic liquids, and eutectic solvents as emerging methods for oil extraction from nuts.

**Methods:** Nuts have garnered significant attention from scientific and specialized societies due to their high oil content (ranging from 40-80%, depending on the type of nut) and the presence of special fatty acids with beneficial biological properties that positively impact blood lipids and lipoproteins. These attributes have positioned nuts as a subject of interest in the nutrition and food industries. Furthermore, the different flavors and combinations of healthy fatty acids present in nut oils have led to their utilization in the development of new cream formulas within the cosmetics and health industries. The primary components of nut oil consist of triacylglycerol (comprising 96 to 98% of the oil) along with smaller amounts of diacylglycerol, monoacylglycerol, and free fatty acids. Nuts are rich in unsaturated fatty acids, particularly monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA), with small quantities of saturated fatty acids, and are abundant in other essential nutrients. Additionally, nut oil contains significant amounts of sterols (mainly beta-sitosterol, stigmasterol, campesterol, and  $\Delta^5$ -onesterol), fat-soluble vitamins (such as vitamins K, A, D, and E), and phenolic compounds that offer various health benefits. Traditional vegetable oil extraction methods like mechanical pressing and solvents have disadvantages like longer durations and environmental damage. High temperatures, toxicity, and evaporation require evaporation, affecting nutritional value, off-flavour, and oxidative stability. Innovative, environmentally friendly technologies like supercritical solvents, ultrasonic, microwave, and enzyme-assisted extraction have emerged for healthier



oils. Supercritical solvents leverage the properties of solvents to enhance the extraction of analytes from samples, utilizing temperatures and pressures higher than the solvent's critical point. Ultrasonic extraction involves the use of sound waves to disintegrate plant tissue and facilitate oil extraction. Microwave extraction causes physical changes in the texture of nuts, thereby improving extraction efficiency. Enzyme-assisted extraction utilizes specific enzymes to enhance analyte extraction by breaking down polysaccharides and cell walls. These modern sustainable processes, categorized as green extraction methods based on the principles of "green chemistry" and "green engineering," offer several advantages over traditional methods. These include reduced extraction times, high reproducibility, decreased solvent consumption, minimal environmental impact, process simplification, higher purity, and reduced energy consumption. These technologies yield oils of superior quality that are less susceptible to oxidation processes. In the subsequent discussion, emerging methods will be thoroughly examined, focusing on biological solvents, ionic liquids, and eutectic solvents. Additionally, the most widely used conventional extraction techniques will be compared with emerging technologies in terms of efficiency, properties, and the lipid profile of oils extracted from nuts.

**Conclusion:** In conclusion, the extraction of oils from nuts is a topic of great interest due to the nutritional and health benefits they offer. The traditional methods of extraction have limitations, including environmental impact and extended extraction times. However, the development of emerging technologies such as supercritical solvents, ultrasonic, microwave, and enzyme-assisted extraction presents promising alternatives. These green extraction methods offer numerous advantages, including reduced extraction times, minimal environmental impact, and higher oil quality. The discussion of biological solvents, ionic liquids, and eutectic solvents, along with a comparison of conventional and emerging extraction techniques, provides valuable insights into the efficiency and properties of nut oils. Overall, the use of modern sustainable processes represents a significant advancement in the extraction of oils from nuts, with the potential to enhance the nutritional value and quality of the oils while minimizing environmental impact. Further research and development in this area will undoubtedly contribute to the continued improvement of nut oil extraction methods.

**Keywords:** Nut oils, extraction methods, green extraction, sustainable processes, emerging technologies.



## NANOPARTICLES FOR DELIVERY OF VITAMIN D: A COMPREHENSIVE REVIEW

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**Background and Aim:** Vitamin D, calcitriol, is an essential vitamin for a healthy body. However, due to an unfavorable chemical environment in the gastrointestinal tract, its bio-availability may decrease. To prevent vitamin D deficiency, organic and inorganic nanocarriers can be used for vitamin D delivery. Nanocarriers are particles less than 100 nanometers in size that can absorb and transfer nutrients and drugs to body cells. This review aims to collect and examine various types of vitamin D nanocarriers and their advantages and disadvantages of them.

**Methods:** This review study examines vitamin D nanocarriers from scientific databases such as Google Scholar and PubMed.

**Results:** Recent research in the field of vitamin delivery using various nanotechnology methods have been achieved, including Micelles, Poly lactic-co-glycolic acid (PLGA) and Polymers, Liposomes, and Inorganic methods. Micelles offer the best efficiency in vitamin D delivery. However, they may decompose under certain conditions. PLGA and Polymers are suitable options due to their controlled release ability, but they may require a long time for vitamin D release. Liposomes with a similar cell-like structure to the cell membrane and the ability to regulate size and controlled release can effectively deliver vitamin D. However, they may have limited stability in the biological environment. The use of non-organic materials provides significant absorption and transfer ability for vitamin D, but the use of mineral materials may lead to toxicity in the biological system. Choosing the appropriate method should be based on each case's specific needs and limitations.

**Conclusion:** Nanotechnology has made it possible to take advantage of the beneficial effects of this micronutrient. More fundamental studies are needed to take advantage of the great potential of nanotechnology for vitamin D delivery and optimize recommended systems for target tissues.

**Keywords:** nanocarriers; vitamin D; drug-delivery systems



## ARTIFICIAL INTELLIGENCE IN OBESITY

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**Background and Aim:** The prevalence of obesity, a global epidemic with multifactorial origins, is escalating, leading to severe health implications. Genetic predisposition accounts for 20-25% of obesity, while individual, behavioral, socioeconomic, and psychological factors contribute to the remaining risk. Obesity, characterized by excessive adipose tissue, heightens the risk of non-communicable diseases and premature death. Artificial intelligence (AI) is widely used in many human activities. AI can be defined as the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, decision-making and ...

**Methods:** The present study was a brief review study designed in 2023. The search was conducted through databases including PubMed and Google Scholar with the keywords "Artificial Intelligence" and "Obesity".

**Results:** The results of this study showed that in obesity management, machine learning methods such as logistic regression, decision tree analysis, artificial neural networks, and deep learning contribute to predicting risks and outcomes. Logistic regression and decision tree analysis are dedicated to classification, while artificial neural networks and deep learning extend their capabilities to predict continuous variables. Decision tree analysis has found applications in predicting postoperative success for bariatric surgery patients and forecasting childhood obesity in high-risk age groups. These tools offer not only predictive capabilities but also open avenues for monitoring and treatment, promising a more effective and personalized approach to obesity prevention and management.

**Conclusion:** The results of these studies show that AI emerges as a promising tool in predicting and preventing obesity. ML models, with their predictive prowess, analyze complex relationships between variables and process high-dimensional data. In conclusion, the integration of AI, particularly ML models, proves invaluable in the battle against obesity.

**Keywords:** "Artificial Intelligence" and "Obesity"





## THE IMPACT OF SERIOUS GAMES ON THE NUTRITIONAL KNOWLEDGE OF CHILDREN

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**Background and Aim:** The term "Serious Game" refers to a type of game which its main purpose is more than entertainment. As choosing healthier foods and reducing the consumption of processed foods lead to a healthier life, having accurate information about nutrition can improve the nutritional knowledge and practice of target populations, such as children. In this term, serious games can be defined as promising and innovative games using modern information technologies to increase nutritional knowledge among individuals. Therefore, the present study is designed to review the impact of serious games on children's nutritional knowledge

**Methods:** The present study was a brief review study designed in 2023. The search was conducted through electronic databases Scopus and Google Scholar with the keywords "Serious Games" and "Nutrition"

**Results:** 364 articles were included, and finally, 8 studies were reviewed to achieve the goals of the present study. The studies indicated that digital nutrition information was commonly sent to the population through social media and television, and non-digital information was mainly sent through schools and parents. Beyond the role of any technologies in nutritional education, studies showed the impact of serious games on more informed food choices and increased fruit and vegetable consumption in the target group. Serious games by influencing children's nutritional knowledge can play a significant role in promoting healthy eating behavior among them and be used as an effective tool for learning nutrition knowledge

**Conclusion:** According to the importance of healthy nutrition for children, having accurate nutritional knowledge and practice is a necessary issue. In this field, serious games seem a useful tool; however, further investigations are required to determine this educational method's features, benefits, barriers, limitations, and disadvantages

**Keywords:** "Serious Games"; "Nutrition"



## ULTRASOUND TECHNOLOGY AND NUTRITION: A REVIEW STUDY

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**Background and Aim:** Ultrasound technology has gained significant attention in the field of nutrition due to its ability to enhance various food processing operations. Ultrasound waves can disrupt cell structures, promote mass transfer, and modify the physico-chemical properties of food matrices. This review seeks to assess the effect of ultrasounds potential role in improving food quality, fortification, and preservation.

**Methods:** A comprehensive systematic search was done in electronic databases, including PubMed, Web of Science, and Scopus, using relevant keywords. Studies until 2023 were included. The screening process involved specific criteria, and data were extracted and analyzed.

**Results:** A number of studies met the inclusion criteria. The review identified several significant findings regarding the impact of ultrasound on nutrition. Ultrasound-assisted extraction techniques demonstrated improved nutrient release, increasing the availability of bioactive compounds such as antioxidants and vitamins. Additionally, ultrasound treatment showed potential in enhancing the bioaccessibility of nutrients, promoting their absorption and utilization by the human body.

**Conclusion:** Ultrasound technology has emerged as a promising tool for enhancing nutrition in the food industry. Ultrasound can potentially improve nutrient availability, bioaccessibility, and functional properties, contributing to the development of healthier and more nutritious food products. However, factors such as ultrasound parameters, food characteristics, and optimization of processing conditions require further investigation. Collaboration between researchers, food processors, and nutritionists is essential for harnessing the full potential of ultrasound technology in promoting a healthier diet.

**Keywords:** ultrasound; nutrition; food processing



## THE ROLE OF MHEALTH IN NUTRITIONAL PRINCIPLES OF CANCER PATIENTS UNDERGOING CHEMOTHERAPY

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**Background and Aim:** Mobile health has changed the shape of health care around the world and can play an important role in managing and providing care for cancer patients, such as managing side effects. The purpose of this study was to investigate the role of mHealth in nutritional principles of cancer patients undergoing chemotherapy.

**Methods:** This research was conducted as a systematic review and through searching in online databases such as Scopus, PubMed, ScienceDirect, Google Scholar, Web of Science and with keywords Mobile Health, Mhealth, E-Health, Chemotherapy, Cancer and Patient Education. Articles were extracted until the end of 2023. Also, any books, book chapters, letters to the editor, and conference abstracts were excluded from the study. Data collection was done using a researcher's checklist using Excel version 2019 software.

**Results:** The findings of the review of the present literature showed that with the design and the growing trend of health in chemotherapy patients, through mHealth, patients are taught to follow the principles of nutrition, the required food and when to consume that information through Mobile phone application and text messaging system. The patients were satisfied with the use of this system and by using this technology they said that they became more aware and could manage the side effects caused by the treatment based on the nutritional principles.

**Conclusion:** The results of the review of the present literature showed that mhealth in the field of cancer treatment leads to an increase in quality, a reduction in cost, and an improvement in the health of patients.

**Keywords:** Cancer, mHealth, chemotherapy



## COMPARING THE EFFECTS OF BARIATRIC SURGERY ON CARDIOMETABOLIC INDICES IN PATIENTS WITH MORBIDLY OBESE: A 12-MONTH FOLLOW-UP

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**Background and Aim:** Morbid obesity increases the risk of various diseases, including cardiovascular and metabolic diseases. Bariatric surgery is one of effective tools to achieve significant weight loss and reduce complications in individuals with morbidly obese. This study was designed and conducted in order to compare bariatric surgery on cardiometabolic indices.

**Methods:** In this retrospective cohort study, 77 individuals with morbidly obese, who underwent two types of obesity-related surgical techniques, including sleeve gastrectomy (SG) and Roux-en-Y Gastric Bypass (RYGB) were included. Cardiometabolic indices including Atherogenic Index of Plasma (AIP), Lipid Accumulation Product (LAP), Cardio-Metabolic Index (CMI), Lipoprotein Combine Index (LCI), Triglyceride-Glucose (TyG), TyG-BMI, TyG-WC were calculated before surgery and 12 months after surgery.

**Results:** The average BMI of the participants was  $44.42 \pm 5.27$ . Cardiometabolic indices significantly decreased in all two types of surgery ( $p < 0.05$ ). No significant different shown between two types of surgery on changes of Cardiometabolic indices during 12 months after surgery. Body mass index ( $15.65 \pm 3.60$  vs.  $13.16 \pm 2.95$ ,  $P = 0.02$ ) and fasting blood sugar ( $18.51 \pm 15.09$  vs.  $8.71 \pm 11.80$ ,  $P = 0.01$ ) levels showed a more decrease in RYGB than SG. Percentage of excess weight loss (%EWL) followed surgery had a most correlation with changes of TYG ( $r = 0.615$ ,  $P < 0.001$ ).

**Conclusion:** The findings of the present study showed that bariatric surgery can improve cardiometabolic indices in persons with morbidly obesity. On the other hand, the effect of Roux-en-Y Gastric Bypass showed a greater effect on body mass index and fasting blood sugar than sleeve gastrectomy surgery.

**Keywords:** Bariatric surgery, Cardiometabolic, Obesity



## INVESTIGATION ON ETHANOL-ULTRASOUND EXTRACT CONCENTRATION OF HELPEH (TEUCRIUM POLIUM) FOR STABILITY OF CANOLA OIL DURING STORAGE AT ROOM TEMPERATURE

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**Background and Aim:** The plant features Hlph and active ingredients in it, the aim of this study was to evaluate the dose and duration of maintenance of stability to Hlph new plant Li Ka Nola during the Nbardary oil is at room temperature.

**Methods:** The samples and control (without adding extract canola oil) for 60 days at 25 oC and at days 0, 15, 30, 45 and 60 the amount of peroxide value (AOCS cd8-25), iodine number (AOCScd1- 25), carbonyl number (AOCS cd8-22), polar compounds (AOCS Cc13c-50), OSI (AOCS Cd12b-92), acid number (AOCS cd3a-63) were measured.

**Results:** . The results showed that all measured parameters of the oxidative stability of the oil peroxide value, carbonyl number, acid number, the amount of polar compounds and phenol at a concentration of ppm 600, you had best performance

**Conclusion:** Analysis of the results of completely randomized design was done using SPSS software and all three repeat tests and comparison of Duncan test was carried out at 95%. The results of this study showed that the extract has antioxidant

**Keywords:** Oil oxidation, Antioxidants, Storage, canola oil, Hlph extract



## THE ASSOCIATION BETWEEN DIETARY ACID LOAD AND RISK OF ATTENTION-DEFICIT HYPERACTIVITY DISORDER: A CASE-CONTROL STUDY

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**Background and Aim:** Although previous studies have suggested that dietary acid load may be associated with mental health, the relationship between food-induced acid production and odds of attention-deficit hyperactivity disorder remains (ADHD) unclear. The aim of the present study was to evaluate the relationship between dietary renal acid load and odds of ADHD among children.

**Methods:** A case-control study was designed to assess the data of 500 children aged 4 to 12 years (200 children with diagnosed ADHD and 300 control group). Patients were clinically diagnosed according to the Diagnostic and Statistical Manual-5th Edition criteria. Subjects in the control group did not have any history of chronic diseases and they were screened for the absence of ADHD. Dietary intake was assessed by a semi-quantitative food frequency questionnaire.

**Results:** The odds of incident ADHD for each unit increase of potential acid load (PRAL) in the raw model showed ~9.8% (OR=1.098, 95% CI: 1.072, 1.125,  $p < .001$ ) higher odds of ADHD. In model 1, where age, gender, Body mass index (BMI), and socio-economic status were adjusted, the odds of ADHD was ~10.7% (OR= 1.107, 95% CI: 1.076, 1.140,  $p < .001$ ). Also, in model 2 (model 1 in addition to energy) the odds was ~10.8% (OR= 1.108, 95% CI: 1.065, 1.152,  $p < .001$ ).

**Conclusion:** Findings of the present study suggest a possible relationship between oxidative stresses and odds of development of ADHD. Furthermore, the size of the odds ratio is small. It appears that dietary considerations are warranted in order to ameliorate the impact and/or incidence of ADHD.

**Keywords:** Attention-deficit hyperactivity disorder, dietary renal acid load, case-control, potential renal acid.



## DIET COST PLAYS A KEY ROLE IN DETERMINING THE RISK OF PEDIATRIC ATTENTION DEFICIT HYPERACTIVITY DISORDER: FINDINGS FROM A CASE–CONTROL STUDY

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**Background and Aim:** The aim of our study was to assess the association between diet cost and attention deficit hyperactivity disorder (ADHD) in children.

**Methods:** This study was a case–control study conducted in Isfahan, Iran. Based on the Diagnostic and Statistical Manual of Mental Disorders-V criteria, a total of 200 children aged 4–12 years with ADHD and 300 age- and sex-matched children without ADHD, respectively, participated in case and control groups. A validated food frequency questionnaire that contained 168 food items was used to assess the dietary intake. The cost of food items was obtained from licensed markets. The food price was corrected for edible portion sizes as well as food weight changes due to cooking process. Our results indicated that diet cost per 1000 kcal was significantly lower in the case group compared with the control group ( $60,843.48 \pm 6987.83$  vs.  $67,828.33 \pm 8989.48$  Rials,  $p < .01$ ). In the crude model, a significantly lower risk of ADHD was observed in the higher quartiles of diet cost per 1000 kcal (odds ratio (OR) = 0.06; 95% confidence interval (CI) = 0.03, 0.13;  $p < .001$ ). This finding remained significant, even after adjustment for potential confounders such as age, gender, body mass index (BMI), socioeconomic status (SES), and intakes of eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and saturated fatty acids (SFA).

**Conclusion:** Therefore, it seems that the risk of ADHD is inversely associated with diet cost in children. Further studies, particularly longitudinal ones, are warranted.

**Keywords:** attention deficit hyperactivity disorder, case–control studies, diet cost, diet quality



## EFFECT OF WHEY PROTEIN SUPPLEMENTATION COMBINED WITH RESISTANCE TRAINING ON MUSCLE MASS IN THE ELDERLY: A SYSTEMATIC REVIEW

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**Background and Aim:** The loss of muscle mass associated with increasing age has various health ramifications, including the elevated risk for falls, fractures, frailty, poor quality of life, and mortality. Several studies have confirmed the effects of whey protein supplementation and RT (resistance training) for this age-related change independently, but whether a combination of the two produces a stronger effect remains controversial. This study aims to explore whether a combination of whey protein supplementation and RT leads to increase of muscle mass in the elderly.

**Methods:** We retrieved RCTs (randomized controlled trials) reporting the effects of whey protein supplementation combined with RT on muscle mass in the elderly, published before January 2024 through PubMed/ MEDLINE, Scopus and ISI web of science, and manual searches in Google scholar. Results: Six RCTs were included in this systematic review. The results of these studies showed that whey protein supplementation combine with RT significantly enhances the muscle mass of the older adults.

**Conclusion:** Compared to simple RT, protein supplementation combine with RT is more effective in enhancing the muscle mass.

**Keywords:** whey protein, resistance training, muscle mass, elderly, systematic review





## THE ASSOCIATION BETWEEN LIPID ACCUMULATION PRODUCT (LAP) INDEX AND LIVER FUNCTION IN PATIENTS WITH NAFLD: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Non-alcoholic fatty liver disease (NAFLD) is the leading cause of hepatic-associated morbidity. Regarding the inter-relationship between NAFLD and over-nutrition, obesity indices including anthropometric indices and body mass index (BMI) have been used in the assessment of NAFLD. Lipid accumulation product (LAP) index, as a novel, non-invasive and simple model, combines waist circumference (WC) and lipidemia and is applied in the assessment of metabolic disease. Hence, we aimed to study the association between LAP index and liver function markers in patients with NAFLD.

**Methods:** The protocol of this cross-sectional study was approved by IR.TBZMED. REC.1402.620. Two hundred thirty-two participants (96 men and 136 women) were included and divided into healthy, grade I and II NAFLD groups (based on ultrasonography findings). WC was measured and fasting triglyceride (TG), liver aminotransferases and ferritin levels were assessed. LAP index was calculated based on the formula.

**Results:** Among three studied groups including healthy, grade I and grade II subjects (n=19, n=101 and n=112, respectively), LAP values significantly increased along with the aggravation of liver steatosis ( $63.72 \pm 22.26$ ,  $84.57 \pm 44.96$  and  $112.14 \pm 56.97$ , respectively). Indeed, LAP was significantly and positively correlated with alanine aminotransferase (ALT), aspartate transaminase (AST) and ferritin levels ( $r=0.204$ ,  $p=0.002$ ), ( $r=0.170$ ,  $p=0.010$ ) and ( $r=0.130$ ,  $p=0.048$ ), respectively), meanwhile, we failed to document any correlation between LAP and AST/ALT ratio.

**Conclusion:** It appears that LAP index could be correlated with liver function markers (particularly in terms of ALT) and associated with hepatic steatosis in patients with NAFLD.

**Keywords:** Non-alcoholic fatty liver disease; LAP index; liver function; obesity indices



## HIGHER SUGAR SWEETENED BEVERAGES (SSBS) CONSUMPTION IS ASSOCIATED WITH INCREASED RISK OF DEPRESSION IN IRANIAN ADULTS

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**Background and Aim:** Although several studies have assessed sugar-sweetened beverages (SSBs) in relation to various chronic disease, data regarding their association with mental disorders are scarce. Therefore, in the present study, we aimed to evaluate the association of SSBs with depression and anxiety in a representative sample of Iranians.

**Methods:** This cross-sectional study was conducted within the framework of the Knowledge and Practice of Dyslipidemia Prevention, management, and control (LIPOKAP) project consisting of 2,033 eligible healthy adults. Dietary intake was assessed using a validated semi-quantitative food frequency questionnaire. Symptoms of anxiety and depression were assessed using a validated version of Hospital Anxiety and Depression Scale (HADS).

**Results:** In the high-median group, a marginal positive association was observed between SSB and risk of depression (OR= 1.24, 95% CI: 0.99, 1.55; P = 0.06), compared with the low-median group. The relationship was strengthened after considering various confounders (OR= 1.28, 95% CI: 1.01, 1.63; P = 0.044). The sex-stratified analysis indicated that while there was a significant positive correlation between SSB and depression in men, a null association was found in women. No association was found between SSB and risk of anxiety in the overall population or in either sex.

**Conclusion:** Higher consumption of SSB was associated with increased risk of depression in the overall population and males, but not females when examined separately. However, we did not observe any correlation in terms of anxiety. Further longitudinal studies are needed to confirm these findings.

**Keywords:** Sugar Sweetened Beverages; Depression; Anxiety; Iran



## GASTROINTESTINAL DISORDERS IN AUTISTIC CHILDREN AND ITS RELATIONSHIP WITH DIET

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**Background and Aim:** Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder with symptoms that appear throughout the patient's life and is the most prominent feature of autism. The problem is in social mutual understanding. ASD system is considered as a pervasive and systemic syndrome with various neurological, immunological, gastrointestinal and endocrine involvements.

**Methods:** The present study is the result of a systematic review that was conducted by searching scientific sites such as SID, Pubmed, Magiran and Google Scholar search engine with the keywords: autism, digestive disorders and autism diet in the years 2018 to 2022 and a total of 20 articles were reviewed.

**Results:** In ASD patients, the interaction between the brain and the gut is disrupted. It has been shown that more than half of autistic children have digestive disorders. The main symptoms are diarrhea and constipation And 41.9% of children with autism have a genetic predisposition to celiac disease. Children with ASD, who showed high levels of urinary peptides of food origin, indicate a disorder in protein digestion and increased intestinal permeability. Increased intestinal permeability leads to intensified reactions to food components. A long-term gluten-free and casein-free diet (2 to 4 years) leads to a significant decrease in urinary peptide levels and also to an improvement in behavioral measures.

**Conclusion:** In autism, the digestive system is altered and since there is a strong correlation between the symptoms of the disease and the severity of autism, the symptoms of the disease have been reduced by changes in the diet.

**Keywords:** autism/Digestive disorders of autism/ Autism diet/



## ASSOCIATION BETWEEN CARBONATED BEVERAGES INTAKE AND ANXIETY: FINDINGS FROM A POPULATION-BASED CROSS-SECTIONAL STUDY

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**Background and Aim:** Anxiety is among the most common mental disorders that can affect brain circuits. Nutrition may play a role in mental disorders, but the link between carbonated beverages and anxiety is unclear. We investigated the possible relationship between carbonated beverages intake and anxiety.

**Methods:** In this cross-sectional study a total 604 adults were recruited who were aged 18 to 65 years old (a mean age of 33.8) from different regions of Iran. Consumption of carbonated drinks was obtained using a standard Food Frequency Questionnaire. Anxiety symptoms were assessed by the Iranian validated short version of the self-reported questionnaire (Depression Anxiety Stress Scales 21 [DASS21]). To analyze the data in crude and adjusted models, we used multivariable logistic regression.

**Results:** No significant association between consumption of carbonated drinks and anxiety was observed in the crude model (OR = 1.589; 95% CI = 0.966-2.614, P-value = 0.68). This association remained not significant after adjusting for age, gender, smoking, BMI (Body Mass Index), and energy intake (OR = 1.462; 95% CI = 0.852-2.507, P-value = 0.168).

**Conclusion:** Although no significant relationship between carbonated beverages and anxiety disorders was found, these findings need to be investigated by prospective studies.

**Keywords:** Anxiety disorders, Carbonated beverages, Cross sectional, Iran



## IDEAL CARDIOVASCULAR HEALTH METRICS AND RISK OF TYPE 2 DIABETES: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF PROSPECTIVE COHORT STUDIES

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**Background and Aim:** Studies suggest a potential link between ideal cardiovascular health (CVH) and the risk of type 2 diabetes (T2D). However, systematic reviews are lacking to pool these data and present a balanced review about this association.

**Methods:** We performed a systematic search of PubMed/Medline, Web of Sciences, and Scopus from inception until November 2022 to search for prospective observational studies assessing the link between ideal CVH metrics, as introduced by the American Heart Association, and the risk of T2D in adults. Nine cohort studies with 78,912 participants and 6242 cases of T2D were included. The pooled relative risk of T2D for the highest versus the lowest category of ideal CVH metrics was 0.36 (95% confidence interval [CI]: 0.25, 0.47; risk difference: 5 fewer per 100 patients, 95% CI: 6 fewer, 4 fewer; Grading of Recommendations Assessment, Development and Evaluation certainty = high). Each unit increase in the components of the ideal CVH metrics was associated with a 20% lower risk of T2D. Dose-response meta-analysis indicated a monotonic inverse association between ideal CVH metrics and the risk of T2D. Results from analysis of individual components showed that having a normal weight, adopting a healthy diet, and having normal blood pressure levels were associated with a reduced risk of T2D.

**Conclusion:** Having an ideal CVH profile and a unit increase in any CVH metric are inversely associated with the risk of T2D.

**Keywords:** Ideal Cardiovascular Health Metrics, Type 2 Diabetes, Meta analysis



## ASSOCIATION BETWEEN INDIVIDUAL-SOCIAL CHARACTERISTICS AND BODY COMPOSITION INDICATORS WITH QUALITY OF LIFE IN WOMEN WITH OSTEOPOROSIS

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**Background and Aim:** Postmenopausal osteoporosis has emerged as a global phenomenon, exerting a significant impact on the quality of life of women. The aim of this study was to assess relationship between individual-social characteristics and body composition indicators with quality of life in women with osteoporosis.

**Methods:** This descriptive-analytical cross-sectional study was carried out on 109 postmenopausal women aged 50-65 years in Tabriz health centers from Sep 2018 to Jul 2019. Informed consent was obtained from all the patients and the questionnaires of demographic-social characteristics, obstetric and medical characteristics, and quality of life questionnaire (MENQOL) were completed. Data was analyzed using various statistical methods i.e., Pearson correlation, Kolmogorov-Smirnov test, one-way ANOVA, independent t-test, Spearman test, and linear regression.

**Results:** The mean (SD) age of the patients was  $58.13 \pm 3.74$  years. The mean (SD) age of menopause was  $9.2 \pm 5.2$  years. The analysis of relationship between individual-social characteristics and quality of life score revealed a significant difference between income level and quality of life score ( $p$ -value = 0.007). But no significant difference was found in terms of age groups ( $p$ -value = 0.950), marital status, education level, occupation, housing status, smoking status, exposure to sunlight, supplementation, exercise, and history of fractures in close relatives ( $p$ -value > 0.05). Moreover, there was no significant relationship between quality of life of women in the study with body composition indicators ( $P$ -value > 0.05).

**Conclusion:** The findings revealed that the quality of life of postmenopausal women with osteoporosis may not be influenced by individual-social characteristics and body composition indicators.

**Keywords:** Primary osteoporosis, Quality of life, Body composition



## THE RELATIONSHIP BETWEEN THE INDEX OF NUTRITIONAL QUALITY (INQ) AND PROSTATE CANCER RISK: A CASE-CONTROL STUDY

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**Background and Aim:** Prostate cancer (PC) is the most common type of cancer and the second leading cause of cancer death in men worldwide. Previous studies have reported dietary factors are its most modifiable risk factors. The index of nutritional quality (INQ) is considered as a general overview of the nutrient content of diet. The aim of this study is to determine the relationship between INQ and the risk of PC.

**Methods:** Overall, 205 hospital-based controls and 97 newly diagnosed PCa patients were studied in three major general hospitals in Tehran province, Iran. INQ scores were calculated based on information on the usual diet that was assessed by a valid and reliable Food Frequency Questionnaire (FFQ). Multivariate logistic regression was used to estimate the relationship between INQ scores and risk of PC.

**Results:** After controlling for several confounding factors, the INQ of vitamin E, C and niacin was associated with decreased risk of PC (OR VitE: 0.17 (0.08-0.38), OR VitC: 0.66 (0.52-0.84), OR Niacin: 0.56 (0.35-0.90)).

**Conclusion:** This study showed that people who consumed a diet rich in vitamin E, vitamin C, and niacin had a lower risk of PC compared to those who had a poor diet.

**Keywords:** Prostate cancer, Index of Nutritional Quality, Calcium, Vitamin C, Folate, Fiber



## THE EFFECT OF POSTBIOTICS ON CHILDREN'S FOOD ALLERGY SYMPTOMS: A SYSTEMATIC REVIEW

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**Background and Aim:** Food allergies (FAs) are a common public health issue that are caused by an immune response to proteins in food. They are most commonly observed in infants and young children. Approximately 5 to 10% of young children have FA, with the highest prevalence observed at one year of age. The good molecules known as postbiotics are created by probiotic bacteria and can strengthen the gastrointestinal tract and immune system. The aim of this study is to review the effect of postbiotics on children's food allergy symptoms.

**Methods:** We conducted a systematic review based on clinical trials published in PubMed, Web of Science, Science Direct, SID, and Google Scholar. The searches were performed using the key words "Food hypersensitivity," "food allergy," and "postbiotics" until December 2023.

**Results:** As a novel supporting strategy, postbiotics included enzymes, plasmalogens, butyrate, and SCFAs which can potentially be effective in the treatment of food allergy in children. The absence of SCFA receptors GPR109A and GPR43 may exacerbate allergic responses. Through similar mechanisms to probiotics, postbiotics such as *Lactobacillus kefiranofaciens* and *Lactobacillus kefir*, or Kefiran, could improve immunological tolerance. By strengthening Treg-mediated BMMC inhibition, postbiotics may be used to treat allergies to cow's milk proteins, such as OIT+butyrate.

**Conclusion:** Postbiotics appear to be a potentially effective intervention with fewer adverse effects for treating allergies in children and infants. However, more study is required on this subject.

**Keywords:** Food Hypersensitivity, Microbiota, Systematic Reviews as Topic





## EFFECT OF DARK CHOCOLATE/ COCOA FLAVONOIDS ON C-REACTIVE PROTEIN (CRP) IN PATIENTS WITH CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Dark chocolate (DC)/cocoa as a rich source of polyphenols like flavonoids has anti-inflammatory and antioxidant properties which may confer health benefits, but findings in this context are inconsistent. We systematically reviewed and analyzed randomized controlled trials (RCTs) investigating the effects of DC/cocoa on C-reactive protein (CRP) in patients with cardiovascular disease (CVD).

**Methods:** Databases including PubMed, Web of Science, and Scopus were searched until October 2023 for relevant studies. Based on a random-effects model, we calculated WMDs and 95% confidence intervals (CIs). Sensitivity, sub-group and meta-regression analyses were also conducted.

**Results:** 6 eligible RCTs with 8 treatment arms including 489 participants were included. DC/cocoa reduced CRP levels but the reduction wasn't significant (WMD: -0.177, 95% CI: -0.65, -0.3,  $p=0.468$ ).

**Conclusion:** DC/cocoa may reduce CRP levels in CVD patients. However, further studies should be investigated to determine the benefits of DC/cocoa on inflammation in CVD patients.

**Keywords:** Dark chocolate, cocoa, Cardiovascular disease, meta-analysis



## **NUTRITIONAL INTERVENTION BASED ON THE MODIFIED WCRF/AICR 2018 RECOMMENDATIONS IN ONCOLOGY OUTPATIENT REFERRED TO IMAM-REZA MEDICAL CLINIC OF SHIRAZ UNIVERSITY OF MEDICAL SCIENCES, SHIRAZ, IRAN.**

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**Background and Aim:** To study nutritional intervention based on the WCRF/AICR 2018 recommendations on weight loss and tumor markers of the most common gynecological outpatient cancers

**Methods:** This study was a RCT of ninety-two oncology patient were included hormone-positive breast (n = 53), endometrial (n = 5), ovarian cancer (n = 32) followed from summer 2020 till summer 2023. primary markers were weight and tumor markers CA15-3/CA27.29 and CA125. Secondary markers were Fasting Blood Sugar and Liver Function Test (LFT). markers measure were obtained at 3, and 6 months.

**Results:** There were significant reduction in fasting blood sugar, and improvement LFT and weight loss at 3 months (p=0.005). The great reduction in tumor markers occurred within the 6 months (p<0.001).

**Conclusion:** Be in healthy weight by calorie restriction, Eat diet rich in wholegrain, vegetables, fruits and beans, Avoid consumption of fast food and other process foods high in fat and sugars, Avoid consumption of red and process meat, Avoid consumption of sugary drinks and sweetened beverages and added sugars, Avoid alcohol consumption and do not recommend any dietary supplement or multivitamin and mineral supplement are important in nutritional intervention. Following these recommendation not only will help prevent other non-communicable disease but also increase quality of life of cancer patients.

**Keywords:** 2018 WCRF/AICR Cancer Prevention Recommendations, cancer risk, diet, lifestyle



## THE EFFECT OF BLACK MULBERRY ETHANOL EXTRACT ON LIVER FUNCTION, AND LIVER STEATOSIS IN HIGH-FAT DIET-INDUCED NAFLD RATS

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**Background and Aim:** Since there is no definitive treatment for NAFLD. However, previous studies have been shown that fruits and vegetables can be assumed as a substantial part in inflammatory markers' alleviation and improvement of patient with NAFLD. The goal of this study is to find out how black mulberry extract affects non-alcoholic fatty liver in rats that has been brought on by a high-fat diet.

**Methods:** Male rats have been utilized in this experiment, and they have been randomized into control and high-fat diet groups. Following the formation of NAFLD after four months of feeding with a high-fat diet, black mulberry extract at doses ranging from 150 to 600 mg/kg were administered to rats for eight weeks. In the current investigation, we evaluated weight, blood sugar, total cholesterol, triglycerides, and the activity of liver enzymes AST, ALT along with liver histology of rat.

**Results:** Administration of a high-fat diet lead to a raise in weight ( $P < 0.0001$ ), FPG ( $P < 0.0001$ ), triglyceride ( $P = 0.031$ ), cholesterol ( $P < 0.0001$ ), and a rise in AST's serum levels ( $P < 0.0001$ ) and ALT ( $P = 0.009$ ). Black mulberry extract at a dose of 600 mg substantially decreased weight ( $P = 0.008$ ), FPG ( $P < 0.0001$ ), cholesterol ( $P = 0.001$ ), ALT ( $P = 0.001$ ) and AST ( $P = 0.001$ ). In group receiving extract with a dose of 300 mg per day, Cholesterol ( $P = 0.014$ ), AST ( $P = 0.002$ ) as well as ALT ( $P = 0.057$ ) levels have also been decreased substantially. In another group, which get the dose of 150 mg of the extract, only AST ( $P = 0.0017$ ) as well as ALT ( $P < 0.0001$ ) indicators have been substantially improved.

**Conclusion:** Findings of the current investigation indicate that blackberry leaf extract provides therapeutic effects on NAFLD and might also be considered as a new approach for NAFLD therapy.

**Keywords:** Extract, Black mulberry, NAFLD, High-fat diet



## DIETARY ANTIOXIDANT INDEX AND THE ODDS OF BREAST CANCER IN IRANIAN WOMEN: A CASE-CONTROL STUDY

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**Background and Aim:** This study was conducted with the aim of investigating the relationship between the dietary antioxidant index (DAI) and the odds of breast cancer in Iranian women.

**Methods:** In this case-control study, 155 women with breast cancer and 155 apparently healthy women (age range of 18-70 years) were included in the study through convenient sampling. Both healthy and patient groups were collected from the Javad Al-Aemeh clinic in Kerman of Iran. DAI score was calculated based on dietary data obtained from the 168-item FFQ and according to 6 antioxidant nutrients (magnesium, selenium, zinc, vitamin A, vitamin C, and vitamin E). The linear regression along with modeling by adjusting confounding factors was used to determine the relationship between the DAI and pathobiological markers of breast cancer such as tumor size and KI67 marker. Also, the odds of breast cancer (95% CI) were investigated using logistic regression along with adjustment of confounding factors.

**Results:** The results of the present study showed that in both crude and adjusted models, an inverse relationship was seen between the DAI score and tumor size and KI67 marker, but this relationship was not significant ( $p \geq 0.05$ ). Also, the categorical DAI significantly reduced the odds of breast cancer in both crude and adjusted models (OR: 0.55, CI: 0.35-0.86,  $p = 0.009$  and OR: 0.35, CI: 0.15-0.78,  $p = 0.01$ , respectively).

**Conclusion:** According to the findings of this study, the odds of breast cancer decreased significantly with the increase in DAI score.

**Keywords:** Dietary Antioxidant Index, Breast Cancer, Pathobiological Markers, Women's Health



## ASSOCIATION OF DIETARY NETWORKS WITH APOLIPOPROTEIN B AND LDL-CHOLESTEROL IN A SAMPLE OF IRANIAN ADULTS

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**Background and Aim:** The aim of this study is to investigate the relationship between dietary networks with ApoB and LDL cholesterol

**Methods:** In this cross-sectional study, 850 participants were enrolled. Individuals aged between 20-65 years old were encouraged to participate in this study from Tehran.

**Results:** This GGM analysis identified three dietary networks, healthy, unhealthy and saturated fat networks. In network 1, a significant decrease in the ratio of triglyceride to HDL was seen as tertiles of dietary network1 increases ( $p = 0.025$ ). In network 2, no significant association was observed between different variables with this network. In network3, a significant increase was observed for APOB( $P=0.044$ ) and ratio of triglyceride to HDL( $P=0.031$ ) as tertiles of dietary network3 increases and in the ratio of LDL to ApoB, no significant results were obtained in any of the networks.

**Conclusion:** The purpose of this study is to investigate the Association of dietary networks with apolipoproteinB and LDL-cholesterol in a sample of Iranian adults. In the healthy network, a significant relationship was seen only between the ratio of triglycerides to HDL, In the unhealthy network, no significant relationship was seen in unhealthy network and in the network of saturated fatty acids, a significant relationship was seen in the variables of ratio of triglycerides to HDL and ApoB in tertiles.

**Keywords:** LDL, ApoB, lipoproteins, Diet, TG.



## BENEFICIAL EFFECTS OF CHIA SEED (*SALVIA HIS-PANICA L.*) CONSUMPTION IN METABOLIC SYNDROME: SYSTEMATIC REVIEW

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**Background and Aim:** chia is a main actor in this process due to its high nutritional and functional value and its chemical composition rich in PUFAs, mainly  $\omega$ -3, as well as protein, dietary fiber, and bioactive compounds. Chia has been explored in different research models for health and the prevention of human diseases. The aim of this review was to assess whether those effects are related to assess whether those effects are related to chia seeds are effective in improving the metabolic syndrome, and how powerful is this effect.

**Methods:** A systematic literature search was performed in MEDLINE via Pubmed, Web of Science (WOS) core collection, via PubMed, Web of Science (WOS) core collection, Scopus, and related articles. Keywords were "obesity", "body weight", "body mass index", "lipid metabolism", "LDL", "HDL", "VLDL", "insulin resistance", "glucose", "insulin", "hypertension", "arterial pressure", "Chia seeds", "Salvia hispanica", and other (non-MeSH) terms. All were used as indexing terms, like MESH and Entree (when available) and text words.

**Results:** 14 articles were identified and this review support the beneficial role of Chia Seed in promoting weight loss and improvements of obesity related risk factors and suggests a protective effect on the lipid profile, Glycemic indexes, also the most pronounced effect of CS consumption observed was a significant reduction in SBP although in some studies no between-group differences in SBP were observed

**Conclusion:** Most articles compared "Chia seeds" other strategies specially designed for MetS management. Our findings suggest that "Chia seeds" consumption are as good as the other strategies to manage MetS

**Keywords:** Chia seeds, Salvia hispanica, Metabolic syndrome, Dyslipidemia, Insulin resistance, Hypertension, Obesity , Systematic review



## COMPARING THE EFFECTIVENESS OF BACTERIAL AND FUNGAL PROBIOTICS ON ACUTE DIARRHEA IN CHILDREN: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** Diarrheal diseases are a leading cause of mortality and morbidity in developing countries. Probiotics are known to balance the human intestinal flora. probiotics can be used as an alternative treatment to acute diarrhea. This study was designed to evaluate the effects of fungal and bacterial probiotics on acute pediatric diarrhea.

**Methods:** This clinical trial was conducted on 90 children aged 2 to 5 years, who were referred to the Kashan Children's Hospital, for complaints of acute watery diarrhea. These children were randomly divided into three groups of 30. The first group received a standard daily treatment with ORS plus bacterial probiotics as a Kidilact® sachet containing 7 strains of Lactobacillus strains; the second group received ORS and fungal probiotics containing *Saccharomyces boulardii* as Ardeypharm Yomagi® capsule, 250 mg once a day and the third group used placebo along with standard oral rehydration therapy. The duration of treatment with probiotics or placebo was 5 days.

**Results:** The mean duration of diarrhea from onset of treatment to recovery was 2.80 days in the first group (bacterial probiotics), 3.17 days in the second group (fungal probiotics), and 4.43 days in the third group (placebo). A significant difference was observed in the duration of diarrhea after treatment between the three groups ( $P \leq 0.05$ ), so that the best effect was found in reducing the duration of diarrhea in the bacterial probiotic group, and the lowest effect was associated with the placebo group.

**Conclusion:** The use of probiotics in acute diarrhea in children could be effective in shortening the duration of diarrhea

**Keywords:** Diarrhea; Probiotic; Fungi; Bacteria; Children; Health.



## **POMEGRANATE PEEL SUPPLEMENTATION IMPROVES DEPRESSION, ANXIETY, AND STRESS SYMPTOMS OF PATIENTS WITH NON-ALCOHOLIC FATTY LIVER: A RANDOMIZED DOUBLE-BLIND CLINICAL TRIAL**

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**Background and Aim:** Nowadays, improving anxiety, depression, and stress is important in managing non-alcoholic fatty liver (NAFLD). Thus, this study aimed to evaluate eight weeks of pomegranate peel (PP) supplementation on depression, anxiety, and stress scale changes among NAFLD patients.

**Methods:** This randomized clinical trial was conducted on 76 NAFLD patients assigned to the PP (n=39) or placebo (n=37) groups. Participants received the pomegranate peel (1500 mg/day) or placebo for eight weeks. PP capsules were prepared from dry extract of PP by soaking. A diet with reduced calorie intake and healthy recommendations was given to all participants. The status of NAFLD was checked with two-dimensional elastography. Mental health was evaluated using depression, anxiety, and stress scale, and dietary intake was assessed by 3-day recall before and after the intervention.

**Results:** The average age of the participants was  $43.1 \pm 8.6$  years, of whom 51.3% were women. In the PP group, weight, liver stiffness, and hepatorenal sonography index changes significantly differed from the placebo group before and after adjusting potential covariates, including weight and physical activity ( $P < 0.001$ ). Depression and stress scores changed significantly in the PP group during the study before and after adjusting potential covariates ( $P = 0.002, 0.05$ , respectively). Anxiety score changes were insignificant between the two groups ( $P = 0.1$ ).

**Conclusion:** Based on the results, eight-week supplementation of pomegranate peel improved depression and stress symptoms among NAFLD patients.

**Keywords:** Fatty Liver, Pomegranate peel, Depression, Anxiety, Stress,





## IS THERE A RELATIONSHIP BETWEEN MATERNAL DEPRESSION AND INFANT'S GROWTH DURING BREASTFEEDING?

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**Background and Aim:** Approximately 300 million people worldwide suffer from depression, which is associated with disability, disease burden, and significant health care costs. Children's nutritional status can affect their growth. In developing countries, malnutrition is still a major issue, and it reduces the potential for individual, social, and economic development. This study aimed to investigate the relationship between breastfeeding depression and infant's growth.

**Methods:** The present study is a cross-sectional investigation conducted on 90 breastfeeding mothers and their 2-4 month old infants residing in Yasuj. Data collection in mothers was done by measuring anthropometric variables and by interviews through questionnaires. Maternal depression was measured by the Beck Depression Inventory, and neonatal physical growth was assessed by measuring head circumference, weight, and length Z-scores of 2-4 months old infants.

**Results:** There was no significant relationship between maternal depression score and Z scores of infants' weight, height, and head circumference ( $P>0.05$  for all). In different groups of education or occupation among mothers, there were no differences in depression scores of mothers and infants' growth ( $P>0.05$  for all). Maternal waist circumference correlated significantly with hip circumference, weight, and number of children ( $P<0.001$  for all).

**Conclusion:** This study showed that depressed mothers are concerned about their infant's optimal growth, despite their depression. However, it is helpful to track children's development and maternal depression over time (especially in underweight infants or depressed mothers) in several stages in order to gain more information in this regard.

**Keywords:** Mental health, Low birth weight, Depression, Cross-sectional studies



## THE ASSOCIATION OF LUTEIN WITH CELL GROWTH AND PROLIFERATION IN CANCER: A SYSTEMATIC REVIEW

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**Background and Aim:** Lutein is a xanthophyll carotenoid found abundantly in various fruits and vegetables, is a potent antioxidant, and anti-cancer properties. This systematic review aimed to assess the connection between dietary carotenoid lutein and the proliferation of cancer cells, and to achieve general results.

**Methods:** A thorough search of electronic multiple databases such as PubMed, Science Direct, Cochrane Library, Web of Science, Scopus, Google Scholar, and Google up the year 2022, was conducted using the keywords "cancer or tumor or neoplasm or carcinoma" and "lutein" in the title/abstract. Data extraction were performed independently by two reviewers.

**Results:** The review of 27 included studies showed that lutein reduced cell growth (4:5), and cell proliferation (21:22).

**Conclusion:** According to this review, lutein may prevent cancer progression by reducing growth and cell proliferation through different mechanisms.

**Keywords:** Lutein; cancer; neoplasm; proliferation; cell growth



## THE PROTECTIVE EFFECT OF CRANBERRY EXTRACT ON METABOLIC INDICES AND OXIDATIVE STRESS IN SERUM AND LIVER OF MALE RATS EXPOSED TO THE 900 AND 2400 MHZ ELECTROMAGNETIC FIELD

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**Background and Aim:** The aim of this study was to evaluate the protective effects of cranberry (CR) extract against the electromagnetic radiation (EMR) induced by mobile phone, Wi-Fi, and mobile phone-Wi-Fi (in adjunctive) on some metabolic indices, oxidative status of serum and liver and histopathologic of liver in male Wistar rats.

**Methods:** Fifty-six rats were divided into 8 groups (n = 7) and exposed to mobile phone, Wi-Fi, and mobile phone-Wi-Fi (mobile: 900 MHz, Wi-Fi: 2450 MHz; 2h/day during 30 consecutive days), and received 300 mg/kg normal saline (NS) and cranberry (CR).

**Results:** A significant increase was seen in fasting blood sugar (FBS) and triglyceride (TG) in three groups of NS/mobile, NS/Wi-Fi and NS/mobile/Wi-Fi. The increase in aspartate aminotransferase (AST) in the NS/mobile/Wi-Fi group and alanine transaminase (ALT) in the NS/Wi-Fi and NS/mobile/Wi-Fi groups were significant. The serum level of Malondialdehyde (MDA) was significantly increased in the NS/Wi-Fi and NS/mobile/Wi-Fi groups. In NS/mobile, NS/Wi-Fi and NS/mobile/Wi-Fi groups, the MDA levels of liver were significantly increased and superoxide dismutase (SOD) activities of serum and liver were significantly reduced. The glutathione peroxidase (GP-x) activities of liver also were significantly decreased in NS/mobile and NS/mobile/Wi-Fi. Cranberry extract administration (300 mg/kg) in EMR exposed rats prevented the increase in FBS, TG, ALT, AST in serum and MDA in serum and liver and restored the activities of GP-x and SOD groups in serum and liver.

**Conclusion:** Cranberry extract may improve metabolic indices by reduction of serum and liver oxidative stress induced by EMR.

**Keywords:** Cranberry, Oxidative, Metabolism, Electromagnetic radiation, Serum, liver



## THE EFFECT OF VITAMIN D3 ON SOME FACTORS RELATED TO SARCOPLASMIC RETICULUM STRESS IN THE LIVER TISSUE OF RATS INDUCED TO TYPE 2 DIABETES

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**Background and Aim:** The purpose of this research is to investigate 8 weeks of vitamin supplement consumption D3 was on endoplasmic reticulum stress of liver tissue of Wistar rats with type 2 diabetes. The purpose of this research is to investigate 8 weeks of vitamin supplement consumption D3 was on endoplasmic reticulum stress of liver tissue of Wistar rats with type 2 diabetes.

**Methods:** 24 Wistar rats with an average age of eight weeks and a weight range of 200 to 250 grams were subjected to high-fat diet (HFD) and standard for 6 weeks. 35 mg/kg streptozotocin (STZ) was injected subcutaneously to induce type 2 diabetes. Then they were randomly divided into 3 groups: 1) healthy control (8 heads), 2) diabetes control (8 heads), 3) diabetes + vitamin D3 (8 heads). Rats in vitamin D3 supplement group were injected intraperitoneally with 10000 IU/kg once a week.

**Results:** The findings of this study showed that after 8 weeks of intervention, there was no significant difference between the research groups in the level of ATF-6 protein expression in the liver tissue of male rats with type 2 diabetes. However, a significant increase in CHOP protein expression was observed in all groups compared to the healthy control group, and the highest increase was related to the diabetic control group.

**Conclusion:** However, a significant increase in CHOP protein expression was observed in all groups compared to the healthy control group, and the highest increase was in the diabetic control group.

**Keywords:** Endoplasmic reticulum stress, type 2 diabetes, vitamin D3



## THE INVESTIGATION OF SERUM PHENYLALANINE LEVELS TREND BASED ON FORMULA INTAKE OR BREASTFEEDING PATTERN: A CROSS-SECTIONAL STUDY OF LESS THAN TWO YEARS OLD PHENYLKETONURIA (PKU) CHILDREN

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**Background and Aim:** Researchers believed that discontinuing breastfeeding after the diagnosis of phenylketonuria in infants was the only effective way to monitor the newborn's intake and accurate measurement for the information of phenylalanine (Phe). The present study aims to investigate the prevalence and duration of breastfeeding, as well as its effect on serum Phe levels in infants with phenylketonuria in Iran.

**Methods:** The present study is a cross-sectional study of 34 phenylketonuria children under two years old between September 2018 and December 2022. Infants were categorized as breastfed and non-breastfed (bottle-fed) based on their feeding method after diagnosis. Data on medical records, demographic information, and anthropometric indices were collected.

**Results:** Of 94 infants managed in our hospital, 34 had complete medical records. Among the all patients 13 (38.2%) continued to be breastfed combined with phenylalanine-free amino acid-based protein substitute, while 21 (61.8%) were bottle-fed. The mean age at diagnosis was  $[22.59 \pm 18.4]$  days. After assessment of the two groups, non-breastfed infants had lower serum Phe levels than breastfed infants [mean 3.76, SD 2.10; range 1-7 mg/dL (0.05-0.38  $\mu\text{mol/L}$ )] and [mean 4.89, SD 3.68; range 2-19 mg/dL (0.11-1.05  $\mu\text{mol/L}$ )], respectively. However, the results showed no statistically significant difference in comparing both groups for serum Phe levels  $t(34) = 118.0$ ,  $P = 0.51$ . Also we found no significant associations in body measurements at birth and final assessment.

**Conclusion:** In conclusion, there were no statistically significant associations between breastfeeding and serum Phe levels with growth in children with phenylketonuria.

**Keywords:** phenylketonuria, metabolic, breastfeeding, children



## **SMOKE SIGNALS: THE EPIGENETIC EFFECTS OF MATERNAL SMOKING ON OFFSPRING DEVELOPMENT**

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**Background and Aim:** Maternal smoking during pregnancy has been linked with numerous adverse health outcomes on fetal development, such as poor language development, reduced cognitive functioning, low birth weight, length, head circumference of the newborn, respiratory problems, and increased risk of birth defects such as cleft lip and palate.

**Methods:** Recent research has also suggested that maternal smoking may have epigenetic effects on the developing fetus, leading to alterations in gene expression that persist throughout the life process. Epigenetic modifications such as alteration in DNA methylation patterns in genes, histone and chromatin modifications, gene expression modulation and non-coding RNA expression have been implicated in these effects. For instance, a study found that maternal smoking during pregnancy was associated with increased DNA methylation in the NR3C1 gene, which is involved in regulating the stress response.

**Results:** Accordingly, these alterations in gene expression may underlie some of the negative health outcomes associated with maternal smoking. Understanding the epigenetic effects of maternal smoking on offspring development could be crucial for developing effective interventions to prevent these negative outcomes and improve the health of future generations.

**Conclusion:** Interventions such as smoking cessation programs for pregnant women may help to reduce the epigenetic effects of maternal smoking on fetal development and increase the long-term health outcomes of offspring.

**Keywords:** pregnancy; smoking; epigenetic; DNA methylation ; gene



## EFFECTIVENESS OF IMPLEMENTATION OF IRAN ECO PROGRAM IN CONTROLLING OVERWEIGHT AND OBESITY IN CHILDREN AND ADOLESCENTS AGED 5-18 YEARS OF AHVAZ UNIVERSITY IN 1397 TO 1401

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**Background and Aim:** Childhood and adolescent obesity has become a health problem. The effects of obesity on health start from a young age and continue until adulthood. The successful implementation of the health reform plan in the field of health and the presence of nutrition experts in comprehensive health centers have provided the opportunity for the Iranian society to benefit from better services. The aim of this study is to determine the effectiveness of the Iran Eco program in controlling overweight and obesity in children and adolescents aged 5 to 18 years in the covered population during the years 1397 to 1401

**Methods:** Children and adolescents aged 5 to 18 years were evaluated, overweight and obese people were identified and they received nutrition services according to the service package of the Ministry of Health, and those in need were referred to nutritionists and doctors for care.

**Results:** In 1397, out of 252,197 children and adolescents cared for, 52,406 people (20.78%) were identified as overweight and obese, and in 1401, out of 300,624 children and adolescents cared for, 50,837 people (16.91%) were identified as overweight and obese.

**Conclusion:** This survey shows the effectiveness of the Iran Eco program in children and adolescents aged 5 to 18 years. Strengthening this program, including nutrition counseling, teaching healthy eating patterns and correcting inappropriate eating habits, doing enough physical activity and playing more active games instead of playing with computers, tablets and phones will reduce overweight and obesity in children and teenagers

**Keywords:** Iran Eco, obesity, overweight, adolescent, education



## COMPARISON OF THE EFFECT OF THE IMPLEMENTATION OF THE NUTRITIONAL SUPPORT PROGRAM FOR PREGNANT MOTHERS OF MALNOURISHED FAMILIES IN NEED ON THE WEIGHT OF BABIES OF MOTHERS COVERED BY THE PROGRAM OF AHVAZ UNIVERSITY OF MEDICAL SCIENCES DURING THE YEARS 1399-1401

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**Background and Aim:** Reports in the country indicate that malnutrition among needy pregnant mothers is a major problem. One of the effective factors in the optimal weight gain of babies is access to food during pregnancy. In this study, the impact of the nutritional support program on the weight gain of the babies of mothers covered by the support program and the comparison of this program during the years 1399-1401 have been done.

**Methods:** In this project, which was implemented with the participation of the Imam Khomeini Relief Committee, 2500 malnourished and needy pregnant mothers in the cities covered by Ahvaz University were identified and introduced to the relief committee and received 12 monthly food baskets.

**Results:** During two stages of monitoring in each year, during the years 1399-1401, it was found that 4.1% of babies born to covered mothers in 1399, 4.2% of cases born in 1400 and 4.6% of these babies in 1401 had a weight of less than 2500 grams .

**Conclusion:** Considering that the LBW index was 5.1% in 1401 for pregnant mothers covered by this university, the effectiveness of the support program for pregnant mothers in need, who are a higher risk group, is clear, But since the mentioned index has decreased in covered mothers in 3 years, And due to the increase in the price of food items, it is necessary to increase the monthly per capita for each mother, increase the number of covered mothers and continuous education in needy families.

**Keywords:** Nutritional support program ,babies born, LBW





## FROM TRADITIONAL MANAGEMENT TO COLLABORATIVE GOVERNANCE: IMPLICATIONS FROM GOVERNANCE STUDIES FOR BETTER POLICY MAKING IN NUTRITION AND FOOD

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**Background and Aim:** The knowledge of governance is considered a new approach in the management of society's issues. The amount of knowledge produced in this field promises new horizons in solving some of the problems that more traditional approaches have been unable to solve. Among the new approaches in this field is Collaborative Governance, which has been agreed upon by a large number of experts in various fields. This research is trying to introduce the field of collaborative governance and its potential capacities to promote policies in the field of food and nutrition.

**Methods:** By using library studies and conducting comparative studies, this research provides indications and guidelines for more effective policies of forces, resources, and structure in the field of food industry and nutrition. In this way, researchers use targeted interviews in order to achieve the research goals.

**Results:** The results of this research contain guidelines for rearranging forces and resources and adopting policies for the food and nutrition policy system by using the knowledge capacities of the governance field.

**Conclusion:** A review of scholarly studies and experiences shows that this field has implications for the field of nutrition and food that can help nutritional justice and the realization of the goals and policies of the nutrition system and food access.

**Keywords:** Governance, Collaborative Governance, Public Policymaking, Nutrition, Food, Justice



## EFFECT OF AEROBIC TRAINING AND POMEGRANATE PEEL EXTRACT (PPE) SUPPLEMENTATION ON INTERLEUKIN 10 (IL-10) AND TUMOR NECROSIS FACTOR-ALPHA (TNF- $\alpha$ ) LIVER TISSUE IN FEMALE OBESE RATS

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**Background and Aim:** evaluate the effect of 6 weeks of aerobic exercise with pomegranate peel extract on IL-10 and TNF- $\alpha$  gene expression in obese female rats

**Methods:** 30 obese female mice were divided into 5 groups of 6. The training program will be done for 4 weeks and with moderate intensity. The supplement is pomegranate peel extract which was applied by gavage at a dose of 60 mg per kg of rat body weight for 4 weeks and 5 times a week. 48 hours after the end of liver tissue intervention, the mice were biopsied to measure IL-10 and TNF- $\alpha$  gene expression

**Results:** The results showed: no significant difference in the expression of TNF- $\alpha$  ( $p = 0.443$ ) and IL-10 ( $p = 0.513$ ) gene between healthy and obese control groups, supplementation of pomegranate peel extract had a significant effect on TNF- $\alpha$  gene expression ( $F = 0.287, sig = 0.010, F = 8.052$ ), aerobic exercise ( $F = 0.032, sig = 0.425, F = 0.662$ ), and the interaction of aerobic exercise and pomegranate peel extract supplement ( $F = 0.019, sig = 0.543, F = 0.383$ ) has no significant effect on TNF- $\alpha$  gene expression. Benferoni test showed that the expression of TNF- $\alpha$  gene at the end of the period was significantly lower in the group receiving pomegranate peel extract supplement than the control group ( $P = 0.010$ ). The results also showed that aerobic exercise ( $F = 0.395, sig = 0.036, F = 0.754$ ), pomegranate peel extract supplement ( $F = 0.042, sig = 0.358, F = 0.886$ ) The interaction of aerobic exercise and pomegranate peel extract supplementation ( $F = 0.0001, sig = 0.999, F = 0.0001$ ) had no significant effect on IL10 gene expression

**Conclusion:** the combination of aerobic exercise and supplementation with pomegranate peel did not have a significant effect on systemic inflammatory factors and anti-inflammatory factor, but despite these improvements were observed

**Keywords:** Obesity, Inflammation, Endurance Training, pomegranate



## COMPARISON OF SOY PROTEIN AND ANIMAL PROTEINS IN MUSCLE MASS AND STRENGTH IN RESPONSE TO RESISTANCE EXERCISE: A SYSTEMATIC REVIEW

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**Background and Aim:** Resistance exercise is a well-known method of increasing muscle mass and strength. Soy protein is a plant-based protein source that has been suggested to have benefits for muscle growth, but it is unclear how it compares to animal-based proteins. The objective of this systematic review is to compare the effects of soy protein and animal proteins on muscle mass and strength in response to resistance exercise.

**Methods:** This review study was conducted through an advanced search of reputable scientific databases. The outcomes of interest will include changes in lean body mass (LBM) and strength in response to resistance exercise training (RET). The initial search yielded a total of 103 articles. After screening titles and abstracts for relevance, 38 articles were selected for full-text review. Among the selected articles, 9 studies with 266 participants met the inclusion criteria and were included in the final analysis.

**Results:** Nine studies compared soy protein versus all other proteins (whey, beef, and dairy). There were significant increases in both strength and LBM in each subgroup as a result of the interventions. None of the subgroup comparisons resulted in significant differences between the soy and the other proteins groups. These between-subgroup comparisons were bench press, squat and LBM.

**Conclusion:** There does not appear to be a significant difference between the soy protein and animal proteins sources in terms of their effects on LBM or strength. Therefore, a mix of soy and dairy protein might actually increase strength and LBM.

**Keywords:** Resistance exercise, Muscle mass, Muscle strength, Soy protein, Animal protein



## INVESTIGATING THE EFFECT OF KETOGENIC DIET ON BODY FAT PERCENTAGE IN PROFESSIONAL RESISTANCE ATHLETES: A SYSTEMATIC REVIEW

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**Background and Aim:** The ketogenic diet (KD) is a high-fat, low-carbohydrate diet that has gained popularity due to its potential benefits for weight loss and improved metabolic health. However, the effect of KD on body fat percentage (BFP) in professional resistance athletes is not well established. This systematic review was conducted to investigate the effect of KD on BFP in professional resistance athletes.

**Methods:** A comprehensive search of electronic databases including PubMed, Scopus, Web of Science and Google Scholar search engine was performed to identify relevant studies published between 2010 and 2023. Randomized controlled trials (RCTs) were included in this review. The initial search yielded a total of 318 articles. After screening titles and abstracts for relevance, 65 articles were selected for full-text review. Among the selected articles, 5 studies with 128 participants met the inclusion criteria and were included in the final analysis.

**Results:** Three studies reported a significant decrease in BFP in professional resistance athletes following KD intervention, while two studies reported no significant change in BFP. The duration of KD intervention varied from 4 to 12 weeks, and the percentage of calories from fat ranged from 60% to 90%.

**Conclusion:** While the current evidence suggests that KD may be an effective dietary strategy for reducing BFP in professional resistance athletes, more research is needed to determine the safety and long-term effects of the KD on body composition and health outcomes before it can be recommended as a routine dietary strategy for professional athletes.

**Keywords:** Ketogenic diet, Resistance athletes, Body fat percentage, High fat, Low carbohydrate intake



## INVESTIGATING THE EFFECT OF 8 WEEKS OF MODERATE RESISTANCE TRAINING AND LACTOBACILLUS REUTERI PROBIOTIC ON ATF4 & ATF6 GENE EXPRESSION IN THE MUSCLE TISSUE OF RATS WITH NON-ALCOHOLIC FATTY LIVER DISEASE

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**Background and Aim:** ATF4 & ATF6 encodes a transcription factor that is anchored in the endoplasmic reticulum and activated to protect cells from endoplasmic reticulum stress (ERS). ERS affects many tissues and contributes to the development and severity of chronic diseases such as NAFLD. In several studies, it was shown that probiotics increases with exercise and subsequently has a positive effect on the recovery of NAFLD. Long-term and exhausting exercise reduces ATF4 & ATF6 in liver and muscle tissue. So, the purpose of the present study was to investigate the effect of 8 weeks of MRT and probiotic supplementation on ATF4 & ATF6 gene expression in the muscle tissue of rats with NAFLD.

**Methods:** This research was conducted on 32 male Wistar rats (8-10 weeks, 230-300 grams) that randomly divided into 4groups: control, supplement, exercise, supplement+exercise. ATF4 & ATF6 gene expression of muscle cells was measured by Real time-PCR method.

**Results:** The fold change of ATF4 gene expression in the muscle tissue of male Wistar rats was different among 4groups( $P=0.031$ ). It was observed gene expression in the muscle tissue was significantly lower in the supplement+exercise group compared to the supplement group( $P=0.030$ ). However, there was no difference in the expression of ATF6 gene among 4groups.

**Conclusion:** The results of this study showed that a combination of probiotic and MRT decreased ATF4 gene expression in in the muscle tissue of Wistar rats, which may reduce inflammation and apoptosis caused by ERS and thus prevent the progression of NAFLD.

**Keywords:** moderate resistance training (MRT), Lactobacillus Reuteri probiotic, activating transcription factor 4 (ATF4), activating transcription factor 6 (ATF6), non-alcoholic fatty liver disease (NAFLD)



## EVALUATION OF HEAVY METALS CD,CR, HG,NI,AS,AND PB CONCENTRATION IN SALT SAMPLES OF LAKE URMIA,IRAN

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**Background and Aim:** Heavy metals are one of the environmental pollutants that human exposure to them can cause chronic disease. Nowadays, the pollution caused by heavy metals is considered as a worldwide environmental and food safety concern. Salt is one of the oldest and widely utilised food additives in human history. There for, the evaluation of heavy metals residues in various food samples and food additives like salt is of great importance.

**Methods:** In this study, 30 salt samples were collected from 30 different locations of Lake Urmia and analyzed with inductively coupled plasma-atomic emission spectroscopy.

**Results:** The maximum concentration of Cd,Cr,Hg,Ni,As and Pb in the evaluated salt samples were 40,541,261,464,38 and 254 ng g<sup>-1</sup>.

**Conclusion:** The obtained results indicated that the concentration of studied metals in the salt samples were less than the permitted maximum for human consumption except for two cases. In one sample, the concentration of Cr and in another sample, the concentration of Hg exceeded the maximum levels set by Codex and the Iranian food standards.

**Keywords:** Heavy metals;dithizone;salt;diethyldithiocarbamate;Lake Urmia



## COMPARISON OF SELF-ADMINISTERED WEB-BASED (NUTRIPORS) AND PRINTED FOOD FREQUENCY QUESTIONNAIRES FOR DIETARY ASSESSMENT IN THE IRANIAN ADULT POPULATION

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**Background and Aim:** Today, with the increasing availability and usage of the internet, dietary assessment tools including FFQ are designed and modified using web technology. The web-based Nutripors food frequency questionnaire (FFQ) was developed as a dietary assessment tool for healthy adults in Iran. The present study aimed to develop a web-based FFQ for the Iranian adult population to assess dietary intakes and compare it with the validated printed FFQ.

**Methods:** Eligible participants were randomly asked to complete both the printed FFQ and Web-Based FFQ (<https://nutripors.ir/>). The type of FFQ was changed for each participant after ten days. The level of agreement between two FFQs was evaluated using the Bland and Altman method and correlations.

**Results:** Out of 190 participants, the final analysis was performed on 141 participants. The results are from the dietary assessment of 70 females (49.6%) and 71 males (50.4%) that completed both FFQs. The level of agreement was high for all nutrient intakes ( $r > 0.8$ ). In food groups, "Whole grains" has the highest (0.84), and "Potato" has the lowest (0.25) correlation coefficients. Also, there were no significant differences in the time spent to complete the questionnaires.

**Conclusion:** We concluded that Web-Based FFQ as an online FFQ has good agreement with the validated printed FFQ and properly reflects the nutrient and food group intakes.

**Keywords:** dietary assessment, epidemiology, nutrition, public health, food frequency questionnaire, nutrients



## WHAT ARE THE UNDERSTANDING AND REASONS BEHIND SAUSAGE CONSUMPTION AMONG IRANIAN CONSUMERS?

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**Background and Aim:** Meat products, such as sausages, have been manufactured and supplied in Iran for several years. A change in consumer food preferences, particularly among the younger generation, has resulted in a significant rise in the demand for these items. Sausages have now become a typical component of some people's diets. The lack of information on consumers' opinions about sausages in the country prompted the study to investigate consumers' perceptions and reasons for consuming these products among adults in Tehran.

**Methods:** The study executed a qualitative approach to investigate the statistical population consisting of adults aged 18 to 60 living in Tehran. Semi-structured face-to-face interviews were chosen as a method to collect qualitative data. A total of 43 individuals, comprising 25 females and 18 males, were selected via purposeful sampling using a maximum diversity technique. MAXQDA2020 software was employed for qualitative content analysis. The quantitative findings revealed that approximately 50% of the participants rarely included sausages in their diet, and almost 12% of them never consumed these products. Based on the qualitative findings, the primary reasons for consuming sausages were taste, children's preference, easy preparation, cheapness and variety. Participants also highlighted production and expiration dates, brand and meat percentage as crucial factors in their purchasing decisions. Their lack of trust in nutritional information on food labels, especially regarding product ingredients, prompted them to disregard it. The majority of participants, including those who consumed sausages, perceived sausages as unhealthy and unsafe products due to a number of factors such as poor quality of raw materials, fraudulent production, harmful additives such as nitrates, and high levels of fat and salt. Furthermore, they believed that sausages have the potential to cause a range of illnesses, such as heart disease, high blood pressure and cancer, which contributed to negative attitudes towards these products. In the current study, participants expressed a





lack of trust not only towards manufacturers but also towards regulatory institutions and their performance.

**Conclusion:** The results of this study indicate that despite holding a negative perception and attitude towards sausages, participants still consume these products. It seems that the inclusion of sausages in the list of products harmful to health by the government is not sufficient to discourage the consumption of these products. Therefore, given the general consumption of these products, it may be advisable to incentivize and support manufacturers in adopting innovative manufacturing techniques to produce and supply healthy, high quality and safe products.

**Keywords:** Perception; Attitude; Consumers; Meat products; Qualitative study



## IS MEAT CONSUMPTION ASSOCIATED WITH POLYCYSTIC OVARY SYNDROME (PCOS) IN IRANIAN WOMEN?

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**Background and Aim:** Polycystic ovary syndrome (PCOS) is the most prevalent cause of ovulatory infertility and endocrine abnormalities in reproductive-age women. The present study was conducted to investigate the association between meat consumption and polycystic ovary syndrome (PCOS) in Iranian women

**Methods:** This case-control study containing 108 newly diagnosed PCOS women and 108 age, and body mass index matched women without PCOS, as a control group, in Yazd, Iran. The validated 168-item food frequency questionnaire was used to assess the usual dietary intake. Logistic regression was used to estimate the association between meat consumption and PCOS

**Results:** The findings of this study showed, the individuals in the third tertile of red meat intake, had higher odds for PCOS in the crude model (OR= 4.29; 95% CI, 2.13-8.64; P-value = 0.001) compared with those in the first tertile. These results remained significant after adjustments for energy intake, marital status, physical activity, education, pregnancy history, chronic disease history and medication use (OR= 3.78; 95% CI, 1.78-8.40; P-value=0.001). Higher consumption of red meat increased the risk of PCOS by 3.78 times. Furthermore, higher consumption of processed meats increased the risk of PCOS by 2.15 times (OR= 2.15; 95% CI, 1.05-4.39; P-value and trend = 0.035). We did not find an association between other types of meat consumption and PCOS

**Conclusion:** Although the results of the present study showed that higher consumption of red and processed meat increased the risk of PCOS, more studies are needed to confirm these findings in the future

**Keywords:** PCOS, Meat, fish



## ASSOCIATIONS OF DIFFERENT TYPES OF DAIRY PRODUCTS AND THE RISK OF DEPRESSION, ANXIETY, AND STRESS SYMPTOMS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF OBSERVATIONAL STUDIES

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**Background and Aim:** Since the findings of previous research on the association between dairy consumption and mental health outcomes are very inconsistent, the present meta-analysis was conducted with the aim of a comprehensive review of studies on the association between dairy consumption and mental disorders (depression, anxiety, and stress)

**Methods:** Literature research was conducted by searching PubMed, Web of Science, Scopus, and Google Scholar databases. The random-effects model was used to pool odds ratios with 95% confidence intervals. Overall, 18 studies met the inclusion criteria and were included in the present meta-analysis. Dairy products include high-fat dairy, low-fat dairy, milk, cheese, and yogurt intake

**Results:** The findings of the present meta-analysis indicated that dairy consumption significantly decreased the odds of anxiety (OR= 0.74, 95 % CI, 0.66-0.83;  $p < 0.001$ ). Another analysis on milk consumption and anxiety reported similar findings (OR= 0.79, 95 % CI, 0.70-0.89;  $p < 0.001$ ,  $I^2 = 48.75$ ,  $P = 0.11$ ). In addition, dairy consumption significantly reduced the odds of stress (OR= 0.72, 95 % CI, 0.62-0.85;  $p < 0.001$ ) and depression (OR= 0.88, 95 % CI 0.78-0.98;  $P = 0.03$ ). The results of subgroup analyses on the depression also showed that dairy consumption could decrease the odds of depression in the West Asian population (OR= 0.77, 95 % CI 0.66-0.90;  $P < 0.001$ ,  $I^2 = 52.90$ ,  $P = 0.03$ ) and in cross-sectional studies (OR= 0.88, 95 % CI 0.78-0.99;  $P = 0.03$ ,  $I^2 = 72.62$ ,  $P < 0.001$ ).

**Conclusion:** Generally, the results showed a significant inverse association between dairy consumption and the risk of depression, anxiety, and stress

**Keywords:** depression, anxiety, stress, dairy



## DOES AN UNHEALTHY PLANT-BASED DIET (UPDI) INCREASE THE RISK OF COVID-19?

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**Background and Aim:** The fast spread of the coronavirus disease 2019 (COVID-19) epidemic and its high mortality were quickly considered by the health community. Since, dietary patterns play an important role in strengthening or weakening the immune system and thus incidence of the disease, the present study was conducted to provide a comprehensive picture of the associations between unhealthy plant-based diet index (uPDI) and COVID-19 incidence.

**Methods:** This study was undertaken on 8157 adults' participants of the Yazd Health Study (YaHS) and Taghzieh Mardom-e-Yazd (TAMIZ) study aged 20 to 70 years. Data on dietary intakes were obtained using a validated food frequency questionnaire (FFQ). Multivariable logistic regression analysis was used to assess the association between uPDI and COVID-19.

**Results:** A significant association between uPDI and the risk of COVID-19 was observed (OR: 1.36; 95% CI: 1.05–1.75) in the crude model. After adjusting potential confounders, a significant increasing trend in the odds of COVID-19 across increasing quintiles of uPDI (OR: 1.58; 95% CI: 1.05–2.37; P for trend: 0.027) was observed. Stratified analysis based on sex indicated that uPDI significantly increased the risk of COVID-19 only in males (OR: 1.73; 95% CI: 1.12–2.67; P for trend: 0.012) and had no effect on females.

**Conclusion:** Participants in the highest quintiles of the uPDI had 58 % higher odds of COVID-19 compared to subjects in the lowest quintile of uPDI. Although our study has promising results, stronger clinical studies are needed.

**Keywords:** PDI, uPDI, COVID-19, SARS-CoV-2



## IS THERE AN ASSOCIATION BETWEEN THE DIETARY ACID LOAD AND COVID-19?

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**Background and Aim:** Based on the prior articles, the possible role of acid-base balance and dietary acid load in COVID-19 has been suggested; however, evidence on this association is limited and warrants further consideration. The present study can provide a comprehensive picture of the associations between dietary acid load (DAL) & and COVID-19 incidence

**Methods:** This cross-sectional study was undertaken on 9189 adults' participants of the Yazd Health Study (YaHS) and Taghzieh Mardom-e-Yazd (TAMIZ) study aged 20 to 70 years. Data on dietary intakes were obtained using a validated food frequency questionnaire (FFQ). Multivariable logistic regression analysis was used to assess the association between DAL and COVID-19.

**Results:** Using the net endogenous acid production (NEAP) criterion as a predictor of dietary acid load, we found that individuals in the highest quintile of the dietary acid load had 65% higher odds of COVID-19 than those in the lowest quintile after adjusting confounders (OR: 1.65 CI: 1.02– 2.66). However, the relationship between the NEAP index and the odds of COVID-19 was not linear (P-trend=0.14). Furthermore, the potential renal acid load (PRAL) index was not significantly associated with the odds of COVID-19 (OR: 1.30, CI: 0.81– 2.10, p- trend =0.35).

**Conclusion:** In the present study, the dietary acid load was directly related to the higher odds of COVID-19. More detailed clinical studies are needed to confirm the above result.

**Keywords:** Dietary acid load, DAL, acid load, COVID-19



## CORRELATION OF DIETARY PROTEIN INTAKE WITH BODY COMPOSITION AND PHYSICAL STATUS IN PATIENTS WITH KNEE OSTEOARTHRITIS

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**Background and Aim:** Osteoarthritis (OA) is the most common type of arthritis in humans, which is increasing in developed and developing countries by changing lifestyles and obesity as well as the rise of the aged population. Caregivers and patients have queries regarding nutritional necessities and dietary supplements in clinical practice. Considering the high interest, few studies have focused on dietary intake in patients with knee OA. The objective of this study was to examine the correlation between dietary protein intake and the indicators of body composition, pain, and functional status in patients with knee OA.

**Methods:** This cross-sectional descriptive study was performed on the target population including all patients with knee OA in the health centers of Tabriz University of Medical Sciences. The data collection period was one year between October 2017 and October 2018. The cluster sampling method was used. The standard, 168-item modified semi-quantitative FFQ has been used in another study and confirmed for validity and reliability in the Iranian population. Animal-based protein intake was estimated by summing up the protein content of red meat, poultry, dairy products, eggs, processed meat, and fish. Plant-based protein intake was measured by summing up the protein contents of grain, legumes, and nuts. Bioelectrical impedance was measured using the InBody270 scale, with participants standing without shoes on the analyser's footpads, and holding its handles, lean body mass (LBM), the mass of body fat (MBF), and soft lean mass (SLM) were measured. Western Ontario and McMaster Index (WOMAC) is one of the most commonly used instruments to measure the functional status and pain associated with OA in the lower extremities. This index has three subscales: WOMAC pain (5 items), WOMAC physical function (17 items), and WOMAC stiffness (2 items) consisting of 24 questions. The visual Analogue Scale (VAS) is a tool for measuring pain severity in patients with OA. In this study, 310 patients with knee OA were evaluated. Forty-three patients refuse to participate in the study. Forty-seven patients didn't meet the eligibility criteria. The total adjusted protein intake in the participant was  $55.36 \pm 24.14$  grams ( $0.70 \pm 0.31$  grams per kg weight) per day, of which  $14.96 \pm 16.45$  grams ( $19.37 \pm 27.62\%$ ) was plant protein. One hundred and fifty-four participants (70 %) didn't meet the RDA for protein intake, of which 100 patients (45.4%) didn't meet the 75 % of RDA for protein intake. Men consumed more protein than women ( $69.70 \pm 27.12$  vs.  $49.11 \pm 19.72$  g / day,  $p < 0.001$ ).



However, the dietary animal based/plant-based protein ratio was significantly higher in women than in men ( $p=0.007$ ). There was a negative and significant association between the total adjusted dietary protein and adjusted animal-based protein intake with pain severity. In the subset of participants whose protein intakes were lower than 75 percent of RDA, there were negative and significant correlations between the total adjusted dietary protein and adjusted animal-based protein intakes with pain severity. Additionally, there were negative and significant correlations between the adjusted total protein intakes, and adjusted animal-based protein intakes, and WOMAC total score ( $p=0.006$  and  $p=0.010$ , respectively), WOMAC pain score ( $p=0.008$ ,  $p=0.013$ , respectively), and WOMAC stiffness score ( $p=0.003$  and  $p=0.004$ , respectively). In these patients, there were also negative and significant correlations between total adjusted dietary protein, plant-based protein, and animal-based protein intakes with WOMAC functional scores ( $p=0.004$ ,  $p=0.006$ , and  $p=0.011$ , respectively). Pain severity correlated positively with MBF ( $p=0.001$ ) and negatively with SLM ( $p=0.032$ ) and LBM ( $p=0.014$ ). MBF also correlated positively with WOMAC total and WOMAC pain scores ( $p=0.039$  and  $p=0.004$ , respectively). Additionally, lower LBM correlated significantly with higher WOMAC stiffness scores in patients ( $p=0.047$ ).

**Conclusion:** The results of this study propose that most participants with knee OA had a dietary protein intake lower than the current RDA. Patients with higher dietary total and animal-based protein intakes had lower pain severity. In patients with protein intakes lower than 75 percent of RDA, higher dietary total and animal-based protein correlated with lower physical disabilities. MBF correlated positively, and SLM and LBM correlated negatively with pain severity in the patients. The patients with higher MBF and lower LBM had higher physical dysfunction according to the various subscales of the WOMAC index.

**Keywords:** Body composition, Dietary protein, Functional status, Knee osteoarthritis, Pain



## THE EFFECT OF GINGER (*ZINGIBER OFFICINALE ROSCOE*) AND TURMERIC (*CURCUMA LONGA*) SUPPLEMENTATION ON QUALITY OF LIFE AND BODY COMPOSITION IN POSTMENOPAUSAL WOMEN

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**Background and Aim:** Menopause is considered a very important period in women's lives, particularly due to its effects on physical, and emotional well-being. We aimed to determine the effects of *Zingiber officinale Roscoe* (ZO) and *Curcuma longa* (CL) supplementation on 17- $\beta$  estradiol (ES) levels, lipid profile, glycemic indices, menopause-related quality of life (MENQOL) and body composition indices in postmenopausal women.

**Methods:** In this four-month triple-blind randomized controlled trial, 120 postmenopausal women were recruited via a non-random convenience sampling method from the Tabriz health centers between 2018 and 2019. Participants were randomly allocated to one of four groups to receive: ZO tablet 1000 mg and CL placebo, CL tablet 1000 mg and ZO placebo, both ZO tablet 1000 mg and CL tablet 1000 mg, and ZO placebo and CL placebo. The primary outcome of this trial was the 17- $\beta$  estradiol (ES) level. Secondary outcomes included MENQOL and body composition indices. One hundred and fifteen participants completed the study. GP [mean change (MC) = 3.18 (95% CI: 0.55 to 5.81)] resulted in significantly greater increase in serum ES compared to PP after 4 months. GP [MC = -1.15 (95% CI: -2.89 to -0.60)] and TP [MC = -0.67 (95% CI: -1.14 to -0.09)] resulted in significantly greater improvements in total MENQOL compared to PP [MC = -0.25 (95% CI: -1.02 to 0.44)] after 2 months. GP [MC = -1.26 (95% CI: -2.78 to -0.72)], TP [MC = -1.21 (95% CI: -2.79 to -0.53)] and GT [MC = -1.69 (95% CI: -2.48 to -0.85)] resulted in significantly greater improvements in total MENQOL compared to PP [MC = -0.51 (95% CI: -0.04 to 1.32)] after 4 months. A significant group difference favoring the GP group compared to the PP was detected for the vasomotor symptoms [MC = -1.03 (95% CI: -2.57 to -0.97)]. All groups showed a non-significant reduction in mass of body fat, with no significant statistical differences between the groups.

**Conclusion:** This study suggests the beneficial effects of ginger, turmeric, and ginger plus turmeric supplementation on the quality of life in PMO women.

**Keywords:** body composition; ginger; menopause; quality of life; turmeric





## A SYSTEMATIC REVIEW OF THE EFFECTS OF PROBIOTICS ON THE OUTCOMES OF ASSISTED REPRODUCTIVE TECHNOLOGIES

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**Background and Aim:** The objective of this study was to examine the impact of probiotics on the outcomes of assisted reproductive technologies, which are technologies that aid in fertility treatments.

**Methods:** To conduct this study, a systematic review was conducted by searching various databases including MEDLINE, Allied Health Literature, EMBASE, Scopus, ISI, and The Cochrane database. The inclusion criteria for article selection were based on randomized clinical trials. From the articles available, five were selected for analysis.

**Results:** In summary, the five selected articles examined the effects of probiotics on fertility outcomes in women undergoing in vitro fertilization (IVF) or intrauterine insemination (IUI) cycles. The first article found no improvement in pregnancy rates in IVF cycles when probiotics were used after oocyte retrieval. The second article suggested that assessing the microbial status of the endometrium may be helpful, but it did not significantly improve pregnancy outcomes. The third article showed that a probiotic improved sperm quality in males with oligoasthenoteratospermia, a condition characterized by low sperm count, poor sperm motility, and abnormal sperm shape. The fourth article indicated that antioxidant probiotics improved sperm motility and reduced DNA fragmentation in asthenozoospermic males, who have reduced sperm motility. The fifth article found a slight increase in pregnancy rates with probiotic suppositories in IUI cycles, but the difference was not statistically significant.

**Conclusion:** In conclusion, while some studies suggest potential benefits of probiotics in fertility outcomes, the overall evidence remains inconclusive. Further research is necessary to fully understand the specific effects and benefits of probiotics in reproductive medicine.

**Keywords:** probiotics, infertility, assisted reproductive technologies, IVF, IUI



## ASSESSMENT OF THE EFFECT OF SAFFRON SUPPLEMENTATION ON BLOOD GLYCEMIC INDICATORS IN DIABETIC PATIENTS

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**Background and Aim:** Diabetes mellitus (DM) is known as one the most prevalent endocrine disorders. Currently, the only way to control and treat DM is controlling the level of blood sugar. Recently, using herbal ingrediants for betterment of DM is receiving more attention. Saffron is a plant which due to containing antioxidants and polyphenol compounds, seems to have beneficial effects on health. The most important therapeutic effects of saffron are attributed to the compounds, which include: crocin, picrocrocin, crocetin, safranal. 76% of the annual provision of saffron in the world is related to Iran. The purpose of this review was to evaluate the evidence which studies the effect of saffron on blood glyceimic indicators in diabetic patients.

**Methods:** In this study we used databases such as Pubmed and SCOPUS . Articles were searched from the beginning to May 2023. In this present review, we intromited six articles of the eligible human, RCT studies which examined the effect of saffron on glyceimic indicators on diabetic patients, and we discussed the preventive mechanism of saffron to control inflammation caused by diabetes and blood sugar level.

**Results:** In all six articles, saffron supplementation caused a significant reduction ( $p_{value} < 0.05$ ) in fasting blood sugar level in diabetic patients.

**Conclusion:** By regarding the studies, it can be concluded that saffron, can have a potential effect on the body's glyceimic indicators in diabetic patients. However, in order to utilization of this plant, more investigations in other different conditions is needed.

**Keywords:** Diabetes, saffron, glyceimic index



## DIET QUALITY INDICES ARE ASSOCIATED WITH SLEEP AND MENTAL HEALTH STATUS AMONG DIABETIC WOMEN: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Diabetes is a common chronic disease with many complications. Diet is an environmental factor that has a well-known and important role in health status, diabetes improvement and reduction of its complication. This study was conducted to investigate the association between diet quality indices and sleep, stress, anxiety, and depression among diabetic women.

**Methods:** This cross-sectional study was conducted on 230 Tehrani women with type 2 diabetes. A validated and reliable food frequency questionnaire was filled to assess the dietary intake and adherence to the diet quality indices (HEI and DQI). Pittsburgh Sleep Quality Index and 21 items Depression, Anxiety, and Stress Scale were used to assess the sleep and mental disorders, respectively.

**Results:** Patients who were in the top tertile of diet quality index consumed less fat, saturated mono-and poly-unsaturated fatty acids, and sodium ( $P < 0.05$ ). Participants who were in top tertile of diet quality indices consumed more fruits, and vegetables. Patients in the highest tertile of diet quality index-international had less risk of depression (OR: 0.17; 95% CI: 0.07; 0.41), anxiety (OR: 0.36; 95% CI: 0.16; 0.80), stress (OR: 0.09; 95% CI: 0.04; 0.21), and poor sleep (OR: 0.12; 95% CI: 0.04; 0.36). Patients in the highest tertile of healthy eating index-international had less risk of depression (OR:0.06;95%CI:0.02;0.21), anxiety (OR:0.10; 95%CI:0.04;0.26), stress (OR:0.11; 95%CI:0.05;0.26), and poor sleep (OR:0.08; 95%CI:0.03;0.20).

**Conclusion:** It seems that greater adherence to a high-quality diet can reduce the risk of these complications. Prospective cohort studies with a larger sample size of both genders are needed to prove our findings.

**Keywords:** Anxiety; Depression; Diabetic patients; Diet quality index; Healthy eating index; Sleep



## DIETARY TOTAL ANTIOXIDANT CAPACITY AND ITS ASSOCIATION WITH SLEEP, STRESS, ANXIETY, AND DEPRESSION SCORE: A CROSS-SECTIONAL STUDY AMONG DIABETIC WOMEN

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**Background and Aim:** Diabetes as a common chronic disease leads to several serious disabilities and complications. Patients with diabetes are involved with psychological and sleep disorders which diet can be effective in the management of these problems. Diet is a modifiable environmental factor which has a well-known and important role in health status. The present study aimed to investigate the association of Dietary Total Antioxidant Capacity (DTAC) and sleep, stress, anxiety, and depression among diabetic women.

**Methods:** This cross-sectional study conducted on 265 women with type 2 diabetes. A validated food frequency questionnaire was filled to evaluate dietary intakes. We calculated DTAC based on amounts of antioxidant in each dietary item using the ferric reducing ability of plasma (FRAP) and oxygen radical absorbance capacity (ORAC) databases. Pittsburgh Sleep Quality Index was used to assess sleep quality. Moreover, 21 items Depression, Anxiety, and Stress Scale was used to assess mental disorders.

**Results:** The odds of depression were negatively related to the highest tertile of FRAP and ORAC score (OR: 0.21, 95%CI: 0.09-0.50 and OR: 0.21, 95%CI: 0.10-0.48, respectively). Participants with the highest tertile of FRAP compared to those within the lowest tertile of FRAP score had a 59% lower risk of anxiety. The odds of stress were negatively related to the highest tertile of FRAP and ORAC score (OR: 0.10, 95%CI: 0.04-0.23 and OR: 0.13, 95%CI: 0.06-0.29, respectively).

**Conclusion:** There is a significant association between DTAC, sleep status and psychological disorders. However, prospective studies in both genders should be conducted to confirm the actual relationship.

**Keywords:** Depression; Diabetic patients; Dietary total antioxidant capacity; Sleep; Women



## ASSOCIATION BETWEEN A LOW-CARBOHYDRATE DIET AND SLEEP STATUS, DEPRESSION, ANXIETY, AND STRESS SCORE

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**Background and Aim:** Dietary intakes, especially carbohydrates, play an important role in blood glucose control in patients with diabetes. It is suggested that carbohydrate amounts may be effective in diabetes complications. Dietary carbohydrates play an important role in blood glucose control and controlling the development of diabetes and its complications. Therefore, a low carbohydrate diet (LCD) as an effective program to manage diabetes has been developed. Previous studies have shown that LCD can improve insulin sensitivity, and reduce body fat, weight, blood glucose, cholesterol, triglyceride, HbA1c, and fasting insulin among patients with diabetes. Moreover, LCD patterns have been associated with reduced risk of some chronic diseases such as coronary heart disease, metabolic syndrome, and cancers as well as diabetes. Based on the previous study, sleep deprivation was associated with energy-dense foods. As our best knowledge, there is no study about the association of LCD score and sleep status and mental disorders among patients with type 2 diabetes. Regarding the traditional dietary pattern in Iran, large amounts of carbohydrates containing refined grains especially rice, bread, and potato are consumed among the Iranian population. This study aimed to reveal the association of low-carbohydrate diet (LCD) and sleep and mental status among patients with diabetes.

**Methods:** Methods: This cross-sectional study was conducted among 265 women with type 2 diabetes. Anthropometric measures, as well as biochemical tests, were recorded. Dietary intakes were recorded using a validated food-frequency-questionnaire to calculate LCD score. To assess mental disorders and sleep quality, the Depression, Anxiety and Stress Scale and the Pittsburgh Sleep Quality Index were used respectively. Results: Patients in the highest LCD quartile were the ones with the lowest carbohydrate consumption. There was no significant association between cardiovascular risk factors and LCD score even after controlling confounder variables ( $P > 0.05$ ). Subjects in the highest quartile of LCD score compared with those within the lowest quartile had a 69% lower risk of poor sleep after adjusting confounders. The odds of depressive symptoms were negatively related to the highest quartile of LCD score in the crude model and even after full-adjusted model (odds ratio: 0.42; 95% confidence interval: 0.17-1.01). Participants in the highest



quartile of LCD score compared with those in the lowest quartile had a 73% lower risk of anxiety.

**Conclusion:** This is the first time which LCD were investigated to sleep status and psychological health among patients with type 2 diabetes. Moreover, diabetic women were selected randomly from different socioeconomic status, therefore, this study could be a representative sample of diabetic women in Tehran province, Iran. Although, besides these strengths, this study has some limitations. Cross-sectional nature of the study cannot reveal the causal association. Use of semi-quantitative FFQ which has recall bias and misclassification is another limitation. Moreover, DASS and PSQI tools do not provide diagnostic of depression and sleep disorders and we used them as assessment tools. Also, we could not assess the percentage of energy as animal fat and protein among patients, regarding we have no separate data for these items in Iran food intake databases. It seems that patients who consumed lower carbohydrate have better sleep status and are less involved with mental disorders. However, regarding the nature of the present study, well-designed cohort studies are suggested to be conducted in the future. © 2020 Society of Chemical Industry.

**Keywords:** anxiety; depression; diabetes; dietary pattern; low-carbohydrate diet; sleep



## POLICY ANALYSIS OF IRON DEFICIENCY ANEMIA PREVENTION IN IRAN: A QUALITATIVE STUDY

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**Background and Aim:** Iron deficiency anemia (IDA) is a type of anemia that is considered as a global health problem by the World Health Organization. Iran is trying to control and prevent it as a developing country with moderate prevalence. This study aimed to analyze the current policies of IDA prevention in Iran.

**Methods:** Data were collected by reviewing relevant documents and also semi-structured face-to-face interviews with key stakeholders through targeted snowball sampling. Policy triangle framework along with Kingdon's multiple flow theory was used for data analysis. MAXQDA software was also used to manage the data analysis.

**Results:** The main contextual factors affecting IDA in Iran were socioeconomic, structural, cultural, and political factors. Content of IDA prevention in the national policies were mostly about supplementation, fortification, sufficient and practical education and parasite elimination. The stakeholders of IDA prevention policies in Iran were classified into governmental and non-governmental organizations groups. Weak involvement of the media and education for public awareness, insufficient provision of required budgets, lack of inter-organizational coordination, lack of common goals and vision between the institutions and organizations involved, and lack of specialized trained personnel in the implementation of the program are some of the identified challenges regarding IDA in Iran.

**Conclusion:** This policy analysis allows the policy makers to revise the country's current policies regarding IDA and modify it according to the country's current facilities and conditions and adopt new policy options for the prevention of IDA.

**Keywords:** Policy analysis, Prevention, Iron deficiency anemia



## EVALUATING THE EFFECT OF USING NUTRITION APPS ON RESPONDING TO HEALTH REQUESTS OF OLDER ADULTS WITH TYPE 2 DIABETES: A SYSTEMATIC REVIEW

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**Background and Aim:** Diabetes mellitus, particularly type 2, is a common disorder among older adults that burdens the healthcare system. M Health being a subset of telemedicine, utilizes smartphones and tablets to deliver treatment remotely. This study evaluates the acceptability of mHealth and nutrition applications for diabetes management in middle-aged and older adults.

**Methods:** Data were collected by searching the PubMed, Scopus, SID, and Google Scholar databases. Advanced search keywords include: "mobile health," "mHealth," "mobile nutrition apps," "fitness apps," "nutrition," "diet," "nutritional intervention", "youth", "elderly", "middle age" and "diabetes". The search was limited to English-language studies with available full texts. Reviews, duplicates and irrelevant articles were excluded.

**Results:** In this review, 41 articles were extracted, from which 20 key topic articles were selected and reviewed and nutrition apps have significantly improved glycemic control, encouraged better eating habits, promoted medication adherence, and increased physical activity. Effective verbal and cooperation-communication between patients and healthcare professionals has also evolved with this technology emphasizing behavioral change. High user satisfaction with corresponding surveys indicates the acceptance of these digital tools. Additionally, combining AI and human intelligence improves clinical outcomes rather than using it alone. However, performance based on the interface and customization options produced different results.

**Conclusion:** This systematic review shows that Mobile health technologies providing personalized care anytime, anywhere, promoting good dietary choices for people with diabetes and continuously monitoring health status in collaboration with healthcare providers can be effective treatment strategies.

**Keywords:** mobile health (mHealth), mobile nutrition apps, fitness app, adolescent, middle-aged, Diabetes





## THE EFFECT OF FISH OIL ON BODY COMPOSITION IN ADULTS: A LITERATURE REVIEW

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**Background and Aim:** Since the human body is unable to produce omega-3 polyunsaturated fatty acids (PUFA), it must get them through diet. The highest dietary concentrations of PUFA linked to the greatest health advantages are found in fish and seafood, specifically in the fattest varieties of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Compared to the commonly used BMI, body composition provides more accurate information about the body's adiposity and reflects nutritional status. Adults' increases in fat mass (FM) and fat-free mass (FFM) vary significantly amongst individuals, highlighting the significance of assessing body composition—especially in light of the possible health hazards associated with obesity. It has been suggested that eating fish oil can help people lose a small amount of weight and body fat percentage (BF %). The purpose of this review is to evaluate the effect of fish oil on body composition.

**Methods:** Researchers searched for relevant citations from 2015-2023 using Scopus, PubMed, and Google Scholar to analyze fish oil, body composition, and daily intake. They also looked over these studies' complete manuscripts.

**Results:** Fish oil-derived n-3 PUFA supplementation increased thigh and waist circumferences significantly when compared to the control group, but it had no significant effect on changes in weight, body mass index, or fat-free mass.

**Conclusion:** Research suggests that fish oil, derived from n-3 polyunsaturated fats, can improve body composition, muscle strength, physical performance, and serum lipid profiles without causing weight gain or adiposity. Therefore, it is advised that future research utilize carefully thought out dose-dependent studies.

**Keywords:** Fish oil, Body composition, Pufa, DHA, EPA



## SUNFLOWER OIL FLAVORED BY SAFFRON (CROCUS SATIVUS L.) BY VARIOUS MACERATION-ASSISTED PROCESSES

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**Background and Aim:** The use of flavored oils is a growing global trend, driven by objectives such as enhancing stability, expanding market potential, and improving sensory qualities. This research aims to enhance the stability, aroma, and flavor of sunflower oil through the process of flavoring it with saffron stigma using various methods.

**Methods:** Sunflower oil was aromatized using ultrasound technique (probe and bath), microwave treatment, and stirring-assisted maceration. The effective parameters of each extraction process were optimized.

**Results:** Despite the high concentration of saffron compounds extracted by ultrasound system, it results in oils with undesirable sensory characteristics. Conversely, the stirring-assisted maceration method yielded the most favorable aromatized oil in terms of aroma and smell, with content levels of 317.2, 55.8, and 158.10 mg L<sup>-1</sup> of picrocrocin, safranal, and crocins compounds, respectively. The optimal oil sample exhibited total polyphenol and total carotenoid levels of 11.6 mg GAE g<sup>-1</sup> and 1.4 mg Kg<sup>-1</sup>, respectively. Additionally, its acid value and peroxide value were 1.8 mg KOH g<sup>-1</sup> and 5.3 meqO<sub>2</sub> Kg<sup>-1</sup>, respectively. The antioxidant capacity of the optimal oil sample was determined to be 49.6%, with K232 and K268 values of 11.2 and 1.9, respectively.

**Conclusion:** The aromatized sunflower oil exhibited pleasant color, aroma, and taste improvements. Its physicochemical properties were enhanced, positioning it as a functional and appealing oil. Consumers may embrace it as a novel product for various culinary applications, such as salads and rice, given its improved physical and chemical characteristics.

**Keywords:** Sunflower oil; Saffron (*Crocus sativus* L.); Oil aromatization; Ultrasonic assisted maceration; Stirring assisted maceration



## THE THERMOGENIC EFFECTS OF RESVERATROL SUPPLEMENTATION ON BROWN ADIPOSE TISSUE (BAT) AS A POTENTIAL TREATMENT FOR OBESITY

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**Background and Aim:** Obesity is a major cause of death worldwide and increases the risk of developing a wide range of non-communicable comorbidities. Current evidences suggest that Resveratrol, a phenolic compound that belongs to the stilbene group, may reduce obesity by inducing thermogenesis.

**Methods:** A precise search was carried out across PubMed, Scopus, Web of Science, and Google Scholar without applying any year filter. Studies were found by using the keywords. After studying and evaluating, 33 articles were included in this study.

**Results:** Resveratrol has been found to induce thermogenesis by activating BAT and inducing WAT browning. Both of these processes lead to an increment in thermogenesis. Resveratrol has been demonstrated to effectively induce thermogenesis through stimulation of  $\beta$ 3-adrenergic receptors and increased expression of UCP1. Actually, it can positively impact mitochondrial biogenesis by regulating the expression of PRDM16 and activating key transcription factors, PGC-1 $\alpha$  and PPAR- $\alpha$  besides increasing the production of SIRT3, a protein involved in the regulation of mitochondrial function. Also, resveratrol exhibits the potential to enhance BAT differentiation, owing to its ability to activate PPAR $\gamma$ . These various mechanisms collectively contribute to an increase in thermogenesis, which can lead to a subsequent increase in energy expenditure and a reduction in overall body weight.

**Conclusion:** Resveratrol may have a positive effect on BAT activation, browning of WAT and combatting obesity through upregulation of different signaling pathways; But further human studies are necessary in order to confirm these findings, as there is currently a lack of clinical trial studies.

**Keywords:** Resveratrol, Brown Adipose Tissue (BAT), Thermogenesis, Energy Metabolism, Obesity



## NUTRACEUTICAL SUPPLEMENTS IN MANAGEMENT OF OSTEOARTHRITIS

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**Background and Aim:** Osteoarthritis (OA) is a degenerative chronic joint cartilage disorder and the most prevalent and principal reason for joint pain and functional impairment in the world. The purpose of this study is to perform a systematic review and meta-analysis of relevant randomized controlled trials to assess the efficiency of different dietary supplements in the management of the symptoms of hip/knee OA.

**Methods:** A precise and comprehensive academic literature search of the titles, abstracts and keywords of all studies for competency independently through electronic databases (MEDLINE, Web of Science, Cochrane Library, Scopus, EMBASE, Google Scholar, Clinicaltrials.gov, Science direct, and ProQuest in addition to SID, Magiran, Iran-doc, and Iranmedex for Persian language literature) was done. Thereupon, the primary outcome measures included for this review were mean changes in the Western Ontario and McMaster Universities Arthritis Index (WOMAC) total, WOMAC pain, WOMAC stiffness, WOMAC physical function and pain Visual Analogue Scale (VAS). The systematic searching of the databases identified 1323 articles, of which 858 were excluded as duplicates, 372 were excluded by title and abstract and 52 were excluded after reviewing full texts. This comprehensive systematic review and meta-analysis including 42 RCTs (4160 participants) and 33 supplements assessed the clinical effectiveness of different nutraceutical supplementation in the management of knee/hip OA symptoms, principally concentrating on pain and functional outcomes. Papers were written in English or Persian. A total of 42 RCTs were involved in the meta-analysis. Nutritional supplementation were found to improve total WOMAC index (SMD = -0.23, 95% CI -0.37 to -0.08), WOMAC pain (SMD = -0.36, 95% CI -0.62 to -0.10) and WOMAC stiffness (SMD = -0.47, 95% CI -0.71 to -0.23) subscales and VAS (SMD = -0.79, 95% CI -1.05 to -0.05). Results of subgroup analysis according to the supplementation duration showed that the pooled effect size in studies with < 10 months, 10–20 months and > 20 months supplementation duration were 0.05, 0.27, and 0.36, respectively for WOMAC total score, 0.14, 0.55 and 0.05, respectively for WOMAC pain subscale, 0.59, 0.47 and 0.41, respectively for WOMAC stiffness subscale, 0.05, 0.57 and 0.53, respectively for WOMAC physical function subscale and 0.65, 0.99 and 0.12, respectively for VAS pain. In studies with short term duration of supplementation, significant effects of nutraceutical supplement only were seen on VAS and WOMAC stiffness scores. In the subgroup analysis, the greatest efficacy of nutraceutical supplements on WOMAC index total score



and its subscales and also VAS was related to medium term supplementation (10 to 20 months).

**Conclusion:** In conclusion, nutraceutical supplementation mostly along with symptomatic treatments may effectively improve pain and physical function in patients with knee/hip OA. In the subgroup analysis, the greatest efficacy of nutraceutical supplements was related to 10–20 month (medium term) supplementation especially in patients with mild to severe knee OA. Despite recognized supplements with no established significant efficacy in our study (such as glucosamine and vitamin D), some not well-known supplements (*Boswellia serrata* extract, Deer bone extract, extract of the skin of the passion fruit, collagen peptides isolated from pork skin, *A. paniculata* purified extract (ParActin), *Artemisia annua* extract and Pycnogenol) seem to have largest benefits in decreasing pain and improving physical function with negligible adverse events. It is recommended to trying these supplements in a safe doses along with conventional symptomatic treatments and physical therapy for at least 10 weeks especially for those with mild to moderate knee OA except low dose Sierrasil in addition to cat's claw extract, fortified bioactive micronutrient beverage, SKI306X is a herbal mixture (*Clematis mandshurica*, *Trichosanthes kirilowii* and *Prunella vulgaris*), L-carnitine, milk protein concentrate and hyaluronic acid which are expected to have beneficial effects in decreasing pain and/or disability in less than 10 weeks of supplementation and also probiotic probiotic *Lactobacillus casei* Shirota and undenatured type II collagen which are not anticipated to have favorable effects in less than 20 weeks of supplementation even in patients with mild knee OA.

**Keywords:** Nutraceutical; Osteoarthritis; Western Ontario and McMaster Universities Arthritis Index; Visual Analogue Scale



## PROBIOTIC SACCHAROMYCES BOULARDII (S. BOULARDII) IMPROVED CLINICAL AND PARACLINICAL INDICES IN PATIENTS WITH KNEE OSTEOARTHRITIS

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**Background and Aim:** This study aimed to determine the effect of the probiotic *Saccharomyces boulardii* (*S. boulardii*) in patients with knee osteoarthritis (KOA).

**Methods:** In this study, 70 patients with KOA were recruited via outpatient clinics between 2020 and 2021 and randomly assigned to receive probiotics or placebo supplements for 12 weeks. The primary outcome was a change in pain intensity according to the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain score.

**Conclusion:** Sixty-three patients completed the trial. The probiotic was better than the placebo in decreasing the WOMAC pain [-2.14 (95% CI: -2.76 to -1.51)], WOMAC stiffness [-0.81 (95% CI: -1.26 to -0.36)], WOMAC physical dysfunction [-2.30 (95% CI: -3.83 to -0.77)], and WOMAC total scores [-5.23 (95% CI: -7.27, -3.18)] and visual analogue scale pain intensity [-1.15 (95% CI: -2.76 to -1.51)]. The serum high-sensitivity C-reactive protein and malondialdehyde decreased significantly [-2.45 µg/ml (95% CI: -3.05 to -1.86) and -1.87 nmol/ml (95% CI: -2.48 to -1.25)], respectively] and the serum total antioxidant capacity increased significantly [+0.67 mmol/L (95% CI: 0.24 to 1.08)] in the probiotic group compared to the placebo. Probiotic was better than placebo in improving the scores of role disorder due to physical health ( $p=0.023$ ), and pain ( $p=0.048$ ) quality of life (QoL) dimensions and physical health QoL subscale ( $p=0.031$ ). This trial showed a significant improvement in pain intensity, physical dysfunction, some dimensions of QoL, and inflammatory and oxidative stress biomarkers with probiotic *S. boulardii* supplementation in patients with KOA with no severe side effects.

**Keywords:** Osteoarthritis, Probiotic, *S. boulardii*, Visual analogue scale, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)



## THE EFFECT OF THE DIETARY APPROACHES TO STOP HYPERTENSION (DASH) DIET ON SLEEP, MENTAL HEALTH, AND HORMONAL CHANGES: A RANDOMIZED CLINICAL TRIAL IN WOMEN WITH TYPE 2 DIABETES

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**Background and Aim:** Diabetes is a critical non-communicable disease and a severe worldwide public health problem. A complex interaction between the genetic predisposition, the environmental factors, and human behaviors such as inactivity and unhealthy diets can cause an increased risk of diabetes mellitus. Some previous studies have shown that higher consumption of refined grains, sugar-sweetened beverages, saturated fatty acids, and processed meats are associated with psychological disorders. However, several studies have shown that consumption of legumes, nuts, vegetables, fruits, and unrefined grains seem to be associated with a reduced risk of depression and anxiety. Hence, some dietary patterns may improve diabetes complications through scavenging oxidants and anti-inflammatory properties. This study evaluated the effect of the Dietary Approaches to Stop Hypertension (DASH) diet on sleep status, mental health, and hormonal changes among Iranian women with type 2 diabetes.

**Methods:** Methods: The study was conducted from July 2018 to March 2019. Inclusion criteria were as follows: postmenopausal women with T2DM, willing to participate in the trial, history of taking a stabilized dose of oral anti-diabetic medication, no history of taking supplements within 3 months. Patients who were undertaken medical treatment including anti-obesity, anti-inflammatory or psycho medication, insulin therapy, hormone therapy, having other clinical diseases such as type 1 diabetes, liver and kidney damage, asthma, malignancy and cancers, gastrointestinal diseases, food allergy, hormonal disorders, pancreatitis, and thyroid dysfunction not included in the study. The exclusion criteria were any change in medical treatments during the trial, lack of compliance in taking less than 80% of the dietary advice, and if they did not return to the clinic for follow-up visits. Overall, this randomized controlled trial (RCT) included 66 diabetic women. Participants were randomly divided into the two different diet groups (the DASH diet and control diet; 33 patients in each group) for 3 months. The Pittsburgh Sleep Quality Index and the Depression, Anxiety, and Stress Scale-21 items were used to assess sleep and mental disorders, respectively. Fasting blood sugar, hemoglobin A1c (HbA1c), advanced glycation



end products (AGEs), as well as several sex hormones were evaluated at the beginning and the end of the trial. Results: Data from 66 participants were analyzed. Six patients did not complete the trial, therefore, they were replaced by some other patients and finally we considered all included participants using intention to treat (n=66). The mean age of patients in the DASH diet and control group were  $57.52 \pm 4.99$  and  $60.70 \pm 6.33$  years, respectively. A statistically significant difference was observed in socioeconomic status among the DASH diet and control group ( $P < 0.0001$ ). There were no significant differences in waist circumference ( $P = 0.286$ ), BMI ( $P = 0.594$ ), and physical activity ( $P = 0.092$ ) among the intervention and control groups at baseline. Anthropometric indices, HbA1c (control:  $8.77 \pm 0.82$  vs.  $8.04 \pm 1.03$ ; the DASH diet  $8.70 \pm 1.05$  vs.  $7.41 \pm 1.03$ ), and follicle-stimulating hormone (FSH) (control:  $72.16 \pm 26.02$  vs.  $68.12 \pm 27.63$ ; the DASH diet:  $72.99 \pm 25.19$  vs.  $67.43 \pm 27.63$ ) significantly decreased over 12 weeks in both the groups ( $P < 0.0001$ ). Testosterone, 2-h postprandial glucose (2hPPG), and AGEs significantly decreased over 12 weeks in the DASH diet group. Sleep, depression, and anxiety scores significantly decreased over 12 weeks in the DASH diet group. Night sleep duration significantly increased over 12 weeks in the DASH diet group ( $P < 0.0001$ ).

**Conclusion:** The present study was the first comprehensive study that revealed the effect of the DASH diet on several diabetes outcomes such as depression, anxiety, stress, sleep status, and the levels of some sex hormones. Information of physical activity and dietary records were assessed 7 times during the trial by the research team which led to better compliance, high accuracy, and unintended bias. However, several limitations should be considered in discussing the results. The reverse causation between diabetes and psychological disorders is unknown. The results are not generalizable to other populations of different ages and gender. Also, DASS-21 is not suitable for the clinical diagnosis of the outcomes and is an assessment tool for depression and anxiety. Moreover, we did not measure urinary or fecal AGEs. In conclusion, a 12-week DASH diet significantly decreases testosterone, 2hPPG, AGEs level, as well as sleep, depression, and anxiety scores in women with type 2 diabetes. However, more RCTs are needed to confirm these findings.

**Keywords:** anxiety; depression; diabetes; dietary approaches to stop hypertension; sleep





## ASSOCIATION OF DIETARY ACID LOAD AND PLANT-BASED DIET INDEX WITH SLEEP, STRESS, ANXIETY AND DEPRESSION IN DIABETIC WOMEN

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**Background and Aim:** Diabetes is a common chronic disease with various complications. On the other hand, diet is an important and modifiable environmental factor which can improve and impact on glycemic control as well as psychological disorders and sleep disturbances. Low glycemic index foods which contain high dietary fiber are associated with lower blood glucose. Moreover, zinc, magnesium and B-group vitamins which are in high amounts in vegetables are considered as some dietary nutrients which can decrease the risk of depression. Based on previous studies, these micronutrients can also lead to a good quality of sleep. Today, according to interaction and combination of various macro and micronutrient in a whole diet, epidemiological studies are conducted to determine the association of dietary patterns and dietary quality indices and various disease. Protective dietary patterns with the content of nuts, fruits, and vegetables are associated with reduced risk of depression. Plant-based diet index (PDI) and dietary acid load (DAL) are two indices to assess whole diet quality. As nutrients which present in vegetable and fruits have indicated good effects on sleep and psychological status, this study hypothesis that if a whole plant diet has a reduced association with sleep disturbances and psychological disorders. The present study was conducted to determine the association of PDI and DAL with sleep status as well as mental health in type 2 diabetic women.

**Methods:** Method: In this cross-sectional study, a validated FFQ was used to assess dietary intakes of 230 diabetic patients. We created a whole PDI, healthful PDI (hPDI) and unhealthful PDI (uPDI). DAL was calculated based on potential renal acid load and net endogenous acid production method. The Pittsburgh Sleep Quality Index and twenty-one-item Depression, Anxiety and Stress Scale were used to assess sleep and mental health disorders, respectively. Results: Participants in the top group of uPDI had greater risk of poor sleep (OR 6.47, 95 % CI 2.75, 15.24). However, patients who were in the top group of hPDI had a lower risk of sleep problems (OR 0.28, 95 % CI 0.13, 0.62). Participants in the top group of uPDI had greater risk of depression, anxiety and stress (OR 9.35, 95 % CI 3.96, 22.07; OR 4.74, 95 % CI 2.28, 9.85; OR 4.24, 95 % CI 2.14, 8.38, respectively).

**Conclusion:** This is the first study that DAL and plant-based diet were assessed with



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sleep and psychological status among diabetic patients. PDI has 3 subgroups which one of them is uPDI that include animal foods, therefore we could assess adherence of high-protein foods with considered outcomes in this study. We randomly included diabetic women from different socioeconomic status which could be a representative sample of diabetic women in Tehran. However, Observational nature of the present study should be considered in discussing the results, due to the interpretation of casual relationships. This study did not present laboratory markers of acid-base balance. FFQ is a questionnaire with misclassification bias and reports an error which is not especially validated for anions. In conclusion, participants with higher DAL scores and patients who adhered to animal-based diets rather than plant-based diets were more likely to be poor sleepers and have mental health disorders.

**Keywords:** Depression; Diabetic patients; Dietary acid load; Plant-based diet index; Sleep; Women.



## GINGER INTERVENTION ON GLUCOSE CONTROL AND INSULIN SENSITIVITY IN ADULTS: A GRADE-ASSESSED SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Ginger consumption may have a positive relationship with glucose control and insulin resistance, however, because of the contradictory results in the available trials, we decided to examine the net effects of ginger on glycemic parameters

**Methods:** Net changes in blood glucose, insulin, Homeostatic Model Assessment for Insulin Resistance (HOMA-IR), and HemoglobinA1c (HbA1c) were used to calculate the effect size, which was reported as a weighted mean difference (WMD) and 95% confidence intervals (CIs). Several databases were searched until 20th February 2022 to find trials exploring the influence of ginger on glucose control and insulin sensitivity.

**Results:** 23 trials (1229 participants) were included in the meta-analysis. Meta-analysis indicated a significant association between ginger supplementation and a reduction in blood glucose (WMD: -15.72 mg/dl; 95% CI: -20.69, -10.75 mg/dl;  $p < 0.001$ ), insulin (WMD: -1.45  $\mu\text{U/ml}$ ; 95% CI: -2.29, -0.62  $\mu\text{U/ml}$ ;  $p = 0.001$ ), HOMA-IR (WMD: -0.62, 95% CI: -1.01, -0.24,  $p = 0.001$ ), and HbA1c (WMD: -0.56 %; 95% CI: -0.92, -0.15%;  $p = 0.003$ ). Significant reductions in blood glucose were observed only in subsets of studies with baseline glucose  $\geq 100$  mg/dl and in subjects with BMI  $\geq 30$  kg/m<sup>2</sup>. The non-linear dose-response analysis showed a significant association between the ginger dose and blood glucose ( $P$  non-linearity = 0.029). Also, the duration of ginger intervention showed a significant nonlinear relationship with blood glucose ( $P$  non-linearity = 0.034) and HOMA-IR ( $P$  non-linearity = 0.016) in dose-response analysis. The possible effective dosage of ginger intervention and duration of ginger intervention was detected to be 2 g/d and lower than 10 weeks respectively.

**Conclusion:** Further well-constructed randomized clinical trials are needed

**Keywords:** Ginger, Blood glucose, Insulin resistance, Meta-analysis



## MONOCYTE TO HDL-C RATIO (MHR): A NOVEL BIOMARKER FOR MONITORING METABOLIC COMPLICATIONS IN NAFLD

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**Background and Aim:** As inflammation plays an important role in pathophysiology of non-alcoholic fatty liver disease (NAFLD). Apart from cytokines, systemic inflammation (intra- and extra hepatic) by relatively novel inflammatory indices such as monocyte to HDL-c ratio (MHR) appear to be associated with metabolic consequences. This study aimed to investigate the association between MHR and metabolic/ hepatic biomarkers in patients with NAFLD.

**Methods:** Two hundred and 38 adults (133 women and 105 men) patients with NAFLD confirmed by ultrasonography findings were studied in this cross-sectional study. Weight and height were measured and body mass index (BMI) was estimated. Indeed, after 12-14 hours fasting, serum levels of glucose, lipid profile and liver enzymes were assessed. Automated and calibrated Coulter CBCH1 counter were used for assessing monocyte count per mm<sup>3</sup> and MHR was calculated.

**Results:** Overweight (BMI=25-19.9 kg/m<sup>2</sup>) and mild hepato steatosis (grade I) were found in 71% and 58.8% of the patients, respectively. MHR in males was significantly greater than in females ( $p < 0.001$ ). By increasing the severity of steatosis, metabolic factors and liver enzymes ( $p < 0.05$ ) as well as MHR increased significantly ( $p = 0.011$ ) while AST/ALT ratio decreased ( $p = 0.046$ ). MHR was significantly correlated with serum levels of HDL-C ( $r = 0.395$ ,  $p < 0.001$ ), LDL-C ( $r = 0.223$ ,  $p = 0.001$ ), ALT ( $r = 0.154$ ,  $p = 0.018$ ), and AST/ALT ratio ( $r = -0.169$ ,  $p = 0.009$ ).

**Conclusion:** As MHR is correlated with some metabolic and liver function biomarkers in patients with NAFLD, it can be applied as an inexpensive, non-invasive, rapid, and inexpensive, and routine blood test for screening and monitoring hepato steatosis.

**Keywords:** Non-alcoholic fatty liver disease; Monocyte to HDL-c ratio; Metabolic factors; Liver function.



## ASSOCIATION BETWEEN HEALTHY EATING INDEX (HEI) AND RISK OF IRRITABLE BOWEL SYNDROME: A CASE-CONTROL STUDY

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**Background and Aim:** As diet can play an important role in the pathophysiology of Irritable Bowel Syndrome (IBS) and healthy eating index (HEI) is a useful tool for assessment of overall diet pattern; Therefore, we investigated the association between the HEI score and risk of IBS.

**Methods:** This case - control study was conducted on a 155 IBS cases and 310 age- and sex-matched healthy controls. Rome IV criteria was used to recognizing of IBS. The HEI score was computed based on dietary intake using a 168-item FFQ. The FFQ was analyzed using Nutritionist IV. Logistic regression models were used to estimate multivariable odds ratios (ORs).

**Results:** The mean HEI score was lower among IBS patients in comparison to healthy controls ( $41.11 \pm 5.32$  vs.  $41.21 \pm 5.20$ ). In crude model and after adjusting for age and sex, increase in HEI as continuous variable was associated with increase in the risk of IBS respectively (OR (95% CI): 0.96 (0.99-1.03)) and (OR (95% CI): 0.99 (0.96-1.03)). But, after multivariate adjustment (OR (95% CI): (0.96-1.05) 1.00) this effect was neutral. In crude and age and sex adjusted models subjects in fourth quartile of HEI had lower OR in comparison to subjects in first quartile. But these results were not statistically significant.

**Conclusion:** Although the relationship between HEI and IBS risk was not significant, but it seems a higher adherence to HEI will be associated with reducing risk of IBS.

**Keywords:** Dietary assessment, Healthy Eating Index (HEI), Irritable Bowel Syndrome (IBS), diet quality



## THE ASSOCIATION BETWEEN OVERALL, HEALTHY, AND UNHEALTHY PLANT-BASED DIET INDEX AND RISK OF METABOLIC SYNDROME: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS

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**Background and Aim:** We hypothesized that a plant-based diet considering the plant foods quality in the framework of plant-based diet indices (overall plant-based diet index (oPDI), healthy plant-based diet index (hPDI) and unhealthy plant-based diet index (uPDI)) may be associated with risk of metabolic syndrome (MetS).

**Methods:** A comprehensive search was conducted on electronic databases, namely PubMed, Web of Science, and Scopus, from January 2016 to November 2023. The I<sup>2</sup> statistic was used to perform heterogeneity tests. A random effects model was used to estimate pooled Effect sizes (ES) and 95% confidence intervals (95% CI). To assess the heterogeneity of included studies, the I<sup>2</sup> index was used.

**Results:** From 288 initial records, a total of nine studies met the inclusion criteria. According to pooled analysis, there was a significant relationship between the adherence to H-PDI and the lower risk of MetS (ES:0.81;95%CI:0.67-0.97;I<sup>2</sup>=77.2%), while greater adherence to U-PDI was associated with higher risk of MetS (ES:1.27;95%CI:1.05-1.54;I<sup>2</sup>=76.8%). According to our analysis of the association between adherence to PDIs and the risk of MetS components, greater adherence to O-PDI and H-PDI was significantly associated with a higher risk of elevated FBS and obesity, respectively. As well, greater adherence to U-PDI was significantly associated with a higher risk of obesity, Hypertriglyceridemia, low HDL-C, and elevated FBS.

**Conclusion:** Our results confirmed the importance of plant-based food quality in the risk of MetS and its related components, as well as highlight the importance of considering the quality of plant foods as healthy and less-healthy in future research.

**Keywords:** plant-based diet index;metabolic syndrome;metabolic syndrome components;meta-analysis;systematic review



## THE ASSOCIATION BETWEEN OVERALL, HEALTHY AND UNHEALTHY PLANT-BASED DIET INDEX AND RISK OF ALL-CAUSE, AND CAUSE-SPECIFIC MORTALITY: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF PROSPECTIVE COHORT STUDIES

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**Background and Aim:** We hypothesized that plant-based diet with considering the plant foods quality in the framework of plant-based diet indices (overall plant-based diet index (oPDI), healthy plant-based diet index (hPDI) and unhealthy plant-based diet index (uPDI)) may be associated with risk of all-cause and specific-cause mortality.

**Methods:** A comprehensive search was conducted on electronic databases, namely PubMed, Web of Science, and Scopus, up until August 2023. The I<sup>2</sup> statistic was used to perform heterogeneity tests. The assessment of random effect models was conducted by utilizing heterogeneity tests, while the examination of pooled data was performed to ascertain the weighted mean difference (WMD) along with a 95% confidence interval (CI).

**Results:** From 181 initial records, a total of 16 studies met the inclusion criteria. The findings of our study indicated a strong correlation between higher adherence to the oPDI and reduced risk of all-cause mortality as well as mortality related to CVDs, CHD, cancer, lung cancer and prostate cancer. Subgroup analysis showed that sex, duration of follow-up, BMI, adjustments for T2DM, and serum cholesterol were all potential sources of heterogeneity. Also, adherence to the hPDI was found to reduce risk of all-cause, CHD and cancer mortality, whereas uPDI was shown to increase risk of all-cause, CVD, CHD, and cancer mortality.

**Conclusion:** Our results confirm negative association between the long-term adherence to plant-based diets and risk of mortality observed in previous studies, as well highlight the importance of considering the quality of plant foods as healthy and less-healthy in future research.

**Keywords:** plant-based diet, mortality, chronic disease related mortality, meta-analysis



## ASSOCIATIONS OF DIETARY ADVANCED GLYCATION END PRODUCTS (DAGES) WITH RISK OF ALBUMINURIA IN PEOPLE WITH TYPE 1 DIABETES MELLITUS

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**Background and Aim:** Uncontrolled diabetes may cause acute and long-term complications. Which in addition to abnormal glucose hemostasis, increased levels of advanced glycation end products (AGEs) may contribute to the etiology of diabetes complications. Therefore, this study was conducted to investigate the associations of dietary advanced glycation end products (dAGEs) with albuminuria among patients with T1DM.

**Methods:** This cross-sectional study was conducted on 229 Iranian with type 1 diabetes. We obtained dAGEs data using a validated food frequency questionnaire (FFQ). Albuminuria was determined using urinary albumin:creatinine ratio (ACR) (> 30 mg/g). The associations of dAGEs and albuminuria was assessed using binary logistic regression.

**Results:** The mean age of participants was  $32.31 \pm 10.96$  years. After adjustment for covariates, patients with T1DM in the highest tertile of dAGEs had 3.89 times higher odds of albuminuria compared to those in the lowest tertile (OR: 3.89, 95% CI: 1.73–8.82).

**Conclusion:** We found that higher intake of AGEs through a high-AGEs diet, was associated with a higher risk of albuminuria. Therefore, reducing the intake of such foods may be useful in protecting the kidneys in people with type 1 diabetes.

**Keywords:** Type 1 diabetes; Dietary AGEs; albuminuria





## THE EFFECT OF GLUTEN FREE DIET ON COMPONENTS OF METABOLIC SYNDROME: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** This study aimed to assess the effects of Gluten free diet (GFD) on components of metabolic syndrome (MES).

**Methods:** In this randomized clinical trial, 50 subjects diagnosed with MES were randomly divided into two groups (n=25). The first group received a GFD and the second group continued their regular diet. Biochemical markers of MES and blood pressure were measured before and after 8-week intervention.

**Results:** Forty five subjects completed the study. A post-hoc comparison of the groups showed no effects of the GFD and control diet on LDL cholesterol, total cholesterol, fasting insulin, HOMA-IR, systolic and diastolic blood pressure levels. The GFD reduced fasting blood glucose, waist circumference (WC) and serum triglyceride concentration significantly compared with the control diet ( $p < 0.05$ ).

**Conclusion:** Short-term GFD reduced WC and improved glycemic control and Triglyceride level in subjects with the metabolic syndrome.

**Keywords:** Gluten free diet; metabolic syndrome; obesity.



## MAJOR DIETARY PATTERNS IN RELATION TO DISEASE SEVERITY, SYMPTOMS, AND INFLAMMATORY MARKERS IN PATIENTS RECOVERED FROM COVID-19

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**Background and Aim:** This study aimed to evaluate the association between major dietary patterns before COVID-19 diagnosis in recovered patients and the risk of disease severity and symptoms after the disease begins.

**Methods:** 250 recovered cases with both genders completed study questionnaires providing data on demographic characteristics, self-reported web-based 168-item food frequency questionnaire (FFQ), and COVID-19 outcomes in Shahid Beheshti Hospital, Kashan. PCR was used to determine a positive diagnosis of COVID-19. We used multi-variable logistic regression models to assess the association between major dietary patterns and study outcomes.

**Results:** Serum levels of CRP and ESR were significantly higher in patients with unhealthy and traditional dietary patterns and lower in those with healthy dietary patterns. There was a significant direct relationship between unhealthy and traditional patterns with risk of severe COVID-19 and hospitalization duration and a significant direct association between an unhealthy pattern and the odds ratio of convalescence duration. A significant inverse relationship was found between healthy pattern and risk of severe COVID-19 and OR of convalescence duration. We found a significant direct association between unhealthy pattern and OR of cough, fever, chilling, weakness, myalgia, nausea and vomiting, and sore throat and between traditional pattern and OR of cough, fever, and chilling. In contrast, a significant inverse association was seen between healthy pattern and OR of dyspnea, weakness, and sore throat.

**Conclusion:** A direct association was found between unhealthy and traditional patterns and the risk of some COVID-19 symptoms, while an inverse association was found for a healthy dietary pattern.

**Keywords:** dietary patterns, COVID-19, inflammation, symptoms, disease severity



## CURCUMIN EFFECTS ON LIVER ENZYMES OF NONALCOHOLIC FATTY LIVER DISEASE PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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**Background and Aim:** Curcumin has been assumed as a beneficial treatment for NAFLD. The aim of current meta-analysis was to summarize earlier results related to the effect of curcumin on liver enzymes and alkaline phosphatase in NAFLD patients.

**Methods:** studies published up to November 2022 were searched through the PubMed, SCOPUS, and WOS to collect all RCTs on NAFLD patients in which curcumin was used as a treatment. To measure pooled effect sizes, we used random-effects model. Weighted mean differences and 95% confidence intervals were used to report pooled effect sizes.

**Results:** Finally, sixteen studies were included in this systematic review and meta-analysis. Our pooled meta-analysis showed a significant reduction in alanine aminotransferase after curcumin therapy by pooling 14 effect sizes (WMD: -7.78; 95% CI: -13.5, -2.07, I<sup>2</sup> = 93.6%) and in aspartate aminotransferase based on 15 effect sizes (WMD: -5.68; 95% CI: -8.74, -2.63, I<sup>2</sup> = 94%).

**Conclusion:** However, the pooled analysis of 5 trials indicated that there was no significant association between curcumin therapy and alkaline phosphatase (ALP) in NAFLD patients. Nevertheless, subgroup analyses showed significant effects of curcumin on ALP with a longer duration of supplementation. The results of this meta-analysis support the potential effect of curcumin for the treatment of NAFLD. Further randomized controlled trials should be conducted in light of our findings.

**Keywords:** Alanine aminotransferase, Alkaline phosphatase, Aspartate aminotransferase, Curcumin



## EVALUATION OF NUTRITIONAL STATUS IN PATIENTS WITH DYSPHAGIA AFTER ANTERIOR CERVICAL DISCECTOMY AND FUSION(ACDF)

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**Background and Aim:** Anterior neck discectomy with fusion is a surgical treatment method used when conservative treatment fails. This method has been limitedly studied and is considered the gold standard for treating radiculopathy, cervical myelopathy, and intervertebral disc patients. However, dysphagia is a potential complication that can occur both before and after the surgery. Considering the impact of swallowing function on people's nutritional status and quality of life., therefore, the present study was conducted with the aim of investigating the nutritional status of these patients.

**Methods:** This is a cross-sectional descriptive study that evaluated 88 patients at four different time points: before surgery, one week after surgery, six weeks after surgery, and six months after surgery. The study used the EAT-10 questionnaire. The patients were selected from Al-Zahra and Kashani hospitals in Isfahan province, between the years 2022 and 2023.

**Results:** The number of patients with dysphagia before surgery was 88, one week after surgery 85, six weeks after surgery 19 and six months after surgery 12. The results of this study showed that the nutritional status of the patients improved significantly one week after the operation compared to before the operation, Although improvement occurred from six weeks later and six months later, it did not show a significant difference compared to one week after the operation.

**Conclusion:** In patients with dysphagia who undergo ACDF surgery, nutritional status improved one week after the operation, but this improvement is not long-term and is not effective in six weeks and six months after the operation.

**Keywords:** dysphagia, ACDF, nutritional status



## THE PREVALENCE OF FOOD INSECURITY AND ITS DETERMINANTS AMONG RURAL WOMEN LIVING IN THE COUNTIES OF TEHRAN PROVINCE

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**Background and Aim:** Food insecurity is a major health problem in developing countries. It has been shown that rural inhabitants are more vulnerable to food insecurity. So the aim of this study was to examine the prevalence of food insecurity and its determinants among rural women in the counties of Tehran province.

**Methods:** This cross-sectional study was conducted among rural women living in the five counties of Tehran province (including: Ray, Islamshahr, Mallard, Varamin, and Shahr-yar) from January to October 2022. Totally, 303 women were selected randomly from 32 villages. To collect data, four questionnaires were used including: 1. General information, 2. Women's empowerment, 3. Nutritional knowledge, and 4. Household Food Insecurity Access Scale (HFIAS). Data was analysed using the IBM SPSS version 21 software. A p-value less than 0.05 was considered as statistically significant.

**Results:** The mean age of participants was 42.72±8.92 years. The prevalence of mild, moderate and severe food insecurity was 33%, 22.4% and 8.9% respectively. The results indicated that household monthly income, the employment status of household's head and life facilities were significantly associated with food insecurity ( $P < 0.05$ ). Other investigated variables were not associated with food security including: women's nutritional knowledge and empowerment status, the educational level of participants and household size ( $P > 0.05$ ).

**Conclusion:** Considering the high prevalence of food insecurity in the villages of Tehran counties, policy makers and planners are suggested to take measures to improve employment status and the household income level in rural areas.

**Keywords:** food security, rural women, nutritional knowledge, Women's empowerment, socio-economic status



## RESVERATROL PROTECTS AGAINST LIPID MICELLE-INDUCED OXIDATIVE STRESS AND TOXICITY IN CACO-2 INTESTINAL EPITHELIAL CELLS

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**Background and Aim:** Excess dietary fat and associated bile acids can impair intestinal barrier integrity which may lead to increased permeability and inflammation. Dietary polyphenols can reach the intestine in relatively high concentrations and may impose important effects on intestinal epithelial cells to help prevent oxidative stress and strengthen the intestinal barrier. In a Caco-2 cell model of dietary fat-induced intestinal epithelial cell cytotoxicity, we investigated potential protective effects of resveratrol.

**Methods:** Caco-2 cells were pre-treated with resveratrol prior to exposure with mixed micelle (MM) composed of bile salts and fatty acids. Cells were then evaluated for cell viability, intracellular ROS generation (DCFH-DA), mitochondrial content, and relative mRNA expression (using RT-qPCR) of genes involved in mitochondrial biogenesis (PGC1 $\alpha$ , NRF1, TFAM) and Mn-SOD and TNF- $\alpha$  genes, and cell permeability (TEER).

**Results:** Exposure of the Caco-2 intestinal epithelial cells to MM, decreased cell viability, increased intracellular ROS generation, decreased mitochondrial content, increased expression of mRNA for Mn-SOD and the pro-inflammatory cytokine TNF- $\alpha$ , and increased cell monolayer permeability. Treatment with 20  $\mu$ M resveratrol, significantly protected from MM-induced cytotoxicity, strongly protected against the MM-induced rise in intracellular ROS generation and expression of Mn-SOD and TNF- $\alpha$ . Resveratrol, increased mitochondrial content and genes involved in mitochondrial biogenesis and ameliorated the increased monolayer permeability following MM challenge.

**Conclusion:** The results suggest a role for resveratrol rich foods in conferring resistance to excess dietary fat through protection against cell toxicity, oxidative stress and barrier dysfunction in intestinal epithelial cells with implications for health and disease in people consuming a Western diet.

**Keywords:** Resveratrol; Mixed micelle; Antioxidant; Mitochondria; Intestinal permeability



## GEONUTRITION ANALYSIS: A STEP TOWARDS THE FUTURE IN FOOD AND NUTRITION SYSTEMS AND POLICY MAKING

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**Background and Aim:** The Geographic Information System (GIS) was first used in the mid-1960s in the United States, utilizing aerial photos, land maps, agricultural, and forestry information. Nutrition, as one of the most important components of Primary Health Care (PHC), is one of the most important platforms for using GIS methods in the analysis of nutritional patterns. There is no need for major changes in conducting a nutrition survey or identifying the best clinical design.

**Methods:** This is a scoping review study that used a combination of keywords such as Nutrition, GIS, Geographic Information System, Nutrition Indicators, Diet, Malnutrition, Nutrition Surveys, Spatial analysis, and Mapping using the Publish or Perish software in the Scopus, Google Scholar, PubMed, Crossref, SID and Irandoc databases. The historical range of the search was from 2010 to the end of 2023.

**Results:** Out of 58 articles, with the application of exit and entry criteria and repetition, 23 relevant articles were found, which were mainly related to food security, obesity, and nutritional studies. The heavy dependence of agricultural analyses on GIS has led to its increasing use for food security analyses.

**Conclusion:** Food security has been the most important dimension of using this science. In other health areas, especially resource allocation, hospital visibility outside fault zones, etc., it has increased significantly. The use of interdisciplinary fields and specialists in this science, which mainly dedicate themselves to geography and geology, can provide spatial analyses for the advancement of nutrition science and finding connections and cause-finding of ambiguous points of nutrition science.

**Keywords:** Geonutrition Analysis; GIS; Food and nutrition policy



## EXAMINING THE COMPLIANCE OF TRAINING CONTENT PROVIDED TO RURAL WOMEN IN A HOMESTEAD FOOD PRODUCTION PROGRAM WITH THE DESIGNED BOOKLET

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**Background and Aim:** A homestead food production program was implemented in rural areas of Iran for a five-year period from 2017. The aim of this study was to assess the compliance of training content provided to rural women living in Tehran province by the mentioned program with the content of related designed booklet.

**Methods:** This is a descriptive and qualitative study. The data of the study contained program documents (including: training files, reports, minutes etc.) (n=210) as well as the content of interviews (N = 48). Quantitative Content analysis was done using MAXQDA 2010 software, with inductive and deductive approaches. In this regard, initial open-ended coding was performed followed by axial coding. Next, the subthemes were categorized based on the chapters of booklet.

**Results:** Totally, 278 codes were extracted and categorized as 13 subthemes. Based on the results, more than 67% of training codes belong to the first three chapters entitled "The principles of proper nutrition, correction of consumption pattern, food hygiene and safety". The lowest identified codes (0.70%) was belong to the chapter of "Purchasing management in the household", followed by the chapter of "Nutritional requirements" (1.4%). The last two chapters of the booklet, which are related to homestead food production, were covered with about 19% of the total codes in delivered trainings.

**Conclusion:** Based on the results, some topics of the booklet were covered well by executors during training the rural women but some not, so they need to be considered.

**Keywords:** qualitative study, content analysis, homestead food production program, training, nutrition, home garden





## THE IMPACT OF EXERCISE ON VITAMIN D LEVELS: A COMPREHENSIVE REVIEW

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**Background and Aim:** Vitamin D is a crucial nutrient that plays a significant role in human health, including bone health, and the regulation of various physiological processes. Exercise is also known to have numerous health benefits. This comprehensive review aims to examine the impact of exercise on vitamin D levels in the body.

**Methods:** A systematic search was conducted using electronic databases, including PubMed, Scopus, and Web of Science, to identify relevant studies published between 2010 and 2023. The search terms used included "exercise," "physical activity," "vitamin D," and "serum levels." The studies encompassed both observational and intervention studies, covering a wide range of populations and exercise modalities.

**Results:** Regular physical activity, particularly outdoor activities, may contribute to higher serum vitamin D levels. However, more research is needed to fully elucidate the relationship between exercise and vitamin D.

**Conclusion:** Vitamin D is fat-soluble and can be stored in adipose tissue, so individuals with higher muscle mass and lower body fat may have a greater capacity to store and utilize vitamin D. However, it is important to note that the relationship between exercise and vitamin D levels is complex and influenced by various factors, including geographical location, season, and dietary intake of vitamin D. Additionally, the specific type, intensity, and duration of exercise may also impact vitamin D levels differently. Further research is needed to better understand the mechanisms underlying the relationship between exercise and vitamin D levels. Additionally, studies exploring the optimal exercise regimens and strategies to optimize vitamin D status are warranted.

**Keywords:** Exercise, Physical Activity, Vitamin D



## EXPLORING ZEOLITES AS AN EFFECTIVE METHOD TO REDUCE HEAVY METAL CONTAMINATION IN WATER: A REVIEW STUDY

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**Background and Aim:** Water pollution with heavy metals due to biological, chemical, and physical processes by human activities, which are caused by the waste of agriculture, animal husbandry, mines, industry, household waste, and urban runoff, causes serious problems for public health, including various types of cancers. Heavy metals can be removed from water by different methods. One of these is absorption by zeolites.

**Methods:** A comprehensive literature search was conducted using PubMed, Google Scholar, and Web of Science databases. The search was limited to articles published in English between 2000 and 2023. Due to the inclusion and exclusion criteria a total of 80 articles were selected.

**Results:** According to this study, heavy metals are constantly released into the water from several sources. The unfavorable effects of heavy metal accumulation due to non-biodegradation require using methods to remove heavy metals from water. Various methods of reducing the concentration of heavy metals, such as coagulation/flocculation, ion exchange, flotation, membrane filtration, chemical precipitation, electrochemical purification, and absorption, are used. To achieve the desired performance, choosing the most practical method based on the cost and concentration of heavy metals is necessary.

**Conclusion:** Zeolites, as one of the cost-effective, remove heavy metal ions from water due to their porous structure. The presence of impurities and negative charges on the surface of natural zeolites prevents their optimal absorption capacity. One of the methods that can be used to achieve more wastewater treatment by zeolites is to modify their structure.

**Keywords:** Zeolite, Water pollution, Health



## ARSENIC IN RICE

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**Background and Aim:** Arsenic as a heavy metal is a serious threat to the environment and human health. Rice is one of the most important ways for arsenic to enter the human food chain.

**Methods:** A comprehensive literature search was conducted using databases such as PubMed, Scopus, Google Scholar, and Web of Science. The search was limited to articles published in English between 2000 and 2023. The keywords used for the search included "Arsenic," "Rice" and "food security,". Due to the inclusion and exclusion criteria a total of 31 articles were selected.

**Results:** Various strategies to determine the practical method to reduce arsenic uptake and accumulation in paddy plants. The latest developments in arsenic mitigation technologies with an emphasis on the application of seed modification to limit arsenic accumulation in rice grains. Different irrigation techniques by changing water management practices. Biological and nano-modification of rice seeds. Recently, nano-sized sensors have been placed in the leaves of plants and can immediately detect the level of the heavy and highly toxic metal arsenic in the soil environment. One of the simplest methods is the effect of washing and boiling on the total content of arsenic.

**Conclusion:** The monitoring of arsenic uptake in living plants will be important for environmental monitoring and agricultural programs to protect food safety. Therefore, a national food safety system based on the Ministry of Health's laws and duties is necessary to reduce arsenic in imported rice and ensure food security and safety.

**Keywords:** Arsenic, Rice, Food safety, Food security



## EFFECT OF CURCUMIN SUPPLEMENTATION ON SYMPTOMS OF ANXIETY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Curcumin is a polyphenolic natural compound that has been used to treat various ailments such as symptoms of anxiety. However, the findings of studies regarding the anti-depressive properties of curcumin are controversial. This review aims to evaluate if there are clinical benefits of curcumin in patients with symptoms of anxiety.

**Methods:** PubMed, Embase, Web of Science, and the Cochrane Library were retrieved to collect randomized controlled trials (RCTs) from the database inception to August 16, 2023. The random-effects model was used to estimate the standard mean difference (SMD).

**Results:** A total of eight RCTs involving 567 participants were included in the analysis. A pooled analysis showed a significant effect of curcumin on anxiety symptoms (SMD: -1.56; 95% CI: -2.48, -0.64,  $p < 0.001$ ;  $I^2 = 95.6\%$ ,  $p$ -heterogeneity  $< 0.001$ ).

**Conclusion:** Present meta-analysis demonstrated that curcumin intake might contribute to alleviation of anxiety disorder. Due to the limited number of studies included, it is necessary to conduct more high-quality studies to confirm the clinical efficacy of curcumin

**Keywords:** Anxiety, Curcumin, Meta-analysis, Systematic review



## THE EFFECT OF CHAMOMILE CONSUMPTION ON LIPID PROFILE: A SYSTEMATIC REVIEW

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**Background and Aim:** Some scientific experiments and clinical studies have revealed the lipid lowering properties of chamomile, but the actual effect of chamomile consumption in reducing human serum lipids is still not clear. The aim of this systematic review is to evaluate the effect of chamomile consumption on human serum lipids.

**Methods:** In this review article, we performed an electronic search in the Web of Science, PubMed [including MEDLINE], Cochrane Library, Scopus, and Embase to identify eligible articles published up to December 2023. The following keywords were used in the search strategy: "lipid profile" OR "Cholesterol" OR "low-density lipoprotein" OR "high-density lipoprotein" OR "triglyceride" AND "chamomile". The references of retrieved items were also searched to identify additional articles about this topic.

**Results:** A total of 240 studies were retrieved during the search process, but seven trials were included to this review. The total sample size was 389 of which 212 participants were female. Various forms of chamomile were used such as tea, capsule and syrup. In most evaluated studies, there was a positive association between chamomile consumption and lipid profile reduction; such as cholesterol and triglyceride.

**Conclusion:** The present review demonstrates that chamomile can elicit significant reductions in serum TC and Tg, but not HDL-C and LDL-C in adults. Moreover, further large-scale and well-designed RCTs are required to confirm the veracity of these findings.

**Keywords:** lipid profile, Cholesterol; low-density lipoprotein; high-density lipoprotein; triglyceride; chamomile



## EFFECT OF SILYMARIN ON LIPID PROFILE AND GLYCEMIC CONTROL IN PATIENTS WITH TYPE 2 DIABETES MELLITUS.

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**Background and Aim:** This randomized clinical trial was conducted to evaluate the effects of silymarin supplementation on glycemic indices and serum lipid profile in type 2 diabetes mellitus (T2DM) patients.

**Methods:** In this single-blind randomized clinical trial study, 48 patients with T2DM were eligible to participate for 12 weeks, and were divided into two groups randomly: 24 subjects in the intervention (received three 140 mg Silymarin capsules daily and diet plan) and 24 in control (received a diet plan). Fasting blood samples and anthropometric data were collected, and glycemic indices and lipid profiles were determined at baseline, and at the end of the study.

**Results:** Out of 60 patients included in the clinical trial, 48 people completed the study. In comparing Silymarin and control groups before and after the study, a significant reduction was observed in weight and BMI. However, after adjustment, no significant difference was seen between the two groups. Furthermore, daily consumption of three capsules of 140 mg Silymarin for 12 weeks did not show any significant difference on the level of fasting blood sugar (FBS) ( $P=0.789$ ), HbA1c ( $P=0.719$ ), and lipid profile.

**Conclusion:** The findings of the present study show that Silymarin did not lead to changes in the level of glycemic index and lipid profile in patients with T2DM

**Keywords:** Type 2 diabetes, FBS, HbA1c, lipid profile, Silymarin



## EXPLORING THE RELATIONSHIP BETWEEN CONSUMPTION OF DAIRY PRODUCTS AND ANXIETY: RESULTS OF A CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Anxiety disorders are a significant global health concern, affecting individuals from diverse demographic groups. As anxiety disorders increase globally, understanding dietary factors, especially dairy intake, is crucial for developing holistic approaches to mental well-being. This study aimed to investigate the relationship between dairy consumption and anxiety.

**Methods:** This cross-sectional study was conducted on 604 nutrition science students and their families aged 18-65 years (mean age = 33.8). Dietary data were collected using a validated semi-quantitative food frequency questionnaire with 168 food items. Anxiety was measured by the DASS-21 questionnaire. To investigate the relationship between dairy consumption and anxiety, logistic regression analysis was used in crude and adjusted models.

**Results:** There was no significant association between dairy product consumption and anxiety (OR = 1.312; 95% CI = 0.801-2.147; P = 0.281) in the crude model. This association remained not significant after adjusting for potential confounding variables including of age, gender, Body mass index (BMI), smoking status, and energy intake (OR = 1.096; 95% CI = 0.620-1.937; P = 0.754).

**Conclusion:** This study found no significant evidence to support the association between consuming dairy products and anxiety. Further studies should explore the potential mechanisms underlying this association and consider the broader implications for mental health interventions.

**Keywords:** Anxiety; Dairy consumption; Cross-sectional; IRAN



## ASSOCIATION BETWEEN DAIRY INTAKE AND DEPRESSIVE SYMPTOMS: FINDINGS FROM A POPULATION-BASED CROSS-SECTIONAL STUDY

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**Background and Aim:** Mental health disorders, especially depression, are major causes of disability and disease worldwide. Dairy products contain nutrients that may benefit mental health. However, there is little research on their association with depression. Therefore, this study aimed to assess the associations between dairy products and depression.

**Methods:** This cross-sectional study was conducted on 604 adults aged 18 to 65 years (mean age: 33.8 years), who participated from different regions of Iran. Data on dietary intakes of dairy products were obtained using a validated Food Frequency Questionnaire. Depression symptoms was assessed by the Iranian validated short version of the self-reported questionnaire (Depression Anxiety Stress Scales 21 [DASS21]). To analyze the association between dairy intake and depression in crude and adjusted models, multivariable logistic regression analysis was performed.

**Results:** There was no significant association between the consumption of dairy products and depression (OR = 1.053; 95% CI 0.644-1.723; P-Value = 0.836) in the crude model. This association remained not significant after adjustments for potential confounders including age, gender, smoking cigarette, BMI (Body Mass Index) and total Kcal (OR = 1.049; 95% CI 0.595-1.849; P-Value = 0.868). However, higher intake of dairy, in both crude and adjusted models, was related to a slightly greater odds of depression.

**Conclusion:** We did not find any significant relationship between depression and intake of dairy products. Further studies are needed to confirm these findings.

**Keywords:** Depression; Cross-sectional; Dairy Products; Iran.





## THE ASSOCIATION BETWEEN THE ADDING SALT TO FOOD AND EXCESSIVE DAYTIME SLEEPINESS AMONG ADULTS: RESULTS OF CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Excessive daytime sleepiness (EDS) is a major public health issue that involves both difficulty staying awake during the day and a general sense of sleepiness. Diet, dietary components, and nutrients have been shown to affect EDS. This study aims to explore the relationship between adding salt to food and EDS.

**Methods:** This cross-sectional study involved 604 adults aged 18 to 65 from different regions of Iran. We used a standard questionnaire to measure meal regularity and salt intake. We used a Persian translation of the Epworth Sleepiness Scale (ESS) to assess EDS. We used logistic regression to examine the relationship between salt intake and EDS in crude and adjusted models.

**Results:** The odds of sleepiness were not significantly different between people who mostly adding salt to food and who do not it (OR = 2.58; 95% CI= 0.90-7.37; P = 0.07) in the crude model. This association was not significant after adjusting for potential confounding variables (OR = 2.35; 95% CI= 0.70-7.80; P = 0.16). There was no significant association between the adding salt to food and excessive daytime sleepiness in crude and adjusted model.

**Conclusion:** Our results showed that salt intake was not significantly related to EDS. Prospective studies are needed for more investigation.

**Keywords:** adding salt to food, sleepiness, Iran, cross-sectional



## THE ASSOCIATION BETWEEN THE CONSUMPTION OF ULTRA-PROCESSED FOODS AND DEPRESSION AND STRESS

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**Background and Aim:** Psychological disorders are a serious problem that threatens the quality of life. Psychological disorders is related to diet quality, nutrients and Food groups. Consumption of ultra-processed foods, which are rich in saturated and trans fatty acids, added sugar and salt, have a detrimental effect on the pathophysiological pathways associated with depression and stress. The aim of this study is to investigate the relationship between the consumption of UPF and depression and stress.

**Methods:** 604 adults aged 18 to 65 from different regions of Iran participated in this study. An Iranian validated short version of a self-reported questionnaire (Depression Anxiety Stress Scales 21 [DASS21]) used to assess depression and stress score and The intake of food groups was assessed by a valid and reliable food frequency questionnaire (FFQ). To investigate the relationship between the consumption of UPF and depression and stress, logistic regression was used in crude and adjusted models.

**Results:** In the crude model, there was no significant relationship in the odds of depression and stress in people who were in the highest tertile of ultra-processed food consumption compared to those who were in the lowest tertile of consumption. (OR:0.97; 95% CI, CI:0.59–1.58, P: 0.91) (OR:1.18; 95% CI, CI:0.65–2.16, P: 0.57). This association remained non-significant after adjusting for confounding variables (OR:0.77; 95% CI, CI:0.42–1.41, P:0.41) (OR:1.00; 95% CI, CI:0.48–2.05, P: 0.99).

**Conclusion:** No significant association between the consumption of ultra-processed foods and depression and stress was seen in the crude and adjusted model. Prospective studies are needed to confirm these findings.

**Keywords:** ultra-processed foods, UPF, Iran, depression, stress, cross-sectional



## THE ROLE OF FUNCTIONAL FOODS IN THE MANAGEMENT OF MULTIPLE SCLEROSIS: A SYSTEMATIC REVIEW

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**Background and Aim:** Multiple sclerosis (MS) is a chronic inflammatory autoimmune disease that affects the brain and spinal cord, causing a range of symptoms such as fatigue, muscle weakness, and problems with coordination and balance. There is no cure for MS but various treatment options are available to manage symptoms or slow down disease progression. In recent years, there has been growing interest in the role of functional foods in supporting the management of MS.

**Methods:** Multiple databases including PubMed, Scopus, and Web of Science as well as Google Scholar search engine were searched using appropriate keywords up to December 2023. The keywords used were “nutraceuticals” or “supplements” or “functional foods” and “multiple sclerosis” or “MS”.

**Results:** Ginger may be beneficial for MS patients due to its anti-inflammatory, neuroprotective, immunomodulatory, and anti-oxidative properties. Turmeric is another functional food that may modulate cell cycle regulatory proteins, transcription factors, enzymes, and cytokines in MS. In addition, probiotics and synbiotics have shown favorable effects on the recovery of MS by inhibiting T-cell infiltration into the central nervous system through regulating gut dysbiosis. Moreover, some other functional foods such as saffron, cinnamon, ginseng, and black cumin have indicated promising results in the improvement of MS symptoms.

**Conclusion:** Multiple functional foods such as ginger, turmeric, probiotics, synbiotics, saffron, cinnamon, ginseng, and black cumin have shown positive effects in the management of MS and its complications in animal and human studies. However, there is an ongoing need for approving these effects by conducting more studies.

**Keywords:** Functional Foods; Multiple Sclerosis; Systematic Review



## EFFECT OF CURCUMIN SUPPLEMENTATION ON SYMPTOMS OF ANXIETY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Curcumin is a polyphenolic natural compound that has been used to treat various ailments such as symptoms of anxiety. However, the findings of studies regarding the anti-depressive properties of curcumin are controversial. This review aims to evaluate if there are clinical benefits of curcumin in patients with symptoms of anxiety

**Methods:** PubMed, Embase, Web of Science, and the Cochrane Library were retrieved to collect randomized controlled trials (RCTs) from the database inception to August 16, 2023. The random-effects model was used to estimate the standard mean difference (SMD).

**Results:** A total of eight RCTs involving 567 participants were included in the analysis. A pooled analysis showed a significant effect of curcumin on anxiety symptoms (SMD: -1.56; 95% CI: -2.48, -0.64,  $p < 0.001$ ;  $I^2 = 95.6\%$ ,  $p$ -heterogeneity  $< 0.001$ ).

**Conclusion:** Present meta-analysis demonstrated that curcumin intake might contribute to alleviation of anxiety disorder. Due to the limited number of studies included, it is necessary to conduct more high-quality studies to confirm the clinical efficacy of curcumin

**Keywords:** Anxiety, Curcumin, Meta-analysis, Systematic review



## THE ASSOCIATION BETWEEN PLANT-BASED DIETS AND ANXIETY SYMPTOMS: FINDINGS FROM A POPULATION-BASED CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Anxiety is a mental health disorder that can be affected by diet. Still, it has an unclear association with plant-based diet (PDI). Since little data is available on the associations between PDI and anxiety, we aimed to explore the relationship between PDI, related indices with anxiety.

**Methods:** We conducted a cross-sectional study in Iran to examine the association between PDI and anxiety among 604 adults aged 18 to 65 years. A validated Food Frequency Questionnaire (FFQ) was used to collect dietary data. Anxiety symptoms was assessed by the Iranian validated short version of the self-reported questionnaire (Depression Anxiety Stress Scales 21 [DASS21]). To analyze the association between PDI, h&uPDI with depression in crude and adjusted models, multivariable logistic regression analysis was performed.

**Results:** Our results showed that a higher score on the healthy plant-based dietary index (hPDI) was associated with lower odds of anxiety (OR= 0.408; 95% CI 0.246-0.678; P-value= 0.001). This association remained significant after adjusting for potential confounders (OR= 0.446; 95% CI 0.246-0.807; P-value= 0.008). However, we did not find any significant association between the plant-based dietary index (PDI) or the unhealthy plant-based dietary index (uPDI) and anxiety.

**Conclusion:** Our study suggests hPDI may reduce the odds of anxiety, however this relationship was not found with PDI and uPDI. However, due to the substantial variation in the methodological quality, validity of interpretation, and confidence in results of the existing studies, further research is needed to clarify the associations between plant-based diet and anxiety.

**Keywords:** anxiety, plant-based diet, vegan, vegetarian, mental health, Iran.



## EFFECT OF SIMULTANEOUS ADMINISTRATION OF ACETIC ACID AND BUTYRIC ACID ON INSULIN PARAMETERS IN RATS.

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**Background and Aim:** In diabetes mellitus, hyperglycemia, insulin resistance, and inflammation are increased, and the created oxidative stress causes progressive destruction of beta cell function. The aim of this study was to investigate the effect of simultaneous administration of acetic acid and butyric acid on insulin parameters in rats

**Methods:** After preparing the mice and ensuring their health, we divided them into 5 groups of 6. Diabetes was induced by injecting the drug streptozocin to the mice (except for the negative control group) and then they were prescribed acetic acid, butyric acid and their mixture, except for the 2 control groups. Weighing and blood sugar measurement were done. After glucose injection, blood sugar and insulin were measured at intervals of 30, 60, 90, and 120 minutes, and indices were calculated and statistical analyzes were performed.

**Results:** The findings of the present study showed that the simultaneous administration of acetic acid and butyric acid to mice compared to their separate administration had no advantage in terms of improving blood sugar levels, plasma insulin levels and insulin resistance indices. But it caused the treated rats to lose less weight than the acetic acid and butyric acid groups.

**Conclusion:** Short-chain fatty acids can have a beneficial effect on the improvement of diabetes in mice, and human studies should be expanded in this regard. Diabetes mellitus, insulin, short chain fatty acids.

**Keywords:** Diabetes mellitus; insulin; short chain fatty acids; Rats



## EFFECT OF ACETATE ON INSULIN RESISTANCE INDICES IN DIABETIC RATS

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**Background and Aim:** Acetate is an endogenous metabolite resulting from beta oxidation of fatty acids, which is produced in liver mitochondria under starvation conditions. Acetate is formed in the liver and enters the bloodstream and is used as a biological fuel in extra hepatic tissues in starvation conditions. The aim of this study was to investigate the Effect of acetate administration on insulin resistance indices in mice.

**Methods:** In this research, 30 mice were purchased and transferred to the place where laboratory animals are kept. We injected streptozotocin 30 mg/kg intra peritoneal for all animals, except for the negative control group. Then they were given acetic acid (except for control groups). After glucose injection, blood sugar was measured at intervals of 30, 60, 90 and 120 minutes. After insulin measurement, insulin resistance index and insulin sensitivity index were calculated. The HOMA-IR index was used to determine insulin resistance. QUICKI index was also used to determine insulin sensitivity. The resulting data will be analyzed with a completely random design model using SAS 9.1 software, general linear model procedure, and then mean comparison will be done with Duncan's post hoc test.

**Results:** In the present study, the administration of acetate decreased the average blood sugar and increased the plasma insulin level in rats, but it did not have a beneficial effect on insulin resistance indices (Quikl and HOMA-IR).

**Conclusion:** More studies are needed to reach a definitive opinion about the effect of acetate in diabetics.

**Keywords:** acetate; diabetic; Mice; insulin resistance



## THE EFFECTS OF SHORT-CHAIN FATTY ACID-BUTYRATE SUPPLEMENTATION ON THE SLEEP AND LIFE QUALITY IN PATIENTS WITH ACTIVE ULCERATIVE COLITIS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Ulcerative colitis (UC) patients often experience poor sleep and life quality. Butyrate, a short-chain fatty acid (SCFA), has been found to be effective in improving sleep and life quality through its impact on modulating circadian clock genes, mitigate inflammation and restore balance in the gut microbiota. This study aimed to explore the impact of sodium butyrate supplementation on the sleep and life quality in individuals with active UC.

**Methods:** In this recent randomized controlled trial, 36 individuals diagnosed with active UC were randomly allocated to receive either sodium butyrate (600 mg/kg) or a placebo for a period of 12 weeks. Ethical approval for this study was obtained from the Research Ethics Committee of Shiraz University of Medical Sciences (reference number: IR.SUMS.SCHEANUT.REC.1400.037). To assess sleep quality over the past month and patients' quality of life (QoL), the Persian version of the Pittsburgh Sleep Quality Index (PSQI) and the Inflammatory Bowel Disease Questionnaire-9 (IBDQ-9) were respectively utilized at baseline and end of study through face-to-face interviews.

**Results:** The between-group analysis showed a significant decrease ( $p$ -value  $< 0.001$ ) in the PSQI score and a significant improvement in the IBDQ parameters' scores, including intestinal ( $p$ -value  $< 0.001$ ), systemic ( $p$ -value  $< 0.001$ ), social ( $p$ -value = 0.005), emotional ( $p$ -value = 0.001) function, and total ( $p$ -value  $< 0.001$ ) among the butyrate group compared to the placebo group through the 12-weeks treatment intervention.

**Conclusion:** Butyrate may be an effective adjunct treatment for improving sleep and life quality in active UC patients.

**Keywords:** Short-chain fatty acids; Butyrate; Sleep; Life quality; Ulcerative colitis





## STUDY OF THE RELATIONSHIP BETWEEN ANTHROPOMETRIC INDICES AND THE STATUS OF SPERM IN INFERTILE MEN REFERRED TO IVF CENTER OF FATEMIEH HOSPITAL, HAMEDAN

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**Background and Aim:** Infertility is one of the most common problems in today's societies. Lifestyle factors, such as weight and nutritional status may affect male fertility. The objective of this Study was to evaluate the relationship between anthropometric indices and the status of sperm in infertile men.

**Methods:** 350 infertile men participated in this cross-sectional study. demographic and anthropometric data (weight, height), body fat percentage, and sperm parameters were collected. SPSS.16.5 software was used for statistical analysis. In order to compare quantitative traits, such as sperm, at different levels of BMI and body fat percentage, the Pearson correlation test, ANOVA and T- test were also used.

**Results:** In terms of body mass index, 12% of subjects had reduced weight, 3/36% normal weight, 6/40% overweight and 1/11% of them were obese. The highest rates of participants (51/7%) were above normal weight. The average fat content was 17/63 %. The highest sperm count was observed in people with normal fat mass percentage and in those with fat mass lower than normal, the sperm count was low.

**Conclusion:** There was no statistically significant correlation between BMI and fat mass percentage with sperm indices, but given to the relation between fat mass percentage and sperm count in males in our study, it is necessary to encourage them to do physical activity, manage of weight and use proper nutrition.

**Keywords:** anthropometric; body mass index; sperm; infertility



## THE EFFECT OF FOLATE RECEPTOR-A EXPRESSION ON SOME PATHOLOGICAL PERSPECTIVES OF BREAST CANCER: A META-ANALYSIS

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**Background and Aim:** The Estrogen Receptor (ER), Progesterone Receptor (PR) and human epidermal growth factor receptor 2 (Her2) expression status of breast cancer cells are the main biomarkers in determining prognosis in breast cancer patients. Moreover, it has been shown that folate receptor-alpha (FR $\alpha$ ) is overexpressed in breast tumors. Thus, the aim of this meta-analysis study is to evaluate some pathological features of breast cancer tissue among FR+ and FR- cases.

**Methods:** The literature search was performed through the PubMed and Embase databases up to December 2023. The association between FR expression with hormonal receptor status and pathological features of breast cancer was measured by ORs with 95% confidence intervals (CIs) using the random-effects model.

**Results:** Finally, 7 studies were eligible for including in the meta-analysis. FR positive expression was significantly associated with lower expression of ER and PR (OR= 0.16; 95% CI: 0.05-0.51; P=0.002; I<sup>2</sup>= 76.9%; P=0.001 and OR=0.11; 95% CI: 0.07-0.18; P<0.001; I<sup>2</sup>= 66.3%; P=0.031, respectively). Unlikely, FR expression was not associated with HER2 status (OR=0.74; 95% CI: 0.42-1.32; P=0.31; I<sup>2</sup>= 60%; P=0.057). There was no significant association between nodal status (OR=1.03; 95% CI: 0.7-1.5; P=0.897; I<sup>2</sup>= 21.3%; P=0.273), tumor size (OR=1.2; 95% CI: 0.83-1.75; P=0.334; I<sup>2</sup>= 75%; P=0.007) and FR expression. On the other hand, FR positive status was associated with high histological grade (II and III) in breast cancer patients (OR=3.33; 95% CI: 1.93-5.74, P<0.001; I<sup>2</sup>= 0.0%; P=0.419).

**Conclusion:** FR higher expression is associated with lower ER and PR expression and high histological grade in patients with non-metastatic breast cancer.

**Keywords:** Folate receptor; Pathology; Breast Neoplasms



## THE EFFECTS OF SHORT-CHAIN FATTY ACID-BUTYRATE SUPPLEMENTATION ON THE EXPRESSION OF CRYPTOCHROME 1 AND 2 GENES IN PATIENTS WITH ACTIVE ULCERATIVE COLITIS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Butyrate, a short-chain fatty acid, is being suggested as effective in managing ulcerative colitis (UC), particularly in regulating circadian-clock genes, which are downregulated in UC, a key focus in understanding UC's etiology. The aim of this study was to examine the impact of sodium butyrate supplementation for the first time on the expression of circadian-clock genes including two cryptochrome genes, CRY1 and CRY2 in patients with active UC.

**Methods:** The current randomized controlled trial involved 36 active UC patients being random-distributed into sodium butyrate (600 mg/kg) or placebo for a 12-week period. Before enrolling the first participant, the study received ethical approval from the Research Ethics Committee of Shiraz University of Medical Sciences (reference number: IR.SUMS.SCHEANUT.REC.1400.037) in October 2021. The expression of circadian clock genes (CRY1 and CRY2) were assessed by real time polymerase chain reaction (qPCR) from white blood cells (WBC). Gene expression changes were presented as fold changes in expression ( $2^{-\Delta\Delta CT}$ ) relative to the baseline, which was normalized to  $\beta$ -actin as the reference gene. The data were analyzed using SPSS version 23. An independent sample t-test was employed for comparison between groups. A p-value of  $\leq 0.05$  was used to determine statistical significance.

**Results:** The results showed that butyrate supplementation in comparison with placebo significantly upregulated the fold change expression of CRY1 (2.22 (1.59) vs. 0.63 (0.49), p-value < 0.001) and CRY2 (2.15 (1.26) vs. 0.93 (0.80), p-value= 0.001).

**Conclusion:** Supplementation of butyrate, in conjunction with regular medication may be an effective treatment in the upregulation of circadian clock genes in active UC patients.

**Keywords:** Short-chain fatty acids; Butyrate; Circadian-clock genes; Ulcerative colitis



## CURCUMIN AND INFLAMMATORY BOWEL DISEASES: FROM IN VITRO STUDIES TO CLINICAL TRIALS

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**Background and Aim:** we summarized various pre-clinical and clinical studies on curcumin in IBDs

**Methods:** Inflammatory bowel diseases (IBDs) may result from mutations in genes encoding for innate immunity, which can lead to exacerbated inflammatory response. Although some mono-targeted treatments have developed in recent years, IBDs are caused through several pathway perturbations. Therefore, targeting all these pathways is difficult to be achieved by a single agent. Moreover, those mono-targeted therapies are usually expensive and may cause side-effects. These limitations highlight the significance of an available, inexpensive and multi-targeted dietary agents or natural compounds for the treatment and prevention of IBDs. Curcumin is a multi-functional phenolic compound that is known for its anti-inflammatory and immunomodulatory properties. Over the past decades, mounting experimental investigations have revealed the therapeutic potential of curcumin against a broad spectrum of inflammatory diseases including IBDs. Furthermore, it has been reported that curcumin directly interacts with many signaling mediators implicated in the pathogenesis of IBDs. These preclinical findings have created a solid basis for the assessment of the efficacy of curcumin in clinical practice. In clinical trials, different dosages e.g., 550 mg /three times daily-1 month, and 1 g /twice times daily-6month of curcumin were used for patients with IBDs.

**Conclusion:** Taken together, these findings indicated that curcumin could be employed as a therapeutic candidate in the treatment of IBDs. Moreover, it seems that overcome to current limitations of curcumin i.e., poor oral bioavailability, and poor oral absorption with using nanotechnology and others, could improve the efficacy of curcumin both in pre-clinical and clinical studies.

**Keywords:** Inflammatory bowel disease Curcumin Herbal compound Anti-inflammation Disease therapy



## NUTRACEUTICALS TO PREVENT POSTPARTUM DEPRESSION IN ADOLESCENTS: A SYSTEMATIC REVIEW

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**Background and Aim:** Postpartum depression (PPD) is a common and debilitating mental health disorder that affects many new mothers, including adolescents. While various factors such as hormonal and physiological changes contribute to PPD, emerging research suggests that nutraceuticals may play a crucial role in preventing its onset. This review aims to highlight key nutraceuticals that may be beneficial in this regard.

**Methods:** Multiple databases including PubMed, Scopus, and Web of Science as well as Google Scholar search engine were searched using appropriate keywords up to September 2023. The keywords used were “nutraceutical” or “supplement” or “nutrient” and “postpartum depression” or “PPD” and “adolescents” or “youth” or “teenagers”.

**Results:** Studies have suggested that supplementing with omega-3 fatty acids during pregnancy and postpartum has been linked to improved mood regulation and lower risk of developing PPD. Also, iron supplementation in the postpartum period may decrease the risk of PPD. Moreover, a significant negative association has been found between high selenium intake and the risk of PPD. In addition, studies have shown an association between low prenatal vitamin D levels and an increased risk of PPD. Furthermore, depletion in vitamin B stores and their non-recovery after childbirth have been indicated to increase the risk of developing PPD. Also, emerging evidence suggests that probiotic supplementation during pregnancy may contribute to a healthier mental state postpartum.

**Conclusion:** Supplementation with omega-3 fatty acids, iron, selenium, vitamin D, vitamin B, and probiotics may help prevent or alleviate symptoms of PPD in adolescents.

**Keywords:** Adolescents; Nutraceuticals; Postpartum Depression; Systematic Review



## COMPARISON OF THE CONSUMPTION COST OF HEALTHY AND UNHEALTHY HOUSEHOLD FOODS BETWEEN THE LIVELIHOOD DECILES IN IRAN.

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**Background and Aim:** Comparison of the consumption cost of healthy and unhealthy household foods between the livelihood deciles of the Iran.

**Methods:** The necessary data for this study were extracted from the database of Iran Statistics Center. In the following report, the consumption cost of healthy and unhealthy household foods was compared between the livelihood deciles of the country in 2017 based on the cost and income index of urban and rural households.

**Results:** The division of healthy and unhealthy foods and drinks was based on national standards and the examples of the final list of goods and actions harmful to health of the Ministry of Health, Treatment and Medical Education. The average cost of healthy and unhealthy food consumption in the lower income deciles has a significant difference compared to the upper deciles. For example, the average cost of healthy food consumption in the first decile is 2060978 Rials, while in the tenth decile, this number is 12343643 Rials. The average share of unhealthy food items to the total cost in urban areas, in decile 1, is the highest compared to other deciles. While in the 9th and 10th deciles, the average share of unhealthy food items to the total cost is the lowest. In rural households, the average share of unhealthy food items to the total cost in decile 1 is the highest compared to other deciles.

**Conclusion:** This research showed that the consumption of unhealthy foods in the lower deciles of income is more than in the upper deciles.

**Keywords:** unhealthy foods; healthy foods; Iran; Cost



## ANTIOXIDANT SUPPLEMENTATION FOR ATHLETES: A SYSTEMATIC REVIEW

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**Background and Aim:** Many athletes use antioxidant supplements as a potential solution to counteract the production of reactive oxygen species (ROS). This review article explores the benefits, risks, and considerations surrounding antioxidant supplementation in athletes.

**Methods:** Multiple databases including PubMed, Scopus, and Web of Science as well as Google Scholar search engine were searched using appropriate keywords up to the middle of 2023. The keywords used were "antioxidant" or "antioxidants" and "athlete" or "athletes".

**Results:** Intense exercise increases oxidative stress on the body. Antioxidant supplementation may aid in reducing muscle damage caused by exercise-induced ROS production, leading to faster recovery times. In addition, intense training can temporarily suppress the immune system, making athletes more susceptible to infections. Antioxidants help support immune function by reducing oxidative stress. Moreover, exercise-induced inflammation can hinder performance and delay recovery. Antioxidants may help mitigate inflammation by neutralizing free radicals. The effectiveness of antioxidant supplementation depends on the dosage used. Too low a dose may not provide any benefits while excessive doses could potentially have adverse effects. Timing is also crucial when it comes to antioxidant supplementation for athletes. Consuming antioxidants immediately before or after exercise may interfere with the body's natural adaptive response to exercise-induced oxidative stress. Furthermore, athletes have different physiological responses to antioxidants due to genetic variations or training adaptations. What works for one athlete may not work for another, emphasizing the importance of personalized approaches.

**Conclusion:** When used appropriately, antioxidant supplementation can help reduce oxidative stress and inflammation, enhance recovery, optimize performance, and support immune function in athletes.

**Keywords:** Antioxidants; Athletes; Oxidative Stress; Systematic Review



## THE EFFECT OF NIGELLA SATIVA ON SERUM LEVELS OF INSULIN-LIKE GROWTH FACTOR AND ITS BINDING PROTEINS IN POSTMENOPAUSAL WOMEN WITH LOW BONE DENSITY: A TRIPLE-BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Animal studies have shown that *Nigella sativa* (NS) seed oil can increase Insulin-like growth factor (IGF-1) serum levels. This study aimed to investigate the effect of oral capsule NS on serum levels of IGF-1 and its binding proteins (IGFBP-1, IGFBP-3) in postmenopausal women with bone loss density.

**Methods:** Sixty postmenopausal women of 50 to 65 years with bone loss density randomly received a soft capsule of NS oil 1000 mg or placebo once daily for six months with a 1:1 allocation ratio. DEXA method was used to measure bone density. Serum concentrations of IGF-1, IGFBP-1 and -3, ALT, AST, ALP, Cr, and urea were measured at baseline and after the intervention.

**Results:** There were no significant differences in serum levels of IGF-1, IGFBP-1, urea, Cr, ALT, AST, and ALP between the two groups at the end of six months. However, a significant increase has been shown in IGFBP-3 between groups after the intervention (Adjusted mean difference: 95% CI: 1.65:0.36 to 2.97;  $p=0.013$ ).

**Conclusion:** We observed a significant increase in IGFBP-3 serum levels without any side effects. Additional research with an increased number of participants may be needed for further clarification of its beneficial anabolic effects on the GH system.

**Keywords:** IGF-1, IGFBPs, Menopause, *Nigella sativa*, Osteopenia, Osteoporosis





## THE EFFECT OF WHEY PROTEIN ON INFLAMMATORY FACTORS AND OXIDATIVE STRESS IN ADULTS WITH CHRONIC DISEASES: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CONTROLLED CLINICAL TRIALS

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**Background and Aim:** Chronic illnesses such as diabetes, cardiovascular disorders, and cancer have been associated with persistent inflammation and oxidative stress. Whey protein, a byproduct of cheese production, possesses anti-inflammatory and antioxidant properties. The purpose of this comprehensive investigation and meta-analysis was to examine the impact of whey protein supplementation on inflammatory markers and oxidative stress in adults with chronic illnesses.

**Methods:** We conducted a comprehensive exploration across a range of electronic repositories, including PubMed, EMBASE, Cochrane Library, and Web of Science. Our scope encompassed studies released until March 2022, with a specific emphasis on randomized controlled trials (RCTs). A total of 15 randomized controlled trials (RCTs) were scrutinized for our ultimate evaluation.

**Results:** The addition of whey protein to the diet had a significant effect in reducing C-reactive protein (CRP) levels (P value = 0.04). However, it did not have a significant impact on the levels of IL-6, TNF- $\alpha$ , GSH, and MDA. The studies demonstrated moderate heterogeneity in all outcomes (I<sup>2</sup> = 52%–68%). Further analysis revealed that the reduction in CRP levels was more pronounced in studies with longer intervention periods (12 weeks) and higher doses of whey protein (50 g/day).

**Conclusion:** Based on the findings of this meta-analysis, it can be concluded that incorporating whey protein supplementation in the diet may provide potential benefits in reducing CRP levels. However, it does not appear to have a significant effect on other markers of inflammation and oxidative stress.

**Keywords:** whey protein, Inflammatory factors, oxidative stress, systematic review, meta-analysis



## THE ASSOCIATION BETWEEN DIETARY INFLAMMATORY INDEX AND SERUM INFLAMMATORY BIOMARKERS IN WOMEN WITH GALLSTONE: A CASE-CONTROL STUDY

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**Background and Aim:** One of the most prevalent gastrointestinal tract disorders is gallstone. Considering inflammation as a primary occurrence in gallstone formation, the object of the current study was to assess the association between Dietary Inflammatory Index (DII) and serum inflammatory biomarkers in women with gallstone.

**Methods:** This sex and BMI-matched case-control study was conducted on a sample of 75 women diagnosed with gallstone and 75 healthy women at the Gastroenterology and Hepatology Clinic of Shahid Beheshti University of Medical Science in Tehran, Iran. This study was approved by the Ethical Committee of the Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran (research ethics number: IR.TBZMED.REC.1398.1202). All eligible subjects completed the written informed consent form. The characteristics of participants were collected using a general information questionnaire. To measure serum parameters, blood samples were collected from all participants after 12 hours of fasting. Linear regression was employed to assess the association between DII with the serum inflammatory biomarkers (hs-CRP and malondialdehyde).

**Results:** The mean serum levels of hs-CRP ( $P < 0.001$ ) and malondialdehyde ( $P < 0.001$ ), were significantly higher in gallstone patients compared to control subjects. The DII score was linearly associated with serum inflammatory biomarkers. The analysis revealed that DII score is associated with higher serum levels of hs-CRP and malondialdehyde ( $P < 0.001$ ).

**Conclusion:** Our information indicates that higher DII scores are related to higher serum inflammatory biomarkers in women with gallstone.

**Keywords:** Gallstone, Inflammation, Dietary inflammatory index



## ASSOCIATION OF EMPIRICALLY DERIVED FOOD-BASED INFLAMMATORY POTENTIAL OF THE DIET AND BREAST CANCER: A HOSPITAL CASE-CONTROL STUDY

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**Background and Aim:** Diet may be a modifiable factor in the prevention of breast cancer (BC) by modulating inflammation. We used a food-based empirical dietary inflammatory index (FDII) to evaluate the association between FDII and odds of breast cancer in Iranian women.

**Methods:** The present case-control study carried out on 150 age-matched women with newly diagnosed breast cancer and controls. Data for dietary intake and anthropometric measures were collected. FDII score was developed according to participants dietary intakes of 27 pre-defined food groups. Multivariate odds ratios (OR) with 95% confidence intervals (CI) were used to investigate the association of empirically derived food-based inflammatory potential of the diet and breast cancer.

**Results:** The odds ratios of BC according to quartiles of FDII score by multivariate logistic regression models indicated the FDII score was significantly associated with BC risk (OR: 2.38; 95% CI: 1.23- 4.59, P trend =0.04). After controlling confounders, multivariate logistic regressions remained significant which revealed in participants at the fourth quartile of FDII score chance of breast cancer was 2.8 times higher than participants in the first quartile

**Conclusion:** The results of our study suggested that more pro-inflammatory diet (higher FDII scores) was associated with increased BC risk. These findings suggest that developing an effective dietary modification based on FDII may reduce risk of BC.

**Keywords:** Food-based dietary inflammatory index; FDII; Dietary inflammatory index; diet; inflammation; breast cancer; cancer



## THE EFFECT OF VITAMIN D SUPPLEMENTATION ON DEPRESSION: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Uncertainty persists regarding the impact of vitamin D supplementation on adult depressive symptoms. The purpose of this study was to examine the dose-dependent effects of vitamin D supplementation on depressive and anxiety symptoms in adults.

**Methods:** We systematically searched PubMed, Scopus, and Web of Science until December 2022 for randomized controlled trials (RCTs) examining the impact of vitamin D3 supplementation on adult depression and anxiety symptoms. Using a random-effects model, we calculated the standardized mean difference (SMD) for each 1000 IU/day vitamin D3 supplementation in individual trials. Evidence certainty was assessed with the GRADE tool.

**Results:** A dose-response meta-analysis was conducted by the 30 trials consisting of 5836 people in our analysis. In both depressed and non-depressed patients, a 1000 IU/day vitamin D3 supplementation slightly decreased the severity of depression (SMD: -0.34, 95% CI: -0.46, -0.23; GRADE = moderate). In individuals with depressive symptoms, the effect was more pronounced (SMD: -0.57, 95% CI: -0.69, -0.44; n=15). The dosage of 7500 IU/day showed the greatest reduction in depression severity (SMD: -2.86, 95% CI: -5.35, -0.37). Trials with follow-up  $\geq$ 12 weeks demonstrated stronger effects (SMD: -0.53, 95% CI: -0.73, -0.33; n=18) compared to those lasting 12 to 52 weeks (SMD: -0.20, 95% CI: -0.37, -0.03; n=6) or longer than 52 weeks (SMD: 0.02, 95% CI: -0.29, 0.25; n=6). Anxiety severity was not significantly affected by vitamin D3 supplementation.

**Conclusion:** The findings suggest that Vitamin D3 supplementation may alleviate short-term depressive symptoms, but further rigorous clinical trials are warranted to definitively assess its impact on anxiety.

**Keywords:** Vitamin D3; depression; anxiety; meta-analysis; dose-response.



## NEUROLOGICAL FACTORS; THE KEY TO SUCCESS OR FAILURE IN DIETING?

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**Background and Aim:** Many factors, including genetic, environment and social environment, lead to diet failure, with neurological factors being one of the main ones. Due to the increasing prevalence of obesity and its numerous complications, it is important to examine this factor and its impact on diet failure and find solutions.

**Methods:** Searching various databases such as Pubmed, Google scholar, Scopus with keywords such as Diet failure, Weight management, Neural factors and the studies that took place between 2018 and 2023. After studying and evaluating the articles, a number of articles were selected and evaluated.

**Results:** Studies have shown that one of the neurological factors that influence diet failure is imbalance in the reward and control system. In people who fail dieting, we have a hyper-functioning reward system and a hypo-functioning control system. The low activity of the prefrontal cortex is the next factor. Given that the main activity of the prefrontal cortex is the regulation of actions, there was a decrease in the volume of gray matter in the prefrontal cortex in individuals who failed to follow the diet. Slow communication between neurons was another factor. Given that any new habit requires a new inter-neuronal pathway in the brain, the slow process leads to returning to the subconscious neuronal pathway of reinforcing the action of eating.

**Conclusion:** Attention to how habits are formed and how the brain works can lead to the Prevention of failure in the diet due to neurological factors. More studies are still needed to achieve better and more efficient solutions.

**Keywords:** Dieting; Diet failure; Weight management; Neural factors; weight loss



## OBESITY ONSET, PAST ATTEMPTS TO LOSE WEIGHT, AND WEIGHT-LOSS EXPECTATIONS IN OBESE WOMEN

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**Background and Aim:** While modest weight loss is associated with clinically meaningful risk reduction for weight-related disorders, obese seeking weight loss treatment express unrealistic expectations regarding their goals for weight loss. The greater expectations are associated with higher rates of attrition. The purpose of this study was to examine the obesity onset, past attempts to lose weight, and weight-loss expectations in obese women.

**Methods:** For this aim, 125 obese women were recruited in a nutrition clinic. The anthropometric measures were conducted and the participants completed the Goals and Relative Weights Questionnaire in the clinic prior to the initial weight loss intervention.

**Results:** The mean  $\pm$  SD age of the sample was  $27.71 \pm 7.21$  years. The majority of participants were married (72.0%). Participants' mean weight was  $85.05 \pm 11.72$  kg, and mean BMI and waist to hip were  $33.25 \pm 3.02$  kg/m<sup>2</sup> and  $0.91 \pm 0.06$ , respectively. The mean age at obesity onset was  $18.04 \pm 5.79$  years. 76% of participants had tried to lose weight and the mean age of the first attempt to lose weight was  $23.48 \pm 6.58$  years. Individual's weight loss expectations were  $19.8 \pm 8.4$  kg.

**Conclusion:** Expectations of weight loss are very high, while the actual rate of weight loss is significantly lower than expected. It seems that weight loss management and changing unrealistic weight-loss expectations are the primary challenge of obesity interventions.

**Keywords:** Obesity; Weight loss; Expectations; Onset



## ASSOCIATION OF SLEEP PATTERN AND INTAKE OF SOFT DRINKS AMONG YOUNG ADULTS

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**Background and Aim:** Dietary habits are considered a leading behavioral risk factor for human health. There is growing evidence suggesting that diet and sleep may be related. This study aimed to investigate the relationship between sleep pattern and intake of soft drinks among young adults.

**Methods:** This cross-sectional study was carried out on 250 young adults (mean age:  $19.78 \pm 3.11$  years) in Ardabil. They were invited to complete a self-administered questionnaire that collected information about a variety of behavioral risk factors. This questionnaire included frequency and quantity of soft drinks consumption. Measurements of the weight and height were done.

**Results:** The average of weight, height and sleep duration were  $64.47 \pm 12.77$  (kg),  $168.92 \pm 7.01$  (cm), and  $8.57 \pm 1.23$  hours per day. Only 65.4% had a regular sleep pattern during the week and 33% had regular consumption of soft drinks at least one or two days a week. Correlation sleep pattern and intake of soft drinks was statistically significant ( $p < 0.001$ ).

**Conclusion:** This study identified a high prevalence of soft drink consumption among young adults. These results identify young people, as population groups to target through public health interventions to had a regular sleep pattern and reduce soft drink consumption.

**Keywords:** Young adults; Sleep pattern; Soft drink



## IS THERE ANY ASSOCIATION BETWEEN DIETARY PHYTOCHEMICAL INDEX AND METABOLIC SYNDROME IN THE ELDERLY POPULATION?

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**Background and Aim:** This study aims to explore the relationship between the dietary phytochemical index and metabolic syndrome among elderly individuals.

**Methods:** In this case-control study, we randomly selected 500 elderly individuals with metabolic syndrome from the second phase of the Amirkola elderly cohort. A control group, matched for age and sex, was also chosen from the same population. Nutritional data were gathered using a semi-quantitative frequency questionnaire (SQFFQ), and energy and nutrient intakes were assessed using Nutritionist4 software. The phytochemical dietary index was calculated using the McCarty formula .

**Results:** While the phytochemical index and energy from plant sources showed no significant differences between the metabolic syndrome and non-metabolic syndrome groups, diabetic subjects exhibited a higher phytochemical index than non-diabetics ( $P=0.024$ ). Energy intake from plant sources remained consistent between the two groups. No significant correlation was found between blood triglyceride levels and energy intake from plant sources. However, a significant association was observed between energy from plant sources and blood pressure ( $P=0.022$ ), HDL ( $P<0.001$ ), and waist circumference ( $P=0.016$ ). Pearson correlation coefficient revealed a positive and significant relationship between plant-based energy and the phytochemical index ( $r=0.645$ ,  $p<0.001$ ), as well as a negative and significant correlation between age and the phytochemical index ( $r=-0.1$ ,  $p=0.002$ ).

**Conclusion:** This study suggests no direct association between the phytochemical index and metabolic syndrome. However, individuals with diabetes exhibited a higher phytochemical index, possibly indicating a shift in their nutritional patterns.

**Keywords:** Metabolic syndrome, phytochemical index, diabetes, hypertension, waist circumference, plant-based energy





## RELATIONSHIP BETWEEN DIETARY PATTERNS AND COGNITIVE FUNCTION IN OLDER ADULTS: INSIGHTS FROM AMIRKOLA STUDY

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**Background and Aim:** . This study aims to explore the association between dietary patterns and cognitive impairment in adults aged 60 years and older.

**Methods:** This study was Conducted as an analytical case-control study within the ongoing second phase of the Amirkola elderly cohort since 2016, this research includes participants aged 60 and older. Diet assessment employed a semi-quantitative food frequency questionnaire, and cognitive function was evaluated using the mini-mental state examination (MMSE). Randomly selecting 350 samples with cognitive impairment and 350 without, two dietary patterns were identified: one characterized by plant foods rich in phytonutrients and another by protein-rich foods (meats, poultry, and fish).

**Results:** While the control group exhibited significantly higher education levels ( $P < 0.001$ ), BMI and waist circumference showed no significant differences ( $P > 0.05$ ). The consumption of both dietary patterns had positive and significant associations with cognitive function (phytonutrient pattern:  $P < 0.001$ ,  $r = 0.163$ ; protein-rich pattern:  $P < 0.001$ ,  $r = 0.157$ ). Gender-stratified analysis revealed significant associations for both patterns in men (phytonutrient pattern:  $P = 0.001$ ,  $r = 0.180$ ; protein-rich pattern:  $P < 0.001$ ,  $r = 0.213$ ), while in women, significance was observed only for the phytonutrient pattern ( $P = 0.010$ ,  $r = 0.138$ ).

**Conclusion:** This study suggests that both dietary patterns, rich in phytonutrients and protein, are positively associated with better cognitive function in older adults.

**Keywords:** Cognition Disorders, Feeding Behavior, Diet, eating Habits



## DOES PROBIOTIC AND MAGNESIUM CO-SUPPLEMENTATION IMPROVE ANTHROPOMETRIC AND INSULIN RESISTANCE INDICES IN THE ADULTS WITH OBESITY AND DEPRESSED MOOD? A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED, CLINICAL TRIAL

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**Background and Aim:** Obesity drastically gain concern as one of the major public health problems which can lead to depression and consequently cause adverse health effects. The co-existence of obesity and depression is believed to be related to intestinal dysbiosis. Probiotics and magnesium are potentially able to improve dysbiosis and insulin resistance. Thus, we aimed to investigate the effect of probiotic-magnesium co-supplementation on anthropometric and insulin resistance of individuals with obesity and depression.

**Methods:** In a 9-week randomized, double-blind, placebo-controlled clinical trial, 74 obese individuals with depression, were allocated into intervention (probiotics containing: *Lactobacillus rhamnosus* and *Bifidobacterium animalis* subsp. *Lactis* + magnesium chloride, n=39) or placebo (Maltodextrin, n=35) group. Demographic data were collected at baseline. Anthropometrics, body composition, insulin resistance indices, as well as physical activity, and dietary intakes were assessed pre- and post-study.

**Results:** 52 patients aged  $37.51 \pm 8.10$  completed the trial. Participants were statistically similar for baseline characteristics. No dietary and physical activity changes were seen in either group. In comparison to the control group, the intervention group did not show any statistically significant improvements in anthropometric, insulin resistance indices, and body composition ( $P > 0.05$ ). This is while within-group analysis indicated a significant reduction in fasting blood glucose ( $P = 0.031$ ) and waist circumference ( $P = 0.021$ ) after 9 months of probiotic-magnesium co-supplementation.

**Conclusion:** Co-supplementation with probiotics and magnesium did not significantly affect anthropometric status and glycemic indices in obese subjects with depression.

**Keywords:** Probiotics; Magnesium; Insulin-Resistance; Anthropometric



## DOES HYDROALCOHOLIC EXTRACT OF ERYNGIUM CAUCASICUM ALONG WITH AEROBIC EXERCISE HAVE AN EFFECT ON BLOOD GLUCOSE LEVEL AND LIPID PROFILE IN TYPE 2 DIABETIC PATIENTS?

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**Background and Aim:** Eryngium caucasicum is used to control diabetes in traditional medicine. The purpose of this study is to investigate the effect of hydroalcoholic extract of Eryngium caucasicum plant along with aerobic exercise on blood glucose level and lipid profile in type 2 diabetic patients.

**Methods:** In this experimental study, 45 qualified type 2 diabetic patients with an average age of  $46.55 \pm 7.58$  were selected and placed in three equal groups: 1- Aerobic exercise + E. caucasicum 2- Aerobic exercise 3- Control. Aerobic training consisted of six weeks of training, five sessions per week and each session was 45 minutes with moderate intensity. 200 mg of E. caucasicum plant (2 capsules of 100 mg) was taken twice a day in the morning and in the evening after meals for six weeks. Blood glucose and lipid profile were measured by blood tests before and after the intervention. Ancova test and Bonferroni post hoc test were used for data analysis

**Results:** According to the results, aerobic exercise alone and in combination with the use of E. caucasicum capsules reduced blood glucose and triglycerides compared to the control group. Also, glucose decreased more in the exercise group + E. caucasicum compared to the exercise group. HDL and LDL were significantly changed only in the group of aerobic exercise with E. caucasicum ( $P < 0.05$ ). Cholesterol was not affected by intervening variables.

**Conclusion:** Diabetic patients are advised to use aerobic exercise along with E. caucasicum plant to improve their diabetes condition.

**Keywords:** type 2 diabetes, aerobic exercise, Eryngium caucasicum, glucose, lipid profile



## ASSOCIATION OF MATERNAL PRE-PREGNANCY BODY MASS INDEX AND GESTATIONAL WEIGHT GAIN PATTERNS WITH THE RISK OF GESTATIONAL DIABETES MELLITUS: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Gestational diabetes mellitus (GDM) is a common medical disorder that begins during pregnancy. The present work aimed to evaluate the association of maternal pre-pregnancy body mass index and gestational weight gain patterns with the risk of GDM

**Methods:** In this analytic cross-sectional study, of six selected health centers in Urmia, 400 pregnant women subjects who were in their third trimester were recruited in a simple random manner. The nutritional, demographic, clinical data were evaluated. The data were analyzed using chi-square, independent t-test, and logistic regression tests.

**Results:** Seventy-two pregnant women (18%) (95% CI, 14.2–21.7%) were confirmed as having GDM. The mothers who had normal weight were less likely to have GDM than mothers who were obese before pregnancy (OR: 0.329; 95% CI: 0.156–0.696). The low mean of weight gain in pregnant women with low pre-pregnancy BMI was directly related to GDM ( $p=0.01$ ). In contrast, there was a direct association between GDM and the high mean of weight gain in pregnant women who were obese considering pre-pregnancy BMI. respectively ( $p=0.003$ ).

**Conclusion:** Being overweight and underweight before pregnancy increases the risk of GDM; therefore, women should be encouraged to maintain a normal BMI before pregnancy. Excessive and inadequate weight gain also increases the risk of GDM, which is best to train and encourage normal weight gain during pregnancy.

**Keywords:** Gestational diabetes, Pre-pregnancy body mass index, Weight gain



## IS IT POSSIBLE TO PREDICT TYPE 2 DIABETES MELLITUS WITH THE VISCERAL ADIPOSITY INDEX?

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**Background and Aim:** Diabetes is a chronic inflammatory disease that can lead to dysfunction of various organs, including the heart and blood vessels, kidneys, eyes, etc. According to the statistics of the American Diabetes Association (ADA), about 11.6% of the American population will have diabetes in 2021, which shows the high prevalence of this disease. According to various studies, the increase in visceral fat is related to the increase in pro-inflammatory cytokines and the increase in insulin resistance.

**Methods:** All non-diabetic participants were collected from baseline of the Mashhad stroke and heart atherosclerotic disorder (MASHAD). These people were followed for 10 years; after that, they were examined for the occurrence of type 2 diabetes mellitus (T2DM). The association of VAI and incidence of type 2 diabetes mellitus among 10 year follow up was evaluated, using logistic regression.

**Results:** A total of 6,493 non-diabetic participants from phase 1 MASHAD study were enrolled that 1256 of them suffered from T2DM among 10 year follow up. There was a significant association between VAI and T2DM incidence ( $P < 0.001$ ). According to our study, the Best cutoff points was 1.97.

**Conclusion:** Conclusions Based on this study, it seems that the visceral adiposity index may be as a novel anthropometric predictor for the incidence of T2DM.

**Keywords:** Type 2 diabetes, diabetes mellitus, advanced anthropometric indicators, Visceral Adipose Index



## INVESTIGATION OF BLOOD PRESSURE AND BIOCHEMICAL INDICATORS OF HEALTH IN THE EMPLOYEES OF PARSIAN REGION OIL COMPANY

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**Background and Aim:** Nowadays, blood pressure and blood sugar have become one of the most important problems of the world society. On the other hand, diet and lifestyle are one of the most important issues involved in people's health. Therefore, in this article, we intend to examine biochemical indicators and blood pressure in Employees and lifestyle changes to improve the health of employees.

**Methods:** In the current study, blood pressure and biochemical indicators were recorded in 72 people in Isar camp of Parsian region and 86 people in Tabnak camp. ALP, FBS, TG, TC, LDL, HDL) were measured by laboratory devices.

**Results:** About 60% of the employees in the Isar camp and more than 72% in the Tabnak camp had hypertension. Also, 11% of the employees in the Isar camp and 9% in the Tabnak camp had pre-diabetes. Most of the working employees (about 71%) had diabetes Serum total cholesterol was in a good condition. Regarding the LDL index, which is directly related to cardiovascular diseases, about 17% in Isar camp and more than 8% in Tabnak camp had an abnormal condition.

**Conclusion:** The results of the study show that the majority of employees are not in a favorable condition in terms of biochemical indicators of health and blood pressure, and they need to make fundamental changes in their diet and lifestyle.

**Keywords:** Biochemical indicators of health, blood pressure, employee, diet



## EFFECTS OF PROBIOTICS AND MAGNESIUM CO-SUPPLEMENTATION ON STRESS LEVELS AND QUALITY OF LIFE IN OBESE PATIENTS WITH DEPRESSED MOOD: A RANDOMIZED, DOUBLE-BLINDED PLACEBO-CONTROLLED CLINICAL TRIAL

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**Background and Aim:** Obesity is strongly associated with mood disorders. There is evidence that obesity and mood disorders may be related pathologically. Depression and manic episodes are more common among overweight or obese individuals. Human subjects have reported the restorative effects of probiotic supplementation on neuroendocrine functions. Gut microbiota, neuroendocrine status, and obesity are related. Magnesium enriches the gut microbiota. Based on the association between gut microbiota, magnesium levels, obesity, and neuropsychiatric disorders, we examined the possibility of co-supplementation of probiotics and magnesium in humans.

**Methods:** For 74 individuals, demographic data, depression, anxiety, and stress scores were collected, along with body mass index (BMI), waist circumference, and serum cortisol levels. A SPSS analysis was performed.

**Results:** Both the intervention and control groups experienced significant reductions in depression, anxiety, and stress. A significant improvement in mental health, role-emotional function, and vitality was observed in the probiotic and magnesium supplement group.

**Conclusion:** Magnesium supplements and probiotics increased vitality (VT), mental health (MH), and reduced functional impairment from emotional stress (RE). They experienced fewer functional limitations because of physical conditions.

**Keywords:** Probiotics; Magnesium; QOL; Stress; Obesity



## INVESTIGATING KNOWLEDGE, ATTITUDE AND PERFORMANCE TOWARDS THE PRINCIPLES OF HEALTHY EATING AMONG THE EMPLOYEES OF PARSIAN OPERATIONAL AREA

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**Background and Aim:** One of the goals of the researchers was to evaluate the knowledge, attitude and performance of employees regarding the principles of appropriate, healthy and diverse nutrition

**Methods:** 178 participants completed the standard KAP questionnaire in two camps in Parsian region. Finally, the completed questionnaire and the overall KAP score were calculated and reported.

**Results:** Most of the employees participating in the two camps had favorable knowledge in the field of healthy eating (70 percent). In addition, a significant difference was seen between the employees of the two camps, marital status and education level ( $p < 0.001$ ). Also, 70 percent of the employees had a favorable attitude toward but 80% of the employees had an average nutritional performance.

**Conclusion:** The results showed that having good knowledge and attitude did not necessarily lead to good performance in this population.

**Keywords:** Awareness; attitude; performance; oil; Parsian





## FOOD INSECURITY AND THE METABOLIC SYNDROME AMONG WOMEN FROM LOW INCOME COMMUNITIES IN IRAN

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**Background and Aim:** Rapid increase in the prevalence of the metabolic syndrome reflects the strong impact of lifestyle factors. Dietary insecurity, threatens public health and nutritional status, especially that of women. The purpose of this study is investigating the relationship between food insecurity with metabolic syndrome in the women from low income communities referred to Shahriar health homes in the year 1401.

**Methods:** This cross-sectional study was conducted in Shahriar in 1401. A sample of 350 women referred to health center. They were required to fill out the questionnaires (General, Demographic characteristic, and 9 items of food security questionnaire). Anthropometric measurements were also performed by the researcher for all subjects. SPSS was used in order to analyze the data using descriptive statistics and multiple linear regression tests.

**Results:** The prevalence of food insecurity in the women of Shahriar was 45.1% and severe food insecurity, moderate food insecurity and mild food insecurity were reported as 6.6%, 11.4% and 27.1% respectively. 75% of people who were food secure were healthy in terms of metabolic syndrome. Meanwhile, only 30.4% of people with severe insecurity, 52.5% of people with moderate insecurity and 48.4% of people with mild insecurity were healthy in terms of metabolic syndrome. After adjusting for confounders, a significant correlation was noticed between food security and metabolic syndrome.

**Conclusion:** women with better food security status will lead to the improvement of their life and their health.

**Keywords:** Metabolic Syndrom, Food security, Women



## ANTIOXIDANT VITAMINS PLAY ROLE IN RESOLUTION OF INFLAMMATION BY ACTIVATING SOME INFLAMMATORY MECHANISMS

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**Background and Aim:** Hypothesis Inflammation is a normal physiological response of the body in response to pathogens and damaged tissues. If, inflammation conditions that are not controlled by the body can result in severe consequences. The objective of this review is to introduction these mechanisms and role of antioxidant minerals and vitamins to activate mechanisms that control inflammation.

**Methods:** When inflammation occurs within the body, it leads to the accumulation of numerous factors, including the proliferation of patrolling monocytes, the infiltration of Mast cells, the proliferation of tissue macrophages, and the release of chemokines. After finalizing inflammatory factors mission, the body triggers factors for resolution of inflammation. There is an important relationship between dietary intake and reinforce or weaken this resolving mechanism. Many factors, including consumption of recommended daily allowance doses of omega 6 and omega 3 are necessary for retaining these mechanisms in balance. Balance intake of this PUFAs are important factors for equilibrium in these mechanisms. Many previous studies point out antioxidant vitamins as factors that involving with reactive oxygen species (ROS) to reduce their oxidation of cells. Finally, the antioxidants neutralize ROS. But it seems it is not the solely mechanism for decreasing predisposition of tissues to damage and reducing cancerogenous. There is much evidence those showed increasing C-reactive protein in physiologic rang stimulates physiologic apoptosis. The antioxidant vitamins also play a role in activation of some inflammatory factors. Based on recently published meta-analysis supplementation of vitamin A enhances the level of CRP. It seems the antioxidant vitamins encounter by oxidation in body either by neutralize ROSs or they active resolution of inflammation mechanisms.

**Conclusion:** In conclusion anti-oxidant vitamins take action as resolution of inflammation by activate inflammatory factors. Also, ROSs plays important roles for eradication of factors cancerogenous.

**Keywords:** Vitamin A, C-reactive protein, tumor necrosis factor, interleukin 6, selenium, Omega 6, Omega 3



## THE RELATIONSHIP BETWEEN ACID ASCORBIC SUPPLEMENTATION AND ADIPONECTIN, AND LEPTIN LEVEL: A SYSTEMATIC REVIEW IN IN VIVO, IN VITRO AND HUMAN STUDIES

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**Background and Aim:** Leptin and adiponectin, two adipokines, were secreted by adipocytes. Many previous studies reported that these hormones are carcinogenesis effect as an oncogenic potential. Furthermore, the studies found that these hormones play a role in initiation, promotion and progression of cancers and inducing angiogenesis. Moreover, studies indicated that high dose ascorbic acid administration by intravenously presented an anti-cancer effect in early phase of clinical trials. The aim of this systematic review is assessing the relationship between ascorbic acid and leptin and adiponectin concentration.

**Methods:** A systematic search was carried out on databases including PubMed, Scopus, web of sciences and google scholar. Totally, 848 studies were obtained, after removing duplicate (413) studies and screening studies by title and abstracts, 8 studies remained for data extraction. the most included studies performed in in vivo, in vitro and human setting.

**Results:** The studies indicated an inverse relationship between acid ascorbic concentration and leptin level. Moreover, the studies reported that vitamin C restored the leptin to normal range. Also, leptin secretion was decreased in acid ascorbic groups as well the low level of acid ascorbic was related to leptin resistance. Moreover, the studies reported that acid ascorbic lead to increasing the expression of adiponectin genes and lead to promoting the secretion of adiponectin.

**Conclusion:** In conclusion, this study demonstrated that acid ascorbic supplementations present a positive relationship with adiponectin secretion and negative relationship with leptin level. Also, it modulates the plasma level of leptin.

**Keywords:** Adiponectin; Leptin; Ascorbic Acid; In vivo; In vitro; Human; Systematic review



## EFFECTS OF VITAMIN D3 SUPPLEMENTATIONS ON RECOVERY OF HOSPITALIZED BURN PATIENTS: A RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Burn patients might not synthesize vitamin D. These patients might have various problems. We aimed to evaluate the effects of vitamin D3 supplementations (1000 and 3000 IU/day) on recovery of hospitalized burn patients.

**Methods:** A total of 54 patients (35 men and 19 women) participated in a randomized controlled trial. Eighteen patients were assigned to be in group C (control), 18 patients in group D1 (received 1000 IU/day vitamin D3), and 18 patients in group D2 (received a 3000 IU/day vitamin D3). After treatment, wound biopsy and blood samples were obtained. Weight, height, body mass index, 25-hydroxy vitamin D level, wound healing, scar formation, quality of pain, and blood parameters were evaluated.

**Results:** Finding showed significant differences between C, D1 and D2 groups ( $P= 0.02$  and  $P= 0.003$ , respectively) after one week. After two weeks similar results were obtained between the groups ( $P= 0.04$  and  $P= 0.003$ , respectively). Three months after discharge between the groups ( $P= 0.03$ ). There was a significant difference in insulin requirements and a number of insulin units required between the control and the treated groups ( $P= 0.006$  and  $P= 0.01$ , respectively). There was significant difference in hospitalization time between the control and the treated groups ( $P= 0.04$ ).

**Conclusion:** Vitamin D3 supplementary in doses of 1000 and 3000 IU/day improved wound healing, decreased scar thickness and exogenous insulin requirement. The results were better at 3000 IU/day than the 1000 IU/day dosage.

**Keywords:** Burn patients, Vitamin D supplementation, Wound healing, Wound infection, Scar formation



## INTERVENTION FOR CHILDHOOD AND ADOLESCENTS OBESITY :EXPLORING EFFECTING WEIGHT MANAGEMENT STRATEGIES

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**Background and Aim:** Obesity is increasingly prevalent among children and adolescents globally, with nearly 20% affected. Predictions suggest this figure might reach 250 million by 2030, emphasizing the need for effective interventions in this age group.

**Methods:** A search across databases like Google Scholar, Science Direct, Scopus, using keywords 2017 to 2023, resulted in the selection and review of 14 relevant articles.

**Results:** Lifestyle modification emerges as the primary approach to reducing weight in this demographic. Adapting a balanced diet (enhanced fruit and vegetable intake), increasing physical activity, and improving sleep patterns are key measures. Pharmacotherapy supplements lifestyle changes for those unable to achieve weight loss through modifications alone. Combining medication with lifestyle adjustments appears promising. Bariatric surgery, though effective and safe, is underutilized. Additionally, the surgery in smart device usage among youths parallels the obesity rise, making optimal technology utilization and virtual spaces crucial. Studies highlight the efficacy of weight-reduction applications with diverse features. Government policies play a pivotal role in addressing this issue.

**Conclusion:** The adverse impact of obesity on children and adolescents, coupled with the tendency for childhood obesity to persist into adulthood, underscores the urgency of tackling this issue in this age range. Appropriately harnessing effective strategies, particularly technology and virtual spaces, increasingly embraced by youths, holds promise in combatting this epidemic.

**Keywords:** Obesity, Pediatrics, Adolescent, Weight Loss



## COMPARISON OF THE EFFECT OF THE NUTRITIONAL SUPPORT PROGRAM TO IMPROVE THE NUTRITIONAL STATUS OF CHILDREN UNDER 5 YEARS OF NEEDY HOUSEHOLDS IN SEPIDAN CITY DURING THE YEARS 1401-1400

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3. Islamic Azad University Sepidan branch-gmail.com Introduction and goal:

**Background and Aim:** One of the effective factors in improving the nutritional status of children is access to food, especially in needy households. In this study, the impact of the nutritional support program for children under 5 years of age and the comparison of this program during the years 1400 to 1401 have been examined.

**Methods:** In this project, which was implemented with the participation of the Imam Khomeini (RA) Relief Committee, a number of 295 children under 5 years of age in Sepidan city who are suffering from malnutrition or developmental disorders and needy families were identified and introduced to the relief committee. have attended and received training at relevant health centers or hospitals.

**Results:** During the two years of monitoring in 1400, 127 children (12.43%) improved and 22 children (47.7%) dropped out of the program due to over 5 years of age or migration from that region to other countries. Also, during the two phases of monitoring in 1401, 151 children (51.26%) improved and 31 children (10.64%) dropped out of the program.

**Conclusion:** During the two years of monitoring in 1400, 127 children (12.43%) improved and 22 children (47.7%) dropped out of the program due to over 5 years of age or migration from that region to other countries. Also, during the two phases of monitoring in 1401, 151 children (51.26%) improved and 31 children (10.64%) dropped out of the program.

**Keywords:** Nutritional support, household, improved



## INVESTIGATING THE EFFECT OF TRAINING ON THE PREVENTIVE BEHAVIORS OF BLOOD PRESSURE DISEASE BY PROMOTING NUTRITIONAL HEALTH IN THE ELDERLY COVERED BY SEPIDAN CITY CENTER IN 2001-1400

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**Background and Aim:** Hypertension is one of the chronic diseases. According to the report of the Heart Diseases and Stroke Statistics Center of the American Heart Association, only in 2022, about 19 million people died due to cardiovascular diseases, which has increased by 18.7% compared to 2010. It is important to know the relationship between nutritional factors and blood pressure. The nutritional guide should be used to prevent the increase in blood pressure in the elderly and even in its treatment. The aim of the research is to determine the awareness and preventive behaviors of blood pressure disease by promoting nutritional health.

**Methods:** This study was a descriptive and analytical survey in which 80 elderly people covered by the comprehensive service center of Ardkan participated. Sampling was done by a simple random method. The data collection method included a questionnaire (demographics, knowledge, and nutritional behaviors) that was obtained before the validity and reliability study. SPSS software was used for data analysis.

**Results:** Their findings show that 71.26% of the elderly agree that fatty foods are a problem for them, 1.77% of them considered proper nutrition as a way to prevent high blood pressure. 52.69% were against adding salt to food and 85.94% were against using fried foods. 44.53% of the elderly received their information about nutrition and blood pressure from television. Independent t-test did not show a significant relationship between awareness and gender.

**Conclusion:** The results show that information and education is a powerful tool in preventing blood pressure disease and maintaining proper nutrition, and nutrition education is recommended in the field of preventing blood pressure in the elderly.

**Keywords:** Education, behavior, elderly, nutrition, blood pressure



## RISKS OF FOOD ADDICTION AND ITS COMPONENTS OF DEPENDENCE ON FOOD CONSUMPTION IN ADULT PATIENTS WITH HYPERTENSION IN SOUTHWEST OF KHUZESTAN, IRAN

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**Background and Aim:** Consumption of some foods can include addictive potentials. Hypertension and excessive consumption of these foods are associated with addictive eating behaviors. The present study investigated prevalence of food addiction and its components in adults with and without hypertension.

**Methods:** In this study, 96 individuals with and without hypertension ( $n = 48$  in each group) referring to the medical training centers of Abadan University of Medical Sciences, 2021, were participated using simple random sampling method. Weight and height were measured and body mass index (BMI) was calculated. Food addiction and its components were assessed using Yale food addiction questionnaire 2.0. Descriptive statistics and independent sample Ttest were used for data analysis and logistic regression model was used to assess risks of food addiction and its components.

**Results:** The food addiction score and its components were significantly higher in participants with hypertension, compared to the control group ( $p \leq 0.001$ ). Hypertensive participants had a 6.2-time higher risk of food addiction, compared to non-hypertensive ones.

**Conclusion:** This study showed that participants with hypertension had higher scores of food addiction and its components, compared to non-hypertensive participants. Furthermore, risks of food addiction increased in participants with hypertension, compared to non-hypertensive ones.

**Keywords:** Food addiction, Hypertension, Components of dependence, Yale Food Addiction Scale 2.0, Adults





## SERUM COPPER AND MAGNESIUM PATTERN IN PREGNANT WOMEN COVERED BY URMIA URBAN HEALTH CENTERS AND ITS SOME CLINICAL AND NUTRITIONAL DETERMINANTS IN THE THIRD TRIMESTER OF PREGNANCY URMIA, IRAN

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**Background and Aim:** Copper and Magnesium are essential for development of the fetus and maternal health. The aim of this study was to determine the pattern of serum copper in pregnant women in Urmia and its association with some clinical and nutritional factors in the third trimester of pregnancy.

**Methods:** In this analytic cross-sectional study, of six selected health centers in Urmia, 400 pregnant women subjects who were in their third trimester were recruited in a simple random manner. The nutritional, demographic, clinical data as well as fasting blood samples were taken from each of the subjects. The data were analyzed using chi-square, independent t-test and logistic regression tests.

**Results:** The serum analysis showed that Magnesium and copper deficiency among studied population were not prevalent but high serum levels of magnesium and copper were seen in 24% and 13% of them respectively. Based on binary logistic regression model outputs, the development of excessive serum magnesium levels was directly correlated with dietary magnesium intake, magnesium supplementation and dietary fiber intake (OR: 1.109; 95% CI: 1.008-1.219) and inversely correlated with total dietary intake of calcium. pregnant women with high pre-pregnancy BMI had higher serum copper than mothers with lower pre-pregnancy BMI. pregnant women with iron deficiency anemia had higher serum copper than non-anemic pregnant mothers.

**Conclusion:** Pregnant women in Urmia probably have high concentrations of serum magnesium and it is likely related to consumption of the Mg supplementation. Supplementation programs need to be scaled up for pregnant women that take inadequate dietary Mg.

**Keywords:** Copper, Magnesium, Pregnancy



## THE ENRICHMENT OF YOGURT WITH HONEY AND RICE BRAN: A BRIEF REVIEW

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**Background and Aim:** In recent years, food industry researchers have sought to produce super-beneficial foods and create products enriched with compounds to achieve higher nutritional value and health.

**Methods:** In this paper, we have done a brief review about the enrichment of yogurt with honey and rice bran.

**Results:** Honey is a supersaturated solution of glucose and fructose that contains minerals, vitamins and probiotic bacteria. The use of this substance in the medicine, wound healing and healing of inflammation is known. Researches show that adding honey to yogurt, in addition to improving physical properties and changing pH, increases antioxidant activity and phenolic content. Considering the presence of biologically active substances such as phenolic acids, flavonoids and vitamins, it seems that the combination of yogurt and honey is useful in fighting diabetes. Rice bran is a byproduct obtained from rice milling and contains macronutrients such as protein, fat and dietary fiber. The dietary fiber in it plays a role in balancing intestinal microbes. This substance has the antioxidant, anti-diabetic, and anti-inflammatory activity. Studies show that the addition of rice bran to yogurt reduces its wateriness, viscosity, and sensory scores, and increases its antioxidant activity, water holding capacity, and pH. The addition of black rice bran to yogurt increase protein and carbohydrate and decrease fat and water content and can increase the total number of lactic acid bacteria

**Conclusion:** It seems that enriching yogurt with honey and rice bran, in addition to increasing the nutritional value of this food, can be beneficial for the prevention and treatment of some diseases.

**Keywords:** Yogurt; Enrichment; Honey; Rice bran



## INVESTIGATING THE EFFECT OF EIGHT WEEKS OF GENISTEIN SUPPLEMENTATION ON THE ACTIVITY OF THE LIVER LIPOGENESIS PATHWAY IN OBESE RATS

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mandana Gholami

**Background and Aim:** Obesity is an inflammatory disease associated with oxidative stress. One of the target tissues in obesity is the liver. The use of anti-inflammatory and antioxidant supplements can minimize the damage caused by obesity. The purpose of this study is to investigate the effect of 8 weeks of Genistein supplementation on the activity of the hepatic lipogenesis pathway in obese rats

**Methods:** 15 rats with an average weight of  $220 \pm 20$  were randomly divided into 3 control groups, obesity model and obesity model + Genistein supplement. The first group was fed with standard rodent food and the model groups were fed with high-fat diet and treated for 8 weeks. SREBP1 and Sirt1 gene expression was measured by RT PCR and glutathione peroxidase (GPX) technique using a special laboratory kit for this enzyme and measured in tissue by ELISA method

**Results:** Induction of obesity model caused a significant increase in body weight, tissue macrophage infiltration and liver SREBP1 expression and a decrease in liver GPX and SIRT1 gene compared to the control group ( $p < 0.05$ ). Consumption of Genistein in obese rats reduced body weight, tissue macrophage infiltration, and liver SREBP1 expression compared to the obese model group ( $p < 0.05$ ).

**Conclusion:** Eight weeks of taking Genistein supplements can reduce fat mass by affecting the factors affecting lipolysis and lipogenesis in the liver. Therefore, it is suggested to use Genistein supplement in order to reduce fat mass and improve liver metabolism

**Keywords:** Genistein, Hepatic lipogenesis, Inflammation, Oxidative stress



## FACTORS AFFECTING DETERRENCE AND THE TENDENCY TO USE PERMITTED AND ILLEGAL SUPPLEMENTS AND DRUGS AMONG MALE BODYBUILDERS IN QAZVIN

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**Background and Aim:** Over the course of recent decades, there has been a considerable expenditure of millions of dollars on supplements, vitamins, and energizing substances due to an increased enthusiasm for physical fitness and body image among individuals. Hence, given the significance of nutritional knowledge pertaining to the positive and negative impacts of sports supplements, it is imperative to investigate the factors affecting deterrence and the tendency to use permitted and illegal supplements and drugs among bodybuilders.

**Methods:** This cross-sectional study conducted in Qazvin. 385 male bodybuilder athletes, regardless of their professional or non-professional status voluntarily filling out our questionnaire. We evaluate the validity of our questionnaire, by the Fornell Larcker table validity of the approach. To ascertain the reliability of the questionnaire, with a specific focus on the internal consistency of the questions, two statistical methods were employed: Cronbach's alpha coefficient and the combined reliability coefficient.

**Results:** The outcomes revealed that factors such as awareness, dissatisfaction with body weight, attitude, and competition have a positive impact on the desire to consume these substances ( $p < 0.05$ ). However, there was no positive association found between price of product, the maintenance of health, dissatisfaction with body type and deterrence to use permitted and illegal supplements ( $p > 0.05$ ).

**Conclusion:** The findings exhibited that consciousness; discontentment with body mass, attitude, and competition possess a positive impact on the inclination to consume both authorized and unauthorized supplements and medications. Furthermore, the study yielded no correlation between the price of the product, health preservation, and the willingness to consume authorized and unauthorized supplements and medications.

**Keywords:** Supplements, Drugs, Bodybuilders, Illegal use, Affecting factors



## THE EFFECT OF CALORIE RESTRICTION AND INTERMITTENT FASTING ON ATHLETES AEROBIC PERFORMANCE (VO<sub>2</sub>MAX)

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**Background and Aim:** Dietary strategies known as calorie restriction (CR) often involve cutting back on calories (20–40% of an ad libitum diet) without compromising the consumption of vital nutrients. The term Intermittent fasting (IF) has multiple definitions that involve different lengths of fasting (typically 12 hours or longer). In addition, it suggests a constrained feeding window whether or not CR is present. Time-restricted feeding (TRF) and numerous days or weeks of fasting (either alternate-day or full-day fasting) are two examples. VO<sub>2</sub> max, which is also known maximal aerobic capacity, refers to the greatest amount of oxygen that a person's body can consume in their motor muscles and transport through their circulatory system.

**Methods:** The participants followed an every-other-day fasting CR program for six weeks, cutting their caloric intake by 33% compared to their regular diets. Participants in the 5:2 group were given about 30% of their required calorie intake on fasting days, which are two non-consecutive days per week, and 70% of their total energy intake on non-fasting days. All participants performed a Graded exercise testing (GXT) to volitional exhaustion on a treadmill to determine VO<sub>2</sub>max.

**Results:** In overweight men and women, a 20% calorie restriction lowers absolute VO<sub>2</sub>max. In the CR group, absolute aerobic capacity dropped by about 6% ( $p=0.04$ ). The results showed that whereas Ramadan intermittent fasting (Ramadan IF; SMD = -2.20,  $p < 0.001$ ) greatly reduces maximum oxygen absorption, TRF protocols significantly increase it (SMD = 1.32,  $p = 0.001$ ).

**Conclusion:** In conclusion, CR may reduce aerobic capacity (VO<sub>2</sub>max) but IF can increase the aerobic capacity.

**Keywords:** Low-Calorie Diets; Time Restricted Fasting; Fasting; Intermittent Fasting



## NANOMEDICINE IN NUTRITION: A SYSTEMATIC REVIEW

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**Background and Aim:** The objective of this systematic review is to examine the impact of nanomedicine in the field of nutrition. The study focuses on investigating nanomedicine technologies in nutrition, including nanostructured foods, dietary supplements, and nanotechnology-based packaging. The ultimate goal of this study is to evaluate the effects of nanomedicine technologies on improving nutrition and human health.

**Methods:** A systematic review was performed on "Nanomedicine in Nutrition." The literature search included articles published up to 2022. 9 articles were selected based on predefined inclusion criteria, including human and animal studies. Two independent reviewers conducted study selection, data extraction, and quality assessment. Due to heterogeneity, a meta-analysis was not conducted. The included articles spanned from 2010 to 2022. The findings were synthesized narratively to highlight key outcomes and implications.

**Results:** Nanomedicine in nutrition improves nutrient absorption and delivery reduces side effects, and enhances product safety. It shows promise in addressing nutritional challenges. However, more research is needed to understand the long-term effects and risks. Nanomedicine has transformative potential in nutrition.

**Conclusion:** Nanomedicine in nutrition has promising potential to enhance nutrient delivery, reduce side effects, and improve product safety. Further research is needed to understand long-term effects and risks. Nanomedicine offers exciting possibilities for improving human health in the field of nutrition.

**Keywords:** Nanomedicine. Nutrition. Systematic Review



## VANADIUM AND DIABETIC DYSLIPIDEMIA: A SYSTEMATIC REVIEW OF ANIMAL STUDIES

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**Background and Aim:** Diabetic dyslipidemia is caused by hyperglycemia and excessive mobilization of storage lipids, leading to increasing concentrations of triglycerides and total cholesterol. Due to the insulin-mimetic or insulin-enhancer features of vanadium, it has been recognized as a regulator of cell metabolism with hypoglycemic and hypolipidemic properties. The purpose of the current animal systematic review was to evaluate the effect of vanadium administration on diabetic dyslipidemia in diabetic animals.

**Methods:** This is, to our knowledge, the first systematic review with the aim of investigating the relationship between vanadium and diabetic dyslipidemia among diabetes induced animals. Searches were performed in PubMed, Scopus, and web of science databases for animal studies examining the effect of vanadium on diabetic dyslipidemia in diabetic animals. Of 124 full-text articles assessed, 48 animal studies were included in the present study with minor risk of bias. The majority of the studies confirmed the beneficial effects of different vanadium compounds in at least one of the parameters of lipid profile, especially regarding triglyceride and total cholesterol.

**Conclusion:** Current findings lend support to assess the long-term effects of different forms and doses of vanadium on lipid profile through well-designed clinical trials.

**Keywords:** Systematic Review; Animal; Diabetes Mellitus; Dyslipidemia; Lipids



## VANADIUM AND BIOMARKERS OF INFLAMMATION AND OXIDATIVE STRESS IN DIABETES: A SYSTEMATIC REVIEW OF ANIMAL STUDIES

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**Background and Aim:** Oxidative stress has a significant role in the commencement and development of hyperglycemia. Vanadium, as a transitional metal with redox properties, enters the redox process, produces free radicals, and distracts the pro-antioxidant balance. The present animal systematic review aimed to assess the effect of vanadium supplementation on inflammation and oxidative stress biomarkers in diabetes-induced animals.

**Methods:** A systematic search was conducted using the PubMed, Scopus, and web of science databases from 1990 to 2021, according to the inclusion and exclusion criteria. The search strategy was based on the guidelines for systematic review of animal experiments and Preferred Reporting Items for Systematic Reviews (PRISMA). Criteria for eligibility were animal-based studies, evaluating the therapeutic effects of vanadium on inflammatory and oxidative stress biomarkers in diabetes. The Systematic Review Centre for Laboratory Animal Experimentation (SYRCLE) tool was used for assessing the methodological quality of included studies. In the present study, 341 articles were evaluated out of which 42 studies were eligible for inclusion. The majority of the studies confirmed the advantageous properties of vanadium on inflammatory and oxidative stress biomarkers. A minor risk of bias was reported, based on the SYRCLE's tool.

**Conclusion:** According to the findings, well-designed clinical trials are warranted to assess the long-lasting effects of various vanadium compounds on inflammatory and oxidative stress biomarkers.

**Keywords:** Systematic Review; Animal; Diabetes Mellitus; Inflammation; Oxidative stress





## ANTI-OBESITY PROPERTIES OF PROBIOTICS; A CONSIDERABLE MEDICAL NUTRITION INTERVENTION: FINDINGS FROM AN UMBRELLA META-ANALYSIS

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**Background and Aim:** Although several studies have indicated that consumption of probiotics is effective in the treatment of obesity, the results in this regard have yielded controversial findings. The current umbrella meta-analysis was performed to evaluate the effects of probiotics supplementation on obesity indices in adults.

**Methods:** Scopus, PubMed, Web of Science, Embase and Google Scholar were searched for relevant studies published till November 2021. Meta-analysis was conducted using the random-effects model. Sensitivity and subgroup analyses were performed. In total, 29 meta-analyses with 14,366 participants, including 112, 78, and 38 unique trials for body mass index (BMI), body weight (BW), and waist circumference (WC), were included in the study, respectively. The findings demonstrated that the probiotics supplementation was significantly effective on decreasing of BMI (ES = -0.21; 95% CI: -0.30, -0.13,  $p < 0.001$ ;  $I^2 = 83.0\%$ ,  $p < 0.001$ ), BW (ES = -0.38, 95% CI: -0.60, -0.16;  $p < 0.001$ ;  $I^2 = 81.8\%$ ,  $p < 0.001$ ), and WC (ES = -0.60; 95% CI: -0.89, -0.31;  $p < 0.001$ ;  $I^2 = 89.1\%$ ,  $p < 0.001$ ). Greater effects on BW were observed when intervention duration was  $>8$  weeks and on obese individuals. BMI was also greatly modified in participants with metabolic syndrome and when intervention duration lasted for  $\geq 12$  weeks. The methodological quality (AMSTAR2) was moderate in 83%, low in 10%, and critically low in 7% of included studies.

**Conclusion:** The current umbrella meta-analysis indicated that supplementation of probiotics in adults led to a meaningful reduction in BW, BMI, and WC. Therefore, our findings strongly recommend supplementation with probiotics as a potent intervention in the management of obesity.

**Keywords:** Probiotics; obesity; meta-analysis; umbrella



## Psyllium supplementation and its impact on lipid profiles: systematic review and dose-response meta-analysis of randomized controlled trials

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**Background and Aim:** Psyllium supplementation may improve lipid profiles levels.

**Methods:** This study assessed the impact of psyllium consumption on lipid profiles (HDL\_C, TG, LDL-C, and cholesterol). The eligible publications from 15 March 2022 to 2023 were identified by using Scopus, ISI Web of Science (WOS), and PubMed. The effect of psyllium on lipid profiles in adults was evaluated through randomized controlled trials (RCTs). Weighted mean differences (WMD) with 95% confidence intervals (CI) was calculated using a random effects model. 43 RCT articles and 2487 participants were included in this study.

**Results:** Comparison psyllium with placebo showed a significant decrease in Low Density Lipoprotein cholesterol (LDL\_C) and cholesterol (CHOL), nonsignificant decrease in Triglyceride (TG), and increase in High Density Lipoprotein (HDL\_C) as; cholesterol: (WMD: -9.05; 95% CI: -13.71, -4.40;  $p < 0.05$ ), HDL\_C: (WMD: 0.57; 95% CI: -0.88, 2.04;  $p > .05$ ), TG: (WMD: -5.29; 95% CI: -12.14, 1.54;  $p > 0.05$ ), and LDL-C: (WMD: -8.55; 95% CI: -12.92, -4.19;  $p < 0.0001$ ). Duration and dosage of psyllium had a non-significant linear influence on lipid profiles, but were nonsignificant. Results showed a significant decrease in LDL\_C and cholesterol, nonsignificant decrease in TG and increase in HDL\_C following psyllium consumption.

**Key words:** Psyllium, Lipid Profiles



## ASSOCIATION OF BISPHENOL A WITH OUTCOMES OF ASSISTED REPRODUCTIVE TECHNOLOGIES: A SYSTEMATIC REVIEW

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**Background and Aim:** This systematic review examines how bisphenol A affects assisted reproductive technologies (ART) and addresses the global issue of infertility due to toxins.

**Methods:** To gather relevant information, articles from the years 2000 to 2023 were retrieved from PubMed, Google Scholar, Web of Science, and Scopus databases. A total of seven studies were assessed according to the Cochrane protocol that explored the relationship between bisphenol A and the success of ART.

**Results:** Through careful examination of these articles, it is evident that bisphenol A negatively influences spermatogenesis and steroidogenesis, leading to increased prostate size, shortened anogenital distance, disrupted blood-testis barrier, and alterations in mature sperm parameters including count, motility, concentration, and density. Furthermore, bisphenol A induces oxidative stress in the testis and epididymis by inhibiting antioxidant enzymes and promoting lipid peroxidation. Additionally, a significant association was found between urinary bisphenol A concentration and a reduction in the number of eggs (both total and mature), normal fertile eggs, levels of E2 hormone, and blastocyst formation. Moreover, analysis of the relationship between bisphenol A and sex hormones revealed a negative correlation only with anti-Müllerian hormone and antral follicle count, while no significant associations were observed with other parameters related to ovarian reserve.

**Conclusion:** This study reveals that bisphenol A has harmful effects on ART, affecting sperm and hormone production and causing oxidative stress in the reproductive organs. The findings suggest that there should be more research and interventions to reduce exposure to bisphenol A in order to improve reproductive health outcomes.

**Keywords:** bisphenol A, infertility, assisted reproductive technology



## EFFECT OF SOY CONSUMPTION AND OUTCOMES OF ASSISTED REPRODUCTIVE TECHNOLOGIES: A SYSTEMATIC REVIEW

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**Background and Aim:** Infertility negatively impacts psychological, mental, spiritual, and medical health. Soy's beneficial compounds, isoflavones and phytoestrogens, may affect infertility. This review explores soy's link to assisted reproductive technology success.

**Methods:** This review was conducted by searching databases including PubMed, ISI, Scopus, and Google Scholar, using keywords specified in the Cochrane protocol that examined the relationship between soy and the outcomes of ART.

**Results:** Findings from the reviewed studies indicate that patients who received phytoestrogens as luteal phase support had statistically higher rates of implantation, clinical pregnancy, and ongoing pregnancy/delivery, compared to those who received placebo. Additionally, consumption of soy isoflavones was found to be positively correlated with the live birth rate in ART, as compared to women who did not consume soy isoflavones. Moreover, it was observed that consuming soy food modified the association between urinary bisphenol A (BPA) concentration and live birth rate.

**Conclusion:** This research suggests that dietary soy intake is positively associated with the likelihood of having a live birth during infertility treatment with ART and can help protect against the adverse reproductive effects of BPA. High doses of phytoestrogens may counteract the negative effects of clomiphene citrate on endometrial thickness and potentially contribute to higher pregnancy rates. While the results of this study encourage the use of soy for luteal phase support in patients undergoing IVF-ET programs, further research is warranted to explore the underlying mechanisms and potential risks associated with soy consumption in the context of ART.

**Keywords:** Soy, Phytoestrogens, Infertility, Isoflavones, Assisted Reproductive Technologies



## WEIGHT CHANGES AND RELATED FACTORS DURING TUBERCULOSIS TREATMENT IN GOLESTAN PROVINCE IN 2018

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**Background and Aim:** To investigate weight changes during treatment and related factors in patients with tuberculosis in Golestan province in 2018

**Methods:** A historical cohort study was conducted, analyzing the data of 348 tuberculosis patients from the TB Registry system. Changes in patients' weight were assessed in relation to variables including age, gender, type of tuberculosis, residence (urban or rural), and treatment outcomes using SPSS version 22 software. Statistical analyses included calculation of mean and standard deviation, chi-square tests, Fisher's exact test, paired t-test, independent t-test, ANOVA, and non-parametric equivalents. A significance level of less than 0.05 was considered.

**Results:** Patients exhibited an average weight gain of  $1.98 \pm 2.83$  kg after treatment ( $P < 0.001$ ). Among those with pulmonary tuberculosis, individuals with positive sputum smear tests showed significant weight gain ( $P < 0.001$ ). Additionally, patients with negative sputum smears experienced greater weight gain compared to other conditions. While weight change was slightly higher in men than in women, both genders demonstrated significant weight gain ( $P < 0.001$ ). Rural patients displayed a higher weight gain than urban patients, with statistically significant average weight changes for both groups ( $P < 0.001$ ). The lowest and highest weight changes were observed in the age groups of over 65 years and under 15 years, respectively.

**Conclusion:** Factors such as type of tuberculosis, sputum smear positivity, treatment outcomes, gender, residence, and age were found to influence weight changes in tuberculosis patients. Patients' age appeared to correlate with lower weight gain by the end of treatment. The total weight gain observed in this study was less in comparison to previous researches.

**Keywords:** Weight; Pulmonary Tuberculosis; Extrapulmonary Tuberculosis; treatment



## THE EFFECT OF FOOD SUPPORT ON THE RECOVERY OF TUBERCULOSIS PATIENTS IN GOLESTAN PROVINCE IN 2017

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**Background and Aim:** To assess the impact of food support on the recovery of pulmonary tuberculosis patients in Golestan province, as compared to those without support.

**Methods:** A case-control study was conducted in 2017, with the case group received food support, and the control group comprising patients who did not receive any support. Mean and standard deviation, independent T test and repeated analysis of variance were used. The treatment outcomes and influencing variables were compared, with a significance level set at less than 0.05.

**Results:** 148 patients were in the case group, age  $45.85 \pm 20.31$  yrs, consisting of 60 women and 88 men. The initial average BMI of the case group was  $19.58 \pm 4.35$  kg/m<sup>2</sup>. Significant weight gain was observed among patients ( $P < 0.013$ ). Children above 5 years old experienced faster weight gain. The control group comprised 399 patients. The case group showed a higher percentage of recovery compared to the control group (94.6% vs. 88.7%;  $P$ -value=0.049). Additionally, the case group had lower rates of treatment failure (3 vs. 16) and fewer deaths (3 vs. 25) compared to the control group. The distribution of food support baskets increased the likelihood of patient recovery by 5.9% ( $P$ -value=0.049). Moreover, the relative risk of not improving in the control group was 2.9 times higher compared to the case group (95% CI 1.04–4.49).

**Conclusion:** The findings of this study highlight the synergistic effect of nutritional support in tuberculosis treatment, emphasizing the importance of providing such support to reduce treatment failure and enhance recovery rates.

**Keywords:** Tuberculosis; malnutrition; weight gain; BMI; food support



## STUDY THE EFFECT OF ETHANOLIC EXTRACT OF ARTICHOKE LEAF ON NEUROPATHIC PAIN INDUCED BY CHRONIC CONSTRICTION INJURY OF THE SCIATIC NERVE AND OXIDATIVE STRESS PARAMETERS IN MALE RATS

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**Background and Aim:** Neuropathic pain, arising from nerve damage, encompasses symptoms. Current treatments present challenges. Antioxidants in plants, especially those with anti-inflammatory properties, offer therapeutic potential. Globe artichoke, known for its antioxidant-rich composition, particularly in leaves, has been traditionally used for liver-biliary diseases. This study explores the potential of artichoke extract in mitigating neuropathic pain induced by chronic sciatic nerve injury.

**Methods:** Male rats were grouped into control, neuropathic pain (CCI), and three artichoke-treated groups for 21 days. Chronic constriction injury (CCI) was induced on the sciatic nerve. Artichoke extract was obtained through an aqueous alcoholic method. serum oxidative stress biomarkers were assessed.

**Results:** Behavioral tests revealed significant alterations in thermal and mechanical responses in CCI-induced rats compared to controls. Artichoke extract demonstrated a potential to ameliorate these responses. Serum oxidative stress biomarkers indicated increased lipid peroxidation in CCI, countered by artichoke extract, which also restored antioxidant enzyme activities. Total antioxidant capacity showed no significant change.

**Conclusion:** This study highlights artichoke extract's promising role in mitigating oxidative stress associated with neuropathic pain. The observed improvements in lipid peroxidation and antioxidant enzyme activities, along with behavioral enhancements, advocate for further exploration of artichoke extract as a prospective adjunctive therapy in the management of neuropathic pain.

**Keywords:** Neuropathic pain; Artichoke; Hyperalgesia; Allodynia; Oxidative stress



## ASSOCIATION OF COFFEE CONSUMPTION WITH RISK OF BONE FRACTURE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CASE-CONTROL AND PROSPECTIVE STUDIES

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**Background and Aim:** Osteoporosis, a metabolic skeletal disease, poses a significant public health challenge, particularly among the elderly. Its asymptomatic nature often leads to diagnoses only after fractures occur. Lifestyle factors have been linked to fracture risk. Therefore, this meta-analysis aims to comprehensively investigate the relationship between coffee and caffeine consumption with fractures using observational studies.

**Methods:** A systematic search of online databases, including Scopus, PubMed, and Google Scholar, was conducted to identify relevant studies published until September 2023. After screening 685 publications, 18 studies met the inclusion criteria. Data extraction included key study details, exposure assessment methods, outcomes, and relevant confounders. Statistical analyses were performed using a random-effects model, and heterogeneity was assessed.

**Results:** Among the 685 publications initially identified, 17 studies met the inclusion criteria for this meta-analysis. These studies included both prospective cohort and nested case-control designs and were conducted in various countries with diverse participant demographics. However, the analysis revealed no statistically significant association between coffee consumption and the risk of hip fracture (RR: 1.08; 95% CI: 0.95, 1.24), significant relationship was observed in association between caffeine consumption and the hip fracture risk (RR: 1.62; 95% CI: 1.20, 2.20).

**Conclusion:** dietary intake of caffeine was associated with risk of hip fracture. but Dietary coffee intake was not associated with incidence of hip fracture or all fracture. Further studies are warranted to examine the association of caffeine with hip fracture.

**Keywords:** coffee, caffeine, hip fracture, osteoporotic fractures





## THE EFFECT OF QUERCETIN SUPPLEMENTATION ON CLINICAL OUTCOMES IN COVID-19 PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Coronavirus disease (COVID-19) affects both the respiratory system and the body as a whole. The aim of this systematic review and meta-analysis is to give a comprehensive overview of the impact of quercetin supplementation on inflammatory factors, hospital admission, and mortality of patients with COVID-19.

**Methods:** The search has been conducted on PubMed, Scopus, and the Cochrane Library using relevant keywords until March 15, 2023. We included randomized controlled trials (RCTs) comparing COVID-19 patients who received quercetin supplementation versus controls. We included five studies summarizing the evidence in 544 patients. Meta-analysis showed that quercetin administration significantly reduced LDH activity, decreased the risk of hospital admission by 30%, ICU admission by 27%, and mortality by 18%. Quercetin was found to significantly reduce LDH levels and decreases the risk of hospital and ICU admission and mortality in patients with COVID-19 infection.

**Conclusion:** The findings from this systematic review and meta-analysis demonstrate its potential as a therapeutic agent against COVID-19. We found that quercetin significantly reduce LDH levels and decreases the risk of hospitalization, ICU admission, and mortality in COVID-19 patients. These beneficial effects are potentially attributable to its antioxidant, anti-inflammatory, and immunomodulatory activities. However, the effects of quercetin on other important indicators in COVID-19 patients, such as CRP, ferritin, and D-dimer in particular, need to be evaluated in large, long-duration RCTs.

**Keywords:** Quercetin; COVID-19; LDH; CRP; D-dimmer; Ferritin; Mortality



## THE EFFECT OF SELENIUM, ZINC, AND THEIR COMBINED SUPPLEMENTATION ON CARDIOMETABOLIC BIOMARKERS- COMPARING THEIR EFFECTS IN THE ENERGY RESTRICTION AND HIGH-FAT DIET (HFD) METHODS IN OBESE RATS

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**Background and Aim:** This study evaluated the effect of zinc (Zn), selenium (Se), and their combined supplementation on cardiometabolic risk factors in male Wistar rats in two nutritional models, including caloric restriction (CR) and high-fat diet (HFD).

**Methods:** The 48 male Wistar rats were divided into three diet groups (HFD and CR and normal diet (ND)). The HFD group was subdivided into four groups (N=8 rats in each group) that received (HFD+Se), (HFD+Zn), (HFD+Zn+Se), and HFD alone as the control group, respectively. After 8 weeks of intervention, biochemical tests were performed on serum levels, including measurement of lipid profile (triglyceride, Cholesterol, LDL and HDL) and glycemic indices (fasting blood sugar, insulin and insulin sensitivity markers).

**Results:** The results showed that supplementation significantly improved the lipid profile ( $P < 0.001$ ). A comparison of glucose homeostasis indices in the study groups also showed a significant difference. The serum level of glucose was higher in the HFD group than in the intervention groups ( $P < 0.001$ ). Also, the rate of improvement of lipid profile and glycemic indexes in the group receiving the combination of two supplements showed a better trend than those receiving zinc and selenium alone, although the values were statistically significant only for glucose homeostasis indices ( $P < 0.001$ ).

**Conclusion:** Although, obesity is a multifactorial condition, by controlling other risk factors, zinc and selenium and their combined supplementation can lead to promising solutions for the treatment of obesity-induced glucose and lipid homeostasis disorders.

**Keywords:** glucose homeostasis, lipid profile, obesity; Antioxidants



## IMPACT OF LOW-CALORIE, HIGH-PROTEIN DIET ON BODY COMPOSITION, DURATION, AND SLEEP QUALITY IN OBESE ADULT: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** In recent decades, there has been growing research interest in exploring the effects of high-protein diets on sleep regulation. However, limited studies have focused on investigating the impact of these diets specifically in obese adults. Therefore, this study aimed to fill this research gap by investigating the effects of low-calorie, high-protein diets on sleep quality in obese adults.

**Methods:** Materials and Methods: This randomized clinical trial enrolled 60 obese adults (BMI > 29.9 kg/m<sup>2</sup>) who were diagnosed with low-quality sleep. All participants were assigned to either the control group or the intervention group. Both groups were provided with a diet that imposed a 750-calorie energy deficit. However, the intervention group received a modified diet with an additional 30% protein compared to the normal diet provided to the control group. -Results: The findings of this study revealed significant differences between the control group and intervention group in terms of sleep apnea at the 30-, 60-, and 90-day follow-up assessments ( $p < 0.01$ ). Moreover, there were significant differences observed between the two groups in sleep quality, apnea-hypopnea index (AHI), sleep latency (SL), and polysomnography ( $p < 0.05$ ). These results indicated an improvement in sleep quality and a reduction in obstructive sleep apnea in the intervention group ( $p < 0.05$ ).

**Conclusion:** The findings of this study suggest that implementing low-calorie, high-protein diets can be an effective approach to improve apnea, enhance sleep quality, and positively influence body composition indices in obese adults

**Keywords:** apnea, high-protein diet, low-calorie diet, obesity, sleep quality



## THE EFFECT OF A LOW-CALORIE, HIGH-PROTEIN DIET ON PSYCHOMETRIC VARIABLES IN OBESE INDIVIDUALS: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** The global prevalence of obesity has become a significant public health concern, especially in low- and middle-income countries. The present study was conducted to examine the effects of a low-calorie, high-protein diet on psychometric variables in obese individuals.

**Methods:** -Materials and Methods: In this randomized clinical trial study, eligible participants were randomly allocated to either the intervention group, which received a low-calorie diet with an increased percentage of protein, or the control group, which followed a standard protein percentage diet. The psychometric characteristics of the participants were assessed using the Depression Anxiety Stress Scale-2 (DASS-2) questionnaire. -Results: There were no statistically significant differences in anthropometric variables, body composition, and physical activity between the two groups ( $p$ -value  $> .05$ ). Likewise, no significant differences were found in psychological variables, including depression, anxiety, and stress, ( $p$ -value  $> .05$ ). However, the intervention group exhibited significantly lower depression and anxiety scores at the 15-day mark of the intervention ( $p$ -value  $< .05$ ). Furthermore, at 30 and 60 days, significant differences were observed between the two groups in terms of depression, stress, and anxiety ( $p$ -value  $< .05$ ), indicating a relative improvement in psychometric variables in the intervention group ( $p$ -value  $< .05$ ).

**Conclusion:** The findings of this study indicate that implementing low-calorie diets with a high protein percentage can lead to significant improvements in psychometric variables among obese individuals. The trial was registered with the Iranian Registry of Clinical Trials, with the identifier IRCT20221101056371N1.

**Keywords:** High-protein diet; Low-calorie diet; Obesity; Psychometric variables; anxiety; depression; overweight; stress.



## IS THERE ANY ASSOCIATION BETWEEN DIETARY TOTAL ANTIOXIDANT CAPACITY AND THE ACTIVITY OF RHEUMATOID ARTHRITIS DISEASE

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**Background and Aim:** A growing body of evidence suggesting the involvement of oxidative stress (OS) in the pathophysiology of various chronic diseases including rheumatoid arthritis (RA). This article aimed to investigate the association between dietary total antioxidant capacity (DTAC), and the activity of RA disease.

**Methods:** In this case-control study, one hundred newly diagnosed patients with RA and one hundred age and gender-matched healthy individuals were participated. DTAC was calculated by the ORAC method, according to the participants' food frequency questionnaire-derived dietary data.

**Results:** Patients diagnosed with RA exhibited notably lower levels of DTAC in comparison to individuals without RA. Disease activity significantly and negatively was correlated with DTAC ( $r=-0.220$ ,  $p=0.02$ ).

**Conclusion:** Higher DTAC may have a protective role against RA disease and may decrease disease activity.

**Keywords:** dietary total antioxidant capacity, rheumatoid arthritis



## THE ASSOCIATION BETWEEN EMPIRICAL DIETARY INFLAMMATORY PATTERN AND RISK OF CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Dietary factors have either promoted or reduced inflammation, which is associated with influencing the risk of cancer. The systematic review and meta-analysis aimed to assess the association between recently established empirical dietary inflammatory pattern (EDIP) and risk of total and site-specific cancer.

**Methods:** A systematic electronic search of PubMed/Medline, Scopus, the Web of Sciences, and reference lists up to November 11, 2023, was performed. Data were pooled by the generic inverse variance method using random effect model. To assess the heterogeneity of included studies, the I<sup>2</sup> index was used.

**Results:** A total of 17 original publications from the initial 285 studies, including 1,939,903 participants were selected to include in this meta-analysis. The most common cancers investigated were colorectal, ovarian, breast, liver, prostate and endometrial. Pooled results showed a significant association between higher adherence to EDIP and risk of total cancer (ES:1.15;95%CI:1.08-1.22;I<sup>2</sup>=77.3), Colorectal cancer (ES:1.14;95%CI:1.08-1.23;I<sup>2</sup>=64.8), ovarian cancer (ES:1.14;95%CI:1.00-1.31;I<sup>2</sup>=82), liver cancer (ES:1.19;95%CI:1.03-1.37;I<sup>2</sup>=79.9), breast cancer (ES:1.05;95%CI:1.00-1.11;I<sup>2</sup>=78.2), and endometrial cancer (ES:1.17;95%CI:1.03-1.34;I<sup>2</sup>=0). There were consistent and significant positive association between higher adherence to EDIP and risk of total cancer across study type, region, age subgroups. Furthermore, the positive association persisted among individuals who were overweight or obese. As well, subgroup analysis showed that, study type, region, age, and body mass index were sources of heterogeneity.

**Conclusion:** Our results highlighted the proposed role of inflammatory potential of diet as important risk factor for total and site-specific cancer. Adherence to an anti-inflammatory dietary pattern should be recommended to reduce incidence of total and site-specific cancer.

**Keywords:** Empirical Dietary Inflammatory Pattern, EDIP, Cancer, systematic review, meta-analysis



## INVESTIGATING THE EFFECT OF POMEGRANATE SEED OIL SUPPLEMENTATION ON OXIDATIVE STRESS INDICATORS IN DIABETIC PATIENTS

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**Background and Aim:** Diabetes is one of the most common chronic diseases in the world. As a chronic disease, diabetes affects all organs and systems of the body, and retinopathy, neuropathy, nephropathy and cardiovascular diseases are the main causes of death in diabetes due to micro and macro vascular complications. Oxidative stress and inflammation play a role in the development of obesity and metabolic syndrome. On the other hand, obesity is associated with an increased risk of metabolic syndrome, type 2 diabetes, high blood pressure, and cardiovascular disease. Oxidative stress caused by hyperglycemia is the main cause of diabetes complications. This systematic review was aimed at relevant articles on humans and animals to investigate the effect of PSO on improving health status.

**Methods:** The data of this research were collected from articles published in reliable databases including PubMed and Google Scholar on the effect of pomegranate seed oil on serum oxidative stress indicators from 2013 to 2023.

**Results:** Investigations showed that pomegranate seed oil (PSO) has antioxidant effects by reducing the end product of lipid peroxidation (MDA) and increasing glutathione peroxidase (GPX) and reducing inflammatory factors by reducing TNF- $\alpha$  and  $\delta$ -IL, leading to anti-oxidative stress properties and for this reason it can be said that PSO shows useful biological activities such as anti-cancer, anti-diabetes, anti-obesity, antioxidant and anti-viral properties, most of these properties are due to its puniolic acid (PuA) composition.

**Conclusion:** Pomegranate seed oil has anti-oxidative stress and anti-diabetic effects through several mechanisms, including the reduction of inflammatory cytokines and antioxidant properties.

**Keywords:** puniolic acid; pomegranate seed oil; diabetes; Oxidative stress



## THE EFFECTS OF ZINC SULFATE SUPPLEMENTATION ON SERUM COPEPTIN, C-REACTIVE PROTEIN AND METABOLIC MARKERS IN ZINC-DEFICIENT DIABETIC PATIENTS ON HEMODIALYSIS: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL

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**Background and Aim:** We aimed to investigate the association between zinc (Zn) supplementation and serum levels of copeptin, high-sensitive C-reactive protein (hs-CRP), glycemic control, anthropometric parameters and renal function in Zn -deficient diabetic hemodialysis patients (DHPs).

**Methods:** This randomized, double-blind, placebo-controlled trial (RCT) was conducted on 46 DHPs with Zn-deficiency. The Zn supplement group (n = 21) received a 220-mg/day Zn sulfate capsule (containing 50 mg Zn), and the control group (n = 25) received a placebo capsule (220 mg corn starch), for 8 weeks. Fasting, predialysis blood samples were taken at baseline and after 8 weeks to assess fasting blood glucose (FBG), serum insulin, copeptin, high-sensitive C-reactive protein (hs-CRP), blood urea nitrogen (BUN), creatinine (Cr) concentrations, and homeostatic model assessment (HOMA-IR) and quantitative insulin-sensitivity check index (QUICKI).

**Results:** Compared to controls, serum copeptin (P < 0.001), hs-CRP (P < 0.001), BUN (P < 0.001), Cr (P < 0.001), Zn (P < 0.001), FBG (P < 0.001) levels, BMI (P < 0.001), and body weight (P < 0.001) were significantly affected following ZnSO<sub>4</sub> supplementation for 8 weeks. In contrast, QUICKI (P = 0.57), HOMA-IR (P = 0.60), and serum insulin (P = 0.55) were not affected following Zn supplementation in comparison with patients receiving placebo.

**Conclusion:** Zn sulfate supplementation appears to have favorable effects on serum copeptin and hs-CRP, FBG, and renal function in Zn-deficient DHPs.

**Keywords:** Zinc . Copeptin . Diabetic nephropathy . Glycemic indices . Inflammation.





## THE IMPACTS OF ORAL NUTRITIONAL SUPPLEMENTS IN PATIENTS WITH CANCER DURING CHEMO (RADIO)THERAPY: A SYSTEMATIC REVIEW

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**Background and Aim:** Regarding to cancer-induced metabolic changes and/or symptoms that can reduce appetite and food intake, malnutrition is likely to occur in cancer patients. This adversely impacts the weight, treatment tolerance, and survival. Therefore, in the treatment of cancer, nutritional supplements play a significant role in reducing side effects and enhancing clinical outcomes. Guidelines recommend the administration of oral nutritional supplements (ONS) to patients who are malnourished or at risk of malnutrition. The function of ONS is to improve nutritional intake, increase weight, and lower the risk of complications and readmission. Considering that many studies have been conducted in this area but no conclusive results have been obtained yet, we have performed this systematic review of randomized controlled trials (RCTs) on this topic. Hence, the purpose of this study was to examine the effect of ONS on weight in cancer patients receiving chemo(radio)therapy. So we reviewed data on ONSs during chemo(radio)therapy.

**Methods:** Search was performed until 2023 using PubMed and Web of Science. Databases were screened for search terms in titles and abstracts, related to cancer, chemo(radio)therapy and various types of ONSs.

**Results:** Initial search revealed a total of 1723 publications; then, after omitting duplicates and screening the remaining, 15 trials were included.

**Conclusion:** We assessed the clinical effectiveness of any type of ONS on weight in cancer patients undergoing chemo(radio)therapy. Overall, this systematic review demonstrates that ONS during chemo/radiotherapy has a positive impact on weight.

**Keywords:** chemo(radio)therapy, oral nutritional supplements (ONS), cancer



## THE EFFECTS OF GUT MICROBIOTA CHANGES IN SUCCESSFUL RATE OF BARIATRIC SURGERY OUTCOMES

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**Background and Aim:** The present review aims to understand the possible association between GM and BS outcomes and present scientific evidence showing the beneficial role of gut microbiota in improving therapeutic outcomes of bariatric surgery.

**Methods:** The PubMed, Scopus, and Web of Science databases were searched for articles published in the last ten years. The 12 clinical trials were included after the exclusion criteria were applied. The included studies investigated the influence of GM alterations on host metabolism and the contribution of gut microbiota-derived metabolites

**Results:** The literature has shown that a lower Firmicutes/Bacteroidetes ratio is associated with greater weight loss and metabolic improvement. A higher Akkermancia muciniphila, Proteobacteria, and Roseburia intestinalis abundance were related to improved insulin sensitivity and higher remission of type 2 diabetes (T2DM). In addition to intestinal bacteria, microbial metabolites appear to play an important role in physiological and health changes regardless of the surgical procedure. Metabolites derived from microbial metabolism, including short-chain fatty acids, secondary bile acids, betaine, and choline, may act synergistically and beneficially in human metabolism and BMI reduction after BS

**Conclusion:** GM after BS has been considered a factor associated with metabolic improvements, weight loss, and lowering the adverse events post-bariatric surgery. Therefore, several prebiotics, probiotics, and postbiotics interventions could be effective therapeutic strategies for patients who underwent bariatric surgery procedures for better clinical outcomes.

**Keywords:** Bariatric surgery; Severe Obesity; Gut microbiota; Gut microbiome; intestinal microbial flora.



## INVESTIGATING THE EFFECT OF CAFFEINE ON HAIR LOSS IN MEN AND WOMEN DUE TO ALOPECIA

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**Background and Aim:** Androgenic alopecia (AGA) is a genetic condition in which both men and women experience hair loss differently. It is also known as female pattern hair loss and is characterized by a decrease in hair density across the crown and front of the head. On the other hand, alopecia is the most common type of hair loss in men and women, which occurs in 57% of women up to the age of 80. It also affects approximately 50% of men in their 50s.

**Methods:** The data of this research was collected from articles published in reliable databases including PubMed and Google Scholar on the effect of caffeine on hair loss in alopecia from 2007 to 2023.

**Results:** Studies have shown that caffeine is a phosphodiesterase inhibitor, increasing levels of cyclic adenosine monophosphate in cells, thereby promoting cell proliferation by stimulating cell metabolism, a mechanism that may counteract testosterone-induced hair follicle shrinkage. Caffeine has also been shown to penetrate the hair follicle even when used as a shampoo formulation, meaning caffeine penetrates more effectively through the follicular route compared to the dermal route.

**Conclusion:** Caffeine has anti-alopecia with several mechanisms, including the movement of cell metabolism and penetration into the hair follicle.

**Keywords:** Caffeine; Alopecia; Hair loss; Hair follicle



## HOUSEHOLD FOOD INSECURITY AND SOME CORRESPONDING FACTORS IN THE NORTH EAST COMPARED TO THE SOUTH EAST OF IRAN

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**Background and Aim:** To investigate the level of food insecurity among households in Birjand and Gorgan, and to compare the extent, severity, and factors influencing food insecurity in these cities.

**Methods:** After a training course, health experts completed a standard Household Food Insecurity Access Scale (HFIAS) questionnaire and recorded the GPS location of the households. Questionnaires entered a the "Samat" system. The data extracted from Samat were transferred to SPSS 26 software and the descriptive and analytical results of Anova, Shapiro-Wilk, t-Welch, Chi-square statistical tests were reported in the form of frequency distribution tables and mean and standard deviation.

**Results:** A total of 1025 households from Gorgan and 1656 households from Birjand were included in the study. It was found that 45.5% of households in Gorgan and 62% of households in Birjand experienced some degree of food insecurity ( $P < 0.001$ ). The proportion of rural families experiencing food security was lower than that of urban families ( $P < 0.001$ ). Among both urban and rural groups, the majority of households fell into the food security or mild food insecurity categories. There was a positive correlation between the head of the household's better job and higher education level and greater food security ( $P = 0.0001$ ). In both cities, larger household size increased the likelihood of food insecurity within the family.

**Conclusion:** Food insecurity is closely linked to income, the education level of the head of the household, and the size of the household. The employment status and literacy of household heads play an essential role in reducing food insecurity.

**Keywords:** Food insecurity; Household head; Malnutrition; Gorgan; Birjand



## DOES VITAMIN D INTAKE IMPACT SEROTONIN LEVELS? A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Insufficient levels of vitamin D impact a significant proportion of the world's population, and this deficiency has been linked to various conditions characterized by imbalanced serotonin regulation. The objective of this systematic review and meta-analysis was to evaluate the effect of vitamin D supplementation on serotonin serum levels.

**Methods:** We conducted a comprehensive search of PubMed, Scopus, Cochrane Central for Randomized Clinical Trials, and Web of Science up to September 2022, without any language restrictions. The effect sizes were calculated using the standard mean difference (SMD) and 95% confidence interval (CI).

**Results:** Six randomized clinical trials involving 356 participants were included in the analysis. Our findings indicated no significant changes in serotonin levels between the intervention and control groups (SMD: 0.24 ng/mL, 95% CI: -0.28, 0.75,  $p > 0.05$ ). Subgroup analysis also did not reveal any significant changes in serotonin levels among children, participants with autism spectrum disorders, interventions lasting 10 weeks or longer, or those receiving vitamin D doses below 4000 IU/d.

**Conclusion:** Although the results obtained are inconclusive, they support the need for further well-designed randomized trials to assess the potential role of vitamin D supplementation in regulating serotonin levels and potentially ameliorating depression and related disorders.

**Keywords:** Serotonin, 5-HT, vitamin D, cholecalciferol, systematic review, meta-analysis



## MITOCHONDRIAL ENERGY EXPENDITURE BIOMARKERS FOLLOWING BARIATRIC SURGERY: A 6-MONTHS PROSPECTIVE COHORT STUDY

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**Background and Aim:** Mitochondria dysfunction is recognized as the major causes of insulin resistance, and other countless complications of obesity. PGC-1 $\alpha$ , and UCP-2 play key roles in energy expenditure regulation in the mitochondrial thermogenesis. This study aimed to investigate the effect of bariatric surgery on key pathways in energy homeostasis, and to assess the potential predictive role of body composition and metabolic parameters in this regard.

**Methods:** 45 patients with morbid obesity underwent Roux-en-Y gastric bypass surgery. The patients have evaluated three-time points at baseline, three, and six months after the surgery. body composition components, the levels of PGC-1 $\alpha$ , UCP-2 were measured three times during this study.

**Results:** The PGC-1 $\alpha$  and UCP-2 had a significant increase three and then six-month post-operation compared with the baseline. Moreover, multivariate linear regression analysis identified that the changing trend of PGC-1 $\alpha$  was associated with insulin, Uric Acid, HOMA-IR, fat mass (kg) and trunk fat (kg) and UCP-2 was associated with TSH, AST, Fat (kg) and FFM.

**Conclusion:** Bariatric surgery had a beneficial effect on changes in UCP-2 and PGC-1 $\alpha$  levels as well as body composition and metabolic parameters. Accordingly, bariatric surgery possibly could increase thermogenesis and energy expenditure, through its significant effects on the improvement of mitochondrial biogenesis and function.

**Keywords:** Bariatric Surgery, PGC-1 $\alpha$ , UCP-2, Body Composition, Mitochondrial Biogenesis, Energy



## EVALUATION OF NUTRITIONAL STATUS BEFORE AND AFTER OBESITY SURGERY

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**Background and Aim:** This study was conducted to evaluate and compare the amount of food intake, physical activity, and body composition before and after bariatric surgery using three surgical methods: bypass, mini bypass, and sleeve.

**Methods:** In this open clinical trial study, 120 participants were selected from the patients who had been already referred to the obesity clinic of Firoozgar Hospital in Tehran, Iran for bariatric surgery, from April to June 2017. In this study, standard questionnaires were used to collect information. Paired sample t-test, ANOVA, and McNemar tests were also used. Patients' nutritional and mental status was assessed before and one year after obesity surgery. Only 24 people were excluded from the study due to lack of cooperation.

**Results:** This study showed that the body composition and level of physical activity of patients improved significantly after surgery. The results indicated that there was no significant relationship between the mean difference in food intake before and after 3 obesity surgeries ( $p > 0.05$ ).

**Conclusion:** It seems that the bariatric surgery methods considered in this study had significant effects in improving the nutritional status, but in terms of determining the best bariatric surgery method with the least nutritional complications, more studies should be done.

**Keywords:** obesity surgery, food intake, body composition.



## ANALYSIS FOR POLICY: SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM TO REDUCE THE FOOD INSECURITY OF THE ELDERLY

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**Background and Aim:** Food insecurity affects millions of elderly individuals. The purpose of this study is to examine the Supplementary Nutrition Assistance Program (SNAP) as a proposed solution to address food insecurity among the elderly and to consider incorporating this policy.

**Methods:** This policy was analyzed using the Health Policy Triangle framework, and the HALL model was employed for policy implementation.

**Results:** Since the supplementary nutrition assistance program is one of the most successful worldwide, a pilot program could be implemented for one year in the most deprived provinces (2 provinces) for seniors covered by the Welfare Organization. They would receive 300,000 Tomans monthly on a card or voucher for purchasing food, along with nutrition education at health centers. Selection of items such as rice or pasta from the grains group, eggs or legumes from the protein group, etc., would be limited by the elderly or households with elderly members. After assessing its effectiveness and securing the budget, the program could be extended to other deprived provinces. Strategic objectives in national documents, including the National Nutrition and Food Security Document, emphasize reducing malnutrition in the elderly (high legitimacy). This policy has strong community support. Additionally, due to the possibility of providing credit cards or special vouchers in health homes or night/day centers, providing services to elderly individuals is feasible.

**Conclusion:** The supplementary nutrition assistance program can be recommended as an effective policy to prevent elderly food insecurity and its consequences.

**Keywords:** Elderly, Supplementary Nutrition Assistance Program, Malnutrition





## THE EFFECT OF HIGH INTENSITY INTERVAL TRAINING AND THYME EXTRACT ON OXIDATIVE STRESS FACTOR IN DIABETIC RATS

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**Background and Aim:** The prevalence of type 2 diabetes is increasing due to lifestyle changes, increasing prevalence of obesity and inactive physical activity, and glucose modulation is of great importance in these individuals. Thyme was studied on type 2 diabetic rats by streptozotocin and high fat diet.

**Methods:** Male Wistar rats weighing  $110 \pm 10$  g were used in this study. The rats were randomly divided into four groups of Thymus + Exercise, Thymus, Exercise and Control groups. The extract was taken 200 g daily through a gavage syringe. Exercise included: Running on a treadmill at a speed of at least 20 m / min and a maximum of 38 m / min for 60 minutes daily, 5 days a week, for 8 weeks. Serum malondialdehyde (MDA) was measured by ELISA method

**Results:** Serum MDA levels were significantly higher in the control group ( $p = 0.002$ )

**Conclusion:** Intermittent exercise (HIIT) and thyme extract can improve oxidative stress in diabetic rats.

**Keywords:** High-Intensity Interval Training, Oxidative Stress, Antioxidants, Thymus Plant, Diabetes



## EFFECTS OF SYNBIOTIC SUPPLEMENTATION ON CARDIOMETABOLIC AND ANTHROPOMETRIC INDICES IN PATIENTS WITH METABOLIC SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Probiotic and synbiotic products are widely employed by a great number of patients and physicians; However, implications for cardiometabolic indices in patients with metabolic syndrome remain unclear. This meta-analysis aimed to assess the effects of synbiotic intervention on lipid profile, insulin resistance, blood pressure, anthropometric parameters, and inflammatory markers.

**Methods:** Materials and Methods: We searched MEDLINE, Scopus, and Clarivate Analytics Web of Science up to October 2021. Studies were selected if they reported the efficacy of synbiotic intervention on cardiometabolic and anthropometric indices. The weighted mean difference was calculated as an effect size employment of a random-effects model. Subgroup analyzes were performed to determine sources of heterogeneity. Dose-related effects were assessed using a dose-response meta-analysis of mean differences.

**Results:** In the meta-analysis of five studies (1049 participants), synbiotic intervention was found to have significant effects. It reduced serum insulin levels, triglycerides, total cholesterol, low-density lipoprotein cholesterol, waist circumference, body weight, systolic blood pressure, and serum interleukin-6 concentrations. It also resulted in elevated levels of high-density lipoprotein cholesterol. However, synbiotic administration did not have a significant impact on fasting plasma glucose, homeostatic model assessment for insulin resistance, body mass index, diastolic blood pressure, heart rate, and serum C-reactive protein concentrations.

**Conclusion:** The present results suggest that synbiotic intervention effectively improves cardiometabolic risk factors in patients with metabolic syndrome. Impact of walnut consumption on cardiometabolic and anthropometric parameters in patients with metabolic syndrome: GRADE-graded systematic review and dose-response meta-analysis of data from randomized control trials.

**Keywords:** Cardiometabolic; Meta-analysis; Metabolic syndrome; Synbiotic; Systematic.



## THE ASSOCIATION BETWEEN MATERNAL BODY MASS INDEX BMI AND BREAST MILK COMPOSITION: A SYSTEMATIC REVIEW.

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**Background and Aim:** Context: Breast milk composition is influenced by many factors ranging from maternal nutritional status to infant sex. Previous studies have explored the relationship between maternal body mass index (BMI) and breast milk composition; however, the findings have been inconsistent and controversial. Objective: To systematically review the evidence on the association of maternal weight and BMI with breast milk composition.

**Methods:** Data Sources: PubMed and Scopus were searched till 3 May 2023 with the following search strategy: ("maternal weight" OR "maternal BMI" OR "mother's weight" OR "mother's BMI") AND ("maternal milk" OR "human milk" OR "breast milk"). Data Extraction: A total of 83 publications, involving data from over 11310 lactating women were identified. All extracted data were compiled, compared, and critically analyzed.

**Results:** Data Analysis: Overall, maternal BMI was associated with higher levels of leptin, insulin, and the Omega-6/ Omega-3 ratio in breast milk. However, no conclusive associations were found between maternal BMI and the levels of energy, macronutrients, micronutrients, and other components of breast milk.

**Conclusion:** Conclusions: This systematic review provides robust evidence supporting a positive correlation between maternal BMI and breast milk concentrations of leptin, insulin, and the Omega-6/ Omega-3 polyunsaturated fatty acid (PUFA) ratio. Nevertheless, disparities in findings are noticeable when it comes to other constituents of breast milk. To comprehensively grasp the influence of maternal weight and BMI on breast milk composition, further research endeavors are imperative.

**Keywords:** Breast milk, Human milk, BMI, Weight, Nutrients



## THE SUPPLEMENTATION OF CURCUMIN NANO-MICELLES AND/OR NIGELLA SATIVA WITH THE SUPERIORITY OF CO-SUPPLEMENTATION COULD MODULATE THE INFLAMMATORY BIOMARKERS IN POSTMENOPAUSAL WOMEN: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** The present study aimed to evaluate the efficacy of Curcumin Nano-micelles (CUR), Nigella Sativa (NS), and co-supplementation of Nigella Sativa-Curcumin Nano-micelles (NS-CUR) on inflammatory biomarkers in postmenopausal women with primary osteoporosis or osteopenia.

**Methods:** In this triple-blind randomized clinical trial, 120 postmenopausal women aged 50 to 65 years old were randomly assigned into four groups stratified by bone density. During 6-month intervention, participants in the NS group consumed an NS oil capsule and a CUR placebo capsule daily. Participants consumed a CUR capsule and an NS placebo daily in the CUR group. The NS-CUR group consumed a CUR capsule and an NS oil capsule daily. The placebo group also received two placebo capsules per day. The serum levels of the tumor necrosis factor-alpha (TNF- $\alpha$ ), interleukin 6 (IL-6), and high sensitivity C reactive protein (hs-CRP) were assessed before and after the intervention.

**Results:** The serum levels of TNF- $\alpha$ , IL-6, and hs-CRP significantly decreased within NS ( $p < 0.001$ ), CUR ( $p < 0.001$ ,  $p < 0.001$ ,  $p = 0.001$ , respectively) and NS-CUR ( $p < 0.001$ ) groups compared to the baseline. Between-group analyses revealed that TNF- $\alpha$  and IL-6 significantly decreased in all groups of NS ( $p < 0.001$ ), CUR ( $p < 0.001$ ), and NS-CUR ( $p < 0.001$ ) compare to placebo. Despite the significant difference of hs-CRP in NS and NS-CUR groups ( $p = 0.001$ ,  $p < 0.001$ , respectively) no significant differences were observed between the CUR and placebo ( $p = 0.096$ ).

**Conclusion:** The supplementation of CUR, NS, and NS-CUR could modulate the inflammatory biomarkers of TNF- $\alpha$ , IL-6, and hs-CRP. Moreover, co-supplementation of NS and CUR exhibits more strong effects on inflammatory biomarkers.

**Keywords:** Nigella Sativa; Curcumin Nano-micelles; Inflammatory biomarkers; Postmenopausal osteoporosis; Postmenopausal osteopenia



## THE EFFECTS OF NIGELLA SATIVA AND CURCUMIN SUPPLEMENTATION ON OXIDATIVE STRESS BIOMARKERS IN POSTMENOPAUSAL WOMEN WITH PRIMARY OSTEOPOROSIS OR OSTEOPENIA: A TRIPLE BLIND FACTORIAL RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** The aim of this study was to evaluate the effects of Nigella sativa (NS) and Curcumin (CUR) supplementation on oxidative stress biomarkers in postmenopausal women with primary osteoporosis or osteopenia

**Methods:** In this randomized controlled trial, using a triple blind factorial design, 120 postmenopausal women with primary osteoporosis or osteopenia were randomly allocated to four groups, namely the NS, CUR, NS + CUR, and placebo groups. Participants in these groups daily received one NS oil capsule and one CUR placebo capsule, one nanomicelle CUR and one NS placebo capsule, one NS oil capsule and one nanomicelle CUR capsule, and two placebo capsules, respectively. The intervention lasted for 6 months

**Results:** SOD serum level significantly increased in the NS and the NS + CUR groups and its posttest value in the NS + CUR group was significantly more than the placebo group (mean differences = 100.4, 95% confidence interval = 21.9–178.9;  $P = 0.013$ ). TAC serum level significantly increased in the NS + CUR group and its posttest value in this group was significantly more than the placebo group (mean difference = 0.23; 95% confidence interval = 0.05–0.41;  $P = 0.011$ ). No significant change was observed in MDA serum level in any of the study groups ( $P > 0.05$ )

**Conclusion:** CUR is probably ineffective in significantly reducing oxidative stress, while NS can relatively alleviate oxidative stress and NS + CUR can considerably alleviate oxidative stress in postmenopausal women with primary osteoporosis or osteopenia

**Keywords:** Curcumin; Nigella sativa; Oxidative stress; Postmenopausal osteoporosis; Postmenopausal osteopenia



## CLINICAL EFFICACY OF CURCUMIN AND VITAMIN E ON INFLAMMATORY-OXIDATIVE STRESS BIOMARKERS AND PRIMARY SYMPTOMS OF MENOPAUSE IN HEALTHY POSTMENOPAUSAL WOMEN: A TRI-PL- BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** The present study was conducted to find out whether supplementation with curcumin and vitamin E affects inflammatory-oxidative stress biomarkers and primary symptoms of menopause in healthy postmenopausal women

**Methods:** This study is a triple-blind parallel randomized controlled trial. Eighty-four postmenopausal women were randomly assigned into three groups using block randomization. The curcumin group received one capsule containing 500 mg curcumin twice a day, the vitamin E group received one 500 mg capsule of vitamin E twice a day, and the placebo group took two placebo capsules containing 500 mg of microcrystalline cellulose daily for eight weeks

**Results:** Eighty-one participants completed the trial. There were no significant differences in demographic characteristics and dietary intake (except for vitamin C intake,  $P=0.023$ ) between the groups at baseline. The mean  $\pm$  SD score of total menopause symptoms, depression, anxiety, psychological, vasomotor, and physical domains significantly decreased within all groups ( $P<0.05$ ). Between-group analyses indicated that decreasing the mean score of anxiety in the vitamin E group was significantly more than in the placebo group ( $P=0.026$ ). The mean (SD) serum levels of MDA and hs-CRP significantly decreased only in the curcumin group ( $P=0.009$  and  $P=0.025$ , respectively). Serum levels of TAC significantly increased in curcumin and vitamin E groups ( $P<0.001$  and  $P=0.006$ , respectively)

**Conclusion:** Curcumin could improve the oxidative stress (MDA and TAC) and inflammatory (hs-CRP) biomarkers. Vitamin E may also improve the antioxidant status by increasing the TAC levels. The alleviation of anxiety in the vitamin E group was more than in the placebo group

**Keywords:** Curcumin; Vitamin E; Inflammation; Oxidative stress; Menopause symptoms



## THE ASSOCIATION BETWEEN DIETARY INTAKE, PHYSICAL ACTIVITY, THE BUILT ENVIRONMENT, AND SOCIO-ECONOMIC CHARACTERISTICS WITH DEPRESSION, ANXIETY, AND STRESS

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**Background and Aim:** Depression and anxiety are ranked as the fourth leading causes of global illness burden, contributing significantly to non-fatal disease burden. Various factors, including diet, physical activity, the built environment, and socio-economic status, play a role in mental health, both directly and indirectly.

**Methods:** This investigation was conducted within the Persian cohort of Mashhad. A geographic information system (GIS) map was created to assess the participants' built environment. The diet quality index (DQI) was used to evaluate diet quality. Questionnaires from the Persian Cohort were utilized to assess participants' weight, physical activity (P.A), and socioeconomic level. The Depression, Anxiety, and Stress Scale (DASS) method was employed to measure stress, anxiety, and depression levels among all study participants. The relationships in the structural model were analyzed using partial least squares structural equation modeling (PLS-SEM).

**Results:** This study includes 7431 participants. Female gender ( $P<0.05$ ) and single marital status ( $P<0.001$ ) were found to have a positive association with mental disorders. Mental disorders, on the other hand, were negatively linked with DQI ( $P<0.001$ ), and SES ( $P<0.001$ ). The built environment had no direct relationship with mental disorders, and there was no substantial relationship between the built environment and physical activity or DQI.

**Conclusion:** Food intake and socio-economic status directly influence depression, anxiety, and stress among personnel at Mashhad University of Medical Sciences. Socio-economic status has the most substantial and significant impact. To reduce the prevalence of depression, anxiety, and stress, it is crucial to enhance economic access and promote literacy and awareness.

**Keywords:** Food intake, Built environment, Depression, stress, Anxiety, Socio-economic status



## THE ASSOCIATION OF MEAL-SPECIFIC TOTAL FAT INTAKE AND FAT QUALITY INDEX WITH CARDIOMETABOLIC RISK FACTORS AMONG IRANIAN ADULTS

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**Background and Aim:** We aimed to investigate the association between meal-specific total fat intake and fat quality index (FQI) with cardiometabolic risk factors in healthy adults living in Tehran.

**Methods:** This cross-sectional study included 825 adults aged 20-60 years old. Dietary intake was recorded using 24-hour recalls for three non-consecutive days, and anthropometric measurements were performed by experienced dietitians. Multivariate logistic regression was applied to assess the odds ratio (OR) of cardiometabolic risk factors.

**Results:** The mean (SD) age was 42.25 ( $\pm 10.54$ ) years. The odds of low high-density lipoprotein (HDL) level increased from the first tertile to the highest tertile of fat intake at lunch (OR = 1.69, 95% CI = 1.19-2.40) and dinner (OR = 1.87, 95% CI = 1.27-2.73). The highest category of the lunch-specific FQI compared with the other two categories may cause an increase in body mass index (P-value = 0.03). Also, there was a significant increase of TC from the first tertile to the highest tertile of FQI at breakfast meal (OR = 1.17, 95% CI = 0.80-1.70). Moreover, within lunch meals, FQI was associated with higher odds of having general obesity (OR = 1.94, 95% CI = 1.29-2.95).

**Conclusion:** We found that a higher intake of fat intake at dinner and lunch may be related to lower HDL levels. Also, people with a higher FQI at lunch and breakfast may experience a greater chance of general obesity and higher TC levels, respectively. Additional trials are needed to further explore these associations.

**Keywords:** Meal-specific fat intake; Fat quality index; Cardiometabolic risk factors; Obesity.





## THE EFFECTS OF OLIVE OIL CONSUMPTION ON BLOOD LIPIDS: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** We performed a systematic review and dose-response meta-analysis of randomized trials on the effects of olive oil consumption on blood lipids in adults.

**Methods:** A systematic search was performed in PubMed, Scopus, and Web of Science databases until May 2021. Randomized controlled trials (RCT) evaluating the effect of olive oil intake on serum total cholesterol (TC), triglyceride, low- (LDL-C) and high-density lipoprotein cholesterol (HDL-C) in adults were included. The mean difference (MD) and 95%CI were calculated for each 10 g/d increment in olive oil intake using a random effects model.

**Results:** A total of 34 RCTs with 1730 participants were included. Each 10 g/d increase in olive oil consumption had minimal effects on blood lipids including TC (MD: 0.79 mg/dL; 95%CI: -0.08, 1.66; I<sup>2</sup>=57%; n=31, GRADE=low certainty), LDL-C (MD: 0.04 mg/dL, %95CI: -1.01, 0.94; I<sup>2</sup>=80%; n=31, GRADE=very low certainty), HDL-C (MD: 0.22 mg/dL; %95CI: -0.01, 0.45; I<sup>2</sup>=38%; n=33, GRADE=low certainty), and triglycerides (MD: 0.39 mg/dL; 95%CI: -0.33, 1.11; I<sup>2</sup>=7%; n=32, GRADE=low certainty). Levels of TC increased slightly with the increase in olive oil consumption up to 30 g/d (MD<sub>30g/d</sub>: 2.76 mg/dL, 95%CI: 0.01, 5.51), and then appeared to plateau with a slight downward curve. A trivial nonlinear dose-dependent increment was seen for HDL-C, with the greatest increment at 20 g/d (MD<sub>20g/d</sub>: 1.03 mg/dL, 95%CI: -1.23, 3.29).

**Conclusion:** Based on existing evidence, olive oil consumption had trivial effects on levels of serum lipids in adults. More large-scale randomized trials are needed to present more reliable results.

**Keywords:** Dose-response; Lipid profile; Olive oil consumption; Randomized control trial studies.



## THE EFFECT OF LIFESTYLE MODIFICATION ON THE RECOVERY OF NON-ALCOHOLIC FATTY LIVER DISEASE IN HEALTH INSURANCE STAFF IN TABRIZ, IRAN: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** NAFLD is among the most common liver diseases. In recent years, the prevalence of fatty liver disease has been mostly attributed to obesity, an unhealthy lifestyle, and poor eating habits. This study aimed to evaluate the effect of lifestyle modification on the recovery of NAFLD in health insurance staff in Tabriz, Iran

**Methods:** This study was conducted on 42 male and female NAFLD patients aged 20 to 55. The participants were randomly divided into intervention (diet along with aerobic exercise) (n=21) and control (n=21) groups. The level of disease recovery was evaluated by measuring the level of liver enzymes, liver ultrasound, and BMI before and after three months of intervention. Paired and independent t-test, Mann-Whitney U test, and Wilcoxon test were performed using SPSS version 22 software. The clinical significance of the study was estimated using an epidemiological tool known as the number needed to treat (NNT)

**Results:** In the end of study, decrease in BMI index in the intervention group was insignificant compared to the control group. The degree of liver recovery in the intervention and control groups was calculated to be 69.9% and 33.3%, respectively. Also, the decrease in fatty liver grade in the intervention group was significant compared to the control group (P = 0.028). There was a statistically significant reduction in the severity of fatty liver disease in the intervention group at the end of the research (NNT = 3.5)

**Conclusion:** This study showed that lifestyle modifications, such as physical activity and dietary habits, significantly affected fatty liver in NAFLD patients.

**Keywords:** Lifestyle, Modification, Recovery, NAFLD



## CHRONIC AND ACUTE EFFECTS OF COCOA PRODUCTS INTAKE ON ARTERIAL STIFFNESS AND PLATELET COUNT AND FUNCTION: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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**Background and Aim:** The findings of trials investigating the effect of cocoa products consumption on vascular stiffness and platelet are controversial. The aim of this study is to summarize the findings on the acute and chronic effects of different forms of cocoa on the risk factors of cardiovascular disease.

**Methods:** We searched SCOPUS, Pub Med and Web of Science from inception to Jan 2020. Finally, the random-effect model was used to report the pooled effect sizes. Results are expressed as weighted mean difference (WMD) with 95% confidence intervals (CI).

**Results:** Overall, 41 trials were included, of which only 14 studies met the eligibility criteria for analysis, including 11 long-term RCTs (more than a week was considered as a chronic phase) and 7 short-term RCTs (less than a week was considered as an acute phase). According to the result of 11 long-term RCTs, cocoa products had a negative significant effect on pulse wave velocity; PWV (WMD:  $-0.33$  m/s,  $P < 0.05$ ).

**Conclusion:** Current study indicated the beneficial effect of acute and chronic consumption of cocoa-based products ingestion on platelet function and arterial stiffness in healthy adult regardless of age especially in male and for consumption ( $\leq 4$  weeks) in the chronic intake and ( $\leq 120$  minutes) in acute intake, but did not affect on platelet count.

**Keywords:** Chocolate; Cocoa; Arterial stiffness; Platelet; Meta-analysis



## THE INTERACTION EFFECT OF ANXIETY AND MOOD ON CALORIE INTAKE AND BLOOD PRESSURE IN HEALTHY UNIVERSITY STUDENTS

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**Background and Aim:** Despite the importance of food intake in weight management and preventing chronic diseases, it remains difficult to predict how anxious people change their eating behavior in exposure to bad or good moods. The aim of the study was to investigate the interaction effect of anxiety and different moods on food intake and blood pressure in healthy students

**Methods:** 82 female university students (18-30 years) participated in the study. Subjects completed a valid anxiety questionnaire at baseline to measure trait and state anxiety scores then they were randomly divided into two groups to watch comedy and drama movie for mood induction. After watching, some snacks were presented then calorie intake and blood pressure were measured.

**Results:** Students with severe level of state anxiety, which watched drama movie, consumed more calorie ( $p < 0.01$ ). Also a significant more systolic and diastolic blood pressure was observed in drama group compared to comedy, among subjects who suffer from moderate level of state anxiety ( $p = 0.043$  and  $p = 0.041$  respectively). More diastolic blood pressure was shown among students who watched drama movie and suffered from severe level of trait anxiety ( $p = 0.049$ )

**Conclusion:** It seems anxiety along with bad moods have effect on elevated calorie intake and blood pressure; that both of them are related to occurrence of chronic disorders such as cardiovascular diseases.

**Keywords:** Affect, Anxiety, Blood pressure, Eating



## EFFECTS OF MOOD INDUCTION USING MOVIE WATCHING ON FOOD INTAKE AND HORMONE LEVELS

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**Background and Aim:** There is a complex connection between emotional states and food intake. The purpose of this study was to investigate the impact of short-term emotion induction on food intake and ghrelin, cortisol and insulin levels in healthy normal-weight individuals without eating disorders

**Methods:** 89 participants were divided into two groups (drama and comedy movies). After 50 minutes of watching, the movie was stopped and blood samples were collected, and participants were offered a snack to eat.

**Results:** The visual analog scale showed that the movie watching had significant effects on mood induction. However, there was no significant relationship between the kind of movie the participants had watched and their choice of food, its calorie content or the amount of food (e.g. grams) that were consumed.

**Conclusion:** This parallel design study found that a 50- minute exposure to either a dramatic or a comedy movie affected ghrelin, cortisol and insulin levels. However, these hormonal changes were not associated with intake of food from a buffet during the last minutes of viewing.

**Keywords:** Mood, Food choice, Ghrelin, Cortisol, Insulin



## EVALUATION OF ANTHROPOMETRIC INDICATORS AND ITS RELATIONSHIP WITH SELECTED SOCIAL AND DEMOGRAPHIC VARIABLES AND PRENATAL FACTORS IN CHILDREN UNDER 5 YEARS

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**Background and Aim:** Considering the destructive effects of malnutrition on child growth, development and health and the importance of identifying the factors that influence it, the present study aimed to investigate the status of anthropometric indices and their relationship with selected social and demographic variables and prenatal factors among children under 5 years old

**Methods:** This cross-sectional study was conducted on 1552 children under 5 years old in Zahedan, Iran. The data collection instrument consisted of two parts: The first part included parents' demographic and socioeconomic information, prenatal conditions, and breastfeeding of these children. The second part was the study to calculate the anthropometric indices of the children.

**Results:** The rate of underweight, overweight, stunting and wasting were 34.8%, 5.3%, 50.3% and 7.3%, respectively. There were significant differences between boys and girls in the rates of stunting, wasting and underweight. The overall rate of stunting was significantly higher than the overall rates of underweight and wasting. There was a statistically significant association between stunting and maternal employment status. there is a significant relationship between birth weight also birth height and wasting, stunting and underweight.

**Conclusion:** Malnutrition was significant in these children and associated factors were investigated. No association was found between pregnancy factors and stunting and wasting. It seems that labor conditions, duration of breastfeeding and height and weight at birth play an important role. The main goal of future research and interventions must be to find the causes of stunting and wasting.

**Keywords:** Anthropometric indices, health, children under 5 years old



## INTERACTION BETWEEN APO A-II -265T>C POLYMORPHISM AND DIETARY TOTAL ANTIOXIDANT CAPACITY ON SOME ANTHROPOMETRIC INDICES AND SERUM LIPID PROFILE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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**Background and Aim:** The present study aimed to investigate the interaction of Apo A-II polymorphism and dietary total antioxidant capacity (DTAC) with lipid profile and anthropometric markers in patients with type 2 diabetes (T2DM) that are at risk for atherosclerosis.

**Methods:** This cross-sectional study was conducted on 778 patients with T2DM (35–65 years). Dietary intakes were assessed by a 147-item food frequency questionnaire. DTAC was computed using international databases. Participants were categorised into two groups based on rs5082 genotypes. The gene–diet interaction was analysed by an ANCOVA multivariate interaction model. Total cholesterol, TC; triacylglycerol, TG; high- and low-density lipoprotein, HDL and LDL; TC–HDL ratio; waist circumference, WC and body mass index, BMI were obtained according to standard protocols.

**Results:** We found that a significant interaction between rs5082 variants and DTAC on mean WC (PTEAC = 0.044), TC concentration (PFRAP = 0.049 and PTEAC = 0.031) and TC/HDL (PFRAP = 0.031 and PTRAP = 0.040). Among patients whose DTAC was higher than the median intake, the mean of weight, WC and TC/HDL were significantly higher only in individuals with CC genotype. Also, the high DTAC was associated with a lower TC concentration only in T-allele carriers (PFRAP = 0.042).

**Conclusion:** We found that adherence to a diet with high total antioxidant capacity can improve the complications of diabetes and atherosclerosis in the T carrier genotype more effectively than the CC genotype. These results could indicate the anti-atherogenic properties of Apo A-II. However, further studies are needed to shed light on this issue.

**Keywords:** Apolipoprotein A2: Dietary total antioxidant capacity: Interaction: Polymorphism: Antioxidant: Diabetes



## INTERACTION BETWEEN APO A-II -265T>C POLYMORPHISM AND DIETARY TOTAL ANTIOXIDANT CAPACITY ON SOME OXIDATIVE STRESS AND INFLAMMATORY MARKERS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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**Background and Aim:** This work aims to examine the interaction between Apolipoprotein A2 (Apo A-II) -265T>C single nucleotide polymorphism (SNP) and dietary total antioxidant capacity (DTAC) on inflammation and oxidative stress in patients with type 2 diabetes mellitus.

**Methods:** The present cross-sectional study included 180 patients (35-65 years) with identified Apo A-II genotype. Dietary intakes were assessed by a food frequency questionnaire. DTAC was computed using the international databases. Interleukin-18 (IL18), high-sensitivity C-reactive protein (hs-CRP), and pentraxin (PTX3), serum total antioxidant capacity (TAC), superoxide dismutase activity (SOD), and 8-isoprostane F<sub>2α</sub> (PGF<sub>2α</sub>) markers were obtained according to standard protocols. General linear model was used to evaluate the interaction.

**Results:** The interaction of gene and DTAC (PFRAP = 0.039 and PORAC = 0.042) on PGF<sub>2α</sub> level was significant after adjusting for confounders. A significant interaction was observed on IL18 level (PORAC = 0.018 and PFRAP = 0.048) and SOD (PTEAC = 0.037) in obese patients. Among patients whose DTAC was higher than the median intake, the levels of hs-CRP and PGF<sub>2α</sub> were significantly higher only in individuals with CC genotype. Serum TAC (PFRAP = 0.030, PORAC = 0.049) and SOD were significantly lower in the CC genotype. There was a favourable relationship between the high-DTAC and SOD and PGF<sub>2α</sub> in T-allele carriers.

**Conclusion:** The rs5082 SNP interacts with DTAC to influence several cardiometabolic risk factors. Also, we found dietary recommendations for antioxidant-rich foods intake might be useful in the prevention of diabetes complications in the T carrier more effectively than the CC genotype

**Keywords:** Apo A2; Dietary total antioxidant capacity; Interaction; Polymorphism.





## THE RELATIONSHIP BETWEEN ADHERENCE TO THE MEDITERRANEAN DIETARY PATTERN DURING EARLY PREGNANCY AND BEHAVIORAL, MOOD AND COGNITIVE DEVELOPMENT IN CHILDREN UNDER 1 YEAR OF AGE: A PROSPECTIVE COHORT STUDY

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**Background and Aim:** To investigate the potential relationship between diet quality, represented by the Mediterranean diet score, during early pregnancy and behavioral, mood, and cognitive development in children under 1 year of age in a prospective cohort study in Iran.

**Methods:** 658 Iranian pregnant women and their infants participated in this prospective birth cohort study. The Mediterranean diet score was calculated by using data from a food frequency questionnaire during the first trimester of pregnancy. We assessed the children's development using the Ages and Stages Questionnaire (ASQ) at 6-month age. We used Cox proportional hazard model to calculate the hazard ratio (HR) and 95% confidence interval (CI) of ASQ domains across categories of the Mediterranean diet score.

**Results:** The mean age of the mothers was  $28.8 \pm 5.08$  years old, and the average follow-up duration was 90 weeks. The mean BMI of the mothers before pregnancy was  $25.1 \pm 4.43$  kg/m<sup>2</sup>. In the multivariable-adjusted model, those infants whose mothers were in the second (HR: 0.44; 95% CI: 0.19, 1.04; P = 0.06) and third (HR: 0.39; 95% CI: 0.17, 0.89; P = 0.03) tertiles of the Mediterranean diet score had a lower risk of communication impairment compared to those who were at the first tertile. There was no association between maternal adherence to the Mediterranean diet during early pregnancy and other domains of the ASQ.

**Conclusion:** Greater adherence to the Mediterranean dietary pattern during the first trimester of pregnancy may be favorably associated with communication abilities at 6-month aged infants. More large-scale cohort studies are needed to confirm our findings.

**Keywords:** Dietary pattern; pregnancy; cognitive development; infancy; Mediterranean diet; age and stage questionnaire; diet.



## HEALTHY PACKAGED PREPARED MEALS AND THEIR BENEFITS : A REVIEW STUDY

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**Background and Aim:** packaged prepared meals (Prep meals) is a useful and effective way to plan, save time, improve your diet, better control meals and better manage your weight. Prepared meals are a combination of ingredients with instructions on how to prepare a healthy meal that contains a higher volume of nutritious foods such as whole grains, lean proteins. Prep Mills is a good option for those who have time, physical and resource constraints.

**Methods:** Using the keywords prep meal, nutrition, healthy, diet, and the English equivalent of these words, we found articles related to the topic from 2010 on SID, Google scholar, pubmed, and magiran sites.

**Results:** Those who used prep meals, compared to those who did not have the ability to prepare meals and did not use prep meals, had a diet containing less sodium, calories and sugar, and they were less likely to suffer from diet-related diseases such as diabetes, Blood pressure and obesity decreased.

**Conclusion:** The results show that Prep Meals is an effective nutritional intervention to improve the nutritional status and health, the favorable results of which can be seen in the short term. As a result, we recommend these pre-prepared meals for those who are not able to cook.

**Keywords:** prep meal, nutrition, healthy, diet



## EFFECTS OF VITAMIN D SUPPLEMENTATION ON CORE SYMPTOMS, SERUM SEROTONIN, AND INTERLEUKIN-6 IN CHILDREN WITH AUTISM SPECTRUM DISORDERS: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** Children with autism spectrum disorders (ASD) have lower serum vitamin D and higher serotonin and interleukin (IL)-6 levels compared with healthy children. The aim of this study was to evaluate the effect of vitamin D on core symptoms and serum levels of serotonin and IL-6 in these children.

**Methods:** This parallel randomized double-blind, placebo-controlled trial was conducted with 43 children with ASD (7 girls and 36 boys;  $8.91 \pm 2.87$  y of age). Children were randomly allocated to receive either vitamin D drop (300 IU/kg up to a maximum of 6000 IU daily) or placebo for 15 wk. Serum levels of 25-hydroxyvitamin (OH)D, IL-6, and serotonin were measured at baseline and at the end of the trial. Also, the severity of autism and the social and individual maturity of the children were measured by the Childhood Autism Rating Scale (CARS), the Autism Treatment Assessment Checklist (ATEC), and Aberrant Behavior Checklist-Community (ABC-C) questionnaires before and after intervention.

**Results:** More than 86% of patients had vitamin D deficiency at the beginning of the study. Serum levels of 25 (OH)D increased significantly in the vitamin D group ( $P = 0.001$ ). The clinical symptoms of autism measured by CARS and ATEC scales were alleviated significantly ( $P = 0.021$  and  $P = 0.020$ , respectively); however, the serum levels of serotonin and IL-6 and the scale of ABC-C remained without a significant change.

**Conclusion:** These findings suggest that vitamin D supplementation may improve ASD symptoms; however, more studies with longer duration are indispensable to confirm our results.

**Keywords:** Autistic disorders, 25(OH)D, Serotonin, Interleukin-6, Autism spectrum disorders



## GESTATIONAL DIABETES MELLITUS AND ITS RELATIONSHIP WITH BIRTH WEIGHT AND NEONATAL JAUNDICE

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**Background and Aim:** Gestational Diabetes Mellitus (GDM) is associated with an increased risk of fetal and neonatal complications, as well as long-term complications for children. This study aimed to investigate the prevalence of GDM and its relationship with birth weight and neonatal jaundice in mothers, referring to healthcare centers in Zahedan, Iran

**Methods:** This cross-sectional study was conducted on 630 women referring to Zahedan health care centers using systematic randomized sampling. Gestational Diabetes Mellitus, birth weight and neonatal jaundice were collected and recorded using pregnancy and children's care forms. The data was analyzed on SPSS.22 software using the Chi-square test

**Results:** The results of the present study showed that 12.7% of mothers had GDM, 9.4% and 3.8% of infants were underweight and macrosomic, respectively, and also 6.2% of infants had neonatal jaundice. There is a significant relationship between the infant's birth weight and gestational diabetes mellitus ( $P < 0.05$ ). There was also a significant relationship between maternal GDM and neonatal jaundice ( $P < 0.05$ )

**Conclusion:** : Identifying problems threatening the healthiness of the mother and newborn and more attention to nutritional health care during pregnancy are efficient strategies for preventing and controlling neonatal complications related to this period and mothers and newborns' healthiness. Specific attention to prevention programs and empowering health care policies during pregnancy, promotion of prenatal care and self-care can be the most important health priorities.

**Keywords:** Diabetes, Gestational, Jaundice, Birth Weight



## COMPARISON OF BODY MASS INDEX AND IRON DEFICIENCY ANEMIA IN MOTHERS WITH TERM AND PRETERM LABOR REFERRING TO HEALTH CARE CENTERS IN ZAHEDAN

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**Background and Aim:** Preterm labor is parturition that occurs before the 37th week of pregnancy. The prevalence of preterm labor is 9.6% in the world and between 5.1- 8.5% in Iran. Preterm labor is the most common cause of infant mortality. This study aimed to investigate the prevalence of GDM and its relationship with birth weight and neonatal jaundice in mothers referring to health care centers in Zahedan.

**Methods:** This case-control study was conducted on 398 pregnant women referring to health care centers in Zahedan. The anthropometric and biochemical information of mothers was collected through their electronic health record. The data was analyzed on SPSS.22 software using the Chi-square test.

**Results:** Iron deficiency anemia was observed in 6.6% and 6.8% of mothers with term and pre-term delivery, respectively. Overweight and obesity were reported in 21.5% and 13.8% of term mothers and 19.7% and 14.4% in pre-term mothers, respectively. The relationship between the variables of term and pre-term delivery with iron deficiency anemia and body mass index was not statistically significant ( $P>0.05$ ).

**Conclusion:** Due to the presence of iron deficiency anemia, overweight and obesity in the studied mothers and the negative impact of these factors on the health status of mothers and infants, it is necessary to pay more attention to nutrition and health care during this period

**Keywords:** Anemia, Preterm labor, Body mass index



## CHARACTERIZATION OF THE BINDING OF JUGLONE, AN ORGANIC COMPOUND TO BOVINE SERUM ALBUMIN

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**Background and Aim:** The use of plant-derived substances as natural compounds in the food industry, due to their benefits to human health, has been intensively studied in recent years. Juglone (5-hydroxy-1,4-naphthalenedione) is an organic colorants belonging to the class of naphthoquinones that known as C.I. Natural Brown 7 and C.I. 75500 in food industry.

**Methods:** In this study, interactions of juglone with bovine serum albumin (BSA) in aqueous solution were carried out using fluorescence and UV-Vis spectroscopies techniques at four different temperatures.

**Results:** The fluorescence quenching results showed that juglone reduces the intensity of BSA fluorescence by forming a complex with BSA through a static quenching. As the temperature increase, values of binding constant increased from  $2.48 \times 10^2$  to  $5.66 \times 10^2$  (M<sup>-1</sup>) demonstrating that the stability of juglone-BSA complex increased with temperature rising. Based on thermodynamic investigations (positive entropy and enthalpy values) revealed that the juglone molecule bind to BSA via hydrophobic bonds. Additionally, as shown by the UV-Vis absorption juglone could lead to conformational and changes of BSA with formation of ground state complex, which may affect the physiological functions of this serum albumin.

**Conclusion:** Interaction studies of food additives with proteins are done to understand how these substances affect the structure, function, and bioavailability of proteins in food and in the human body. Finally, it can be concluded that juglone has capability for interaction with BSA and may led in the conformation change of this protein.

**Keywords:** Food safety, Juglone-BSA Complex, Spectroscopic technique



## EFFECTS OF PROBIOTICS ON ORAL HEALTH IN CHILDREN AND ADOLESCENTS: A SYSTEMATIC REVIEW

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**Background and Aim:** The interest in using probiotics as a therapy to prevent oral diseases and improve oral health has significantly grown over the years. This study aims to determine the effects of probiotics on oral health in children and adolescents.

**Methods:** In this study, databases including Scopus, PubMed and Google Scholar, were systematically searched until October 2023. This study was conducted based on the Cochrane checklist. Nine controlled trials that examined the effects of probiotics on oral health in children and adolescents were included.

**Results:** All of the articles demonstrated that probiotic intervention resulted in a significant decrease in the levels of salivary streptococcus mutans (SM) and plaque index (PI) in children and adolescents. Children who also used fluoride mouthwashes experienced a reduction in plaque index, but the effects of probiotics were more effective and beneficial in the short term. These effects diminished over time but remained at a consistent level. There were no significant differences observed during the duration of the studies when non-probiotic agents, such as regular milk and mouthwashes, were used. Additionally, the levels of SM were similar among all groups. Probiotics had minimal side effects on children and adolescents. Probiotics were most effective in short-term interventions.

**Conclusion:** The findings of this study suggest that probiotic therapy significantly lowers the levels of SM and PI, reducing the risk of dental caries. Probiotics are a safe alternative with no observed side effects and can be beneficial for individuals, especially children and adolescents, in improving their oral health.

**Keywords:** "Probiotics"; "oral microbiome"; "oral health"; "dental plaque"; "children"



## PROBIOTICS AND MICROBIOME CHANGE THE ICU MEDICAL WORLD

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**Background and Aim:** In recent years, a compelling trend has emerged within the scientific advancements in the ICU (Intensive Care Unit) field, particularly in microbiome projects. In contrast to historical perspectives that regarded bacterial symbionts as pathogens, current comprehension emphasizes the critical significance that microbiomes have on the functioning of human physiology. This includes protection against infections, disease recovery, vitamin synthesis, nutrition, and drug metabolism. Astonishing new findings in critically ill patients indicate a severe disruption in microbiota homeostasis, termed “dysbiosis,” involving the loss of health-promoting microbes and the overgrowth of pathogenic bacteria. This dysbiosis phenomenon is particularly evident in ICU patients due to the high consumption of antibiotics, hospital interventions, drastic changes in dietary regimes, stress resulting from critical illness, and the patient’s genetic background, placing them at high risk of dysbiosis. This phenomenon contributes to the exacerbation of hospital-acquired infections, sepsis, multiple organ dysfunction syndrome (MODS), and subsequent adverse outcomes. Therefore, this investigation aims to comprehend new evidence for targeted interventions involving microbiomes in ICU dysbiosis.

**Methods:** ICU-associated dysbiosis in critical illness is characterized by the loss of health-promoting microbes and excessive growth of pathogenic bacteria. This is often the result of various factors, including widespread and excessive antibiotic use. Evidence indicates that antibiotics constitute up to 30% of the hospital’s drug budget, with 70% of ICU-admitted patients receiving antibiotic treatment. Additionally, 37% of hospital antibiotic prescriptions are unnecessary or inappropriate. Moreover, the adverse effects of dysbiosis include complex disruptions in host immunity and systemic inflammation. This raises the question of whether there is a need to reconsider our strategies for microbial treatment in the ICU. The astounding prevalence of dysbiosis and its detrimental consequences underscore the urgency of reassessing and revising our approach to microbial therapy in the ICU setting. Probiotics, living microorganisms of human origin, have demonstrated beneficial health effects in both in vivo and clinical studies when consumed in sufficient amounts. These interventions have shown preventive and therapeutic benefits for various





diseases. Several mechanisms have been identified for the beneficial effects of probiotic interventions, including the modulation of gut flora by inducing host antimicrobial peptides, release of antimicrobial factors, suppression of immune cell proliferation, stimulation of mucin and IgA production, antioxidant activity, inhibition of nuclear factor-kappa B activation in epithelial cells, prevention of intestinal apoptosis, and other recognized protective effects on the epithelial barrier. Given that changes in gut homeostasis and gut microbiota in critical illnesses are associated with increased production of inflammatory cytokines, disruption of gut barrier function, and enhanced cellular apoptosis, which can contribute to the progression of critical illnesses, sepsis, and MODS, it is crucial to note that the beneficial mechanisms of probiotics may be specific to certain species, subspecies, or strains. In recent years, the use of probiotics or synbiotics for restoring a healthy microbiome in the heterogeneous population of ICU patients has been the subject of numerous systematic reviews and meta-analyses focusing on a wide spectrum of outcomes following critical illness. The nutritional highlights the potential role of probiotics in mitigating infection risk, particularly ventilator-associated pneumonia (VAP), which is a significant concern for mechanically ventilated patients, and further research is needed to fully elucidate the effectiveness of probiotics in preventing VAP and to address any existing controversies in this regard. Recently, the largest and most up-to-date systematic review and meta-analysis to assess the overall effects of probiotics and synbiotics on critically ill patients was published by Wischmeyer and colleagues. This study compiled data from 30 randomized controlled trials involving 2,972 critically ill adult patients receiving probiotics alone or synbiotics. Finally, clear benefits were demonstrated in ICU-acquired infections, especially in new VAP cases and antibiotic therapy duration. Furthermore, a recent meta-analysis in JAMA, focusing on antibiotic-associated diarrhea, compiled data from 63 studies involving over 11,800 patients and demonstrated that probiotics reduce antibiotic-associated diarrhea by up to 40%.

**Conclusion:** Primary findings from ICU Microbiome research indicate a pronounced dysbiosis in critically ill patients. Based on increasingly promising evidence from meta-analyses and randomized controlled trials, novel targeted therapeutic approaches such as probiotics, prebiotics, fecal microbiota transplantation, and even “fecal pills” are recommended to improve outcomes in critical illness patients and restore microbial balance.

**Keywords:** Critical care; Probiotic; Microbiome; Dysbiosis; Antibiotics.



## Relationship between leukocyte telomere length and nutritional factors: a literature review

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**Background and Aim:** Telomeres are nucleoprotein complexes composed of guanine-rich TTAGGG repeating units, located at the ends of chromosomes in eukaryotic cells and essential for maintaining cellular integrity. Rapid telomere shortening may result from increased exposure to oxidative stress and inflammation. Available evidence suggests that short leukocyte telomere length (LTL) is associated with increased risk of various non-communicable diseases as well as aging. Studies have shown that LTL can be modified by lifestyle practices, including smoking and unhealthy eating habits. Therefore, the current study was conducted as a review on the role of nutritional factors on and telomere length

**Methods:** This paper systemically reviews the literature available on Google Scholar, PubMed, Embase, and Scopus databases on the effect of nutritional and dietary factors on LTL. In addition to the above databases, the search of the list of sources of selected studies, related conferences and theses was done manually.

**Results:** A total of 478 publications were found. fourteen articles were ultimately selected for inclusion in the study. Reviewed studies showed that a Mediterranean dietary pattern with higher consumption of vegetables, fruits and omega-3 fatty acids or fiber was associated with longer telomeres, while higher consumption of saturated fatty acids or higher consumption of processed meats was related with shortening LTL. There is also a positive correlation between total dietary antioxidant capacity, calorie restriction, and telomere length. Micronutrients such as vitamin D, zinc, B12, magnesium also had a significant relationship with the length of leukocytes. Also the relationship between food insecurity and LTL shortening in young adults showed that some of the future effects of food insecurity on the risk of chronic disease in this population can be mediate telomere shortening.

**Conclusion:** It seems that nutritional factors with an effective role in inflammatory and oxidative stress mechanisms can affect the length of telomeres. Further studies in the form of clinical trials can be useful in confirming these findings

**Keywords:** Telomere, leukocyte telomere length, LTL, Nutrition, Micronutrients, Diet



## SARCOPENIA AND MALNUTRITION IN POST-COVID PATIENTS: A SYSTEMATIC REVIEW

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**Background and Aim:** The spread of coronavirus disease 2019 (COVID-19), was declared a pandemic by the World Health Organization (WHO) on the 11th of March 2020. Which is still prevalent in the world and leaves extensive complications for the survivors. Malnutrition and sarcopenia can be a serious risk for these patients. The present study was a systematic review focused on the existing long-term effect of covid 19 on malnutrition and sarcopenia incidence

**Methods:** The literature was searched in online databases including PubMed, Scopus, EMBASE, ProQuest, and Google Scholar from 2019 to July 2022. Among the searched studies, eight articles were selected for final review.

**Results:** According to recent studies, a significant percentage of patients (30-50%) were found to be malnourished when they left the hospital after being treated for COVID-19. After a follow-up period of 3-6 months, the rate of malnourishment in these patients was still high (3-50%). It was also noted that patients who suffered from malnourishment were more likely to experience cognitive and psychiatric disorders than other survivors of COVID-19. Furthermore, the studies reported a high rate of sarcopenia, ranging from 19.5% to 86.9%, which was more common in elderly patients.

**Conclusion:** The high probability of being at risk of malnutrition and sarcopenia among COVID-19 survivors has been one of the most common complications, especially in older patients. These patients need intensive care and nutritional support to avoid long-term disability.

**Keywords:** COVID-19, sarcopenia, Malnutrition



## EFFECTS OF CHIA (*SALVIA HISPANICA*. L) ON LIPID PROFILE IN PATIENTS WITH METABOLIC DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Chia seed is widely used as a functional food for its rich sources of linolenic acid, dietary fibers, and several biologically active components in the world. This systematic review and meta-analysis on randomized controlled trials (RCTs) was conducted to evaluate the effects of chia seed and its derivatives on lipid profile in patients with metabolic diseases like dyslipidemia, hypertension, and type 2 diabetes.

**Methods:** Literature search was performed in PubMed, Scopus, and Web of Science through 2 Jun 2023, to identify studies reporting the effects of chia on lipid profile. Study outcomes included triglyceride (TG), total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and high-density lipoprotein cholesterol (HDL-C). Weighted mean differences with 95% confidence interval (CI) were pooled using random-effects models.

**Results:** Four studies were included in the meta-analysis. The supplementation of chia resulted in a statistically significant decrease in triglyceride (-41.78 mg/dl 95% CI; -71.61 to -11.95; I<sup>2</sup>=71.4%, P heterogeneity=0.015), total cholesterol (-16.60 mg/dl; 95% CI -21.38 to -11.82; I<sup>2</sup>=0%, P heterogeneity=0.732) and LDL-C (-13.02 mg/dl; 95% CI -17.12 to -8.92; I<sup>2</sup>=0%, P heterogeneity=0.712), but not HDL-C (-0.32 mg/dl; 95% CI -3.76 to 3.12; I<sup>2</sup>=41.3%, P heterogeneity=0.164).

**Conclusion:** It seems that chia seed supplementation might be effective in improving lipid profile. However, included studies according to the Cochrane quality assessment tool were at high risk of bias. Therefore, further clinical trials are needed with high quality to confirm our findings.

**Keywords:** chia seed; lipid profile; metabolic disease.



## ASSOCIATION OF DIETARY MAGNESIUM WITH GENERAL AND ABDOMINAL OBESITY IN ELDERLY POPULATION: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Limited epidemiologic data are available linking dietary intake of magnesium (Mg) and obesity in the elderly. Therefore, we aimed to investigate the association of dietary Mg intake with general and abdominal obesity in elderly individuals.

**Methods:** This cross-sectional study was conducted among 345 elderly people (with an age range of 60-85 years) in Jolfa, Iran. Dietary information was collected using a validated semi-quantitative food frequency questionnaire. Data regarding height, weight, and waist circumference were collected using standard methods.

**Results:** The mean age of study participants was  $69.27 \pm 7.29$ . Overall, 30.6% of subjects were generally obese and 58.5% were abdominally obese. There was a significant inverse association between the dietary Mg intake and odds of general obesity, either before (ORs for comparing T3 vs. T1: 0.51; 95% CI: 0.29, 0.91; P-trend = 0.02) or after controlling for potential confounders (ORs for T3 vs. T1: 0.37; 95% CI: 0.15, 0.86; P-trend = 0.01). Moreover, a higher Mg intake was associated with lower odds of abdominal obesity, either before (ORs for comparing T3 vs. T1: 0.54; 95% CI: 0.31, 0.93; P-trend = 0.02) or after considering potential confounders (ORs for T3 vs. T1: 0.40; 95% CI: 0.19, 0.85; P-trend = 0.01).

**Conclusion:** The findings of the current study provide evidence for a protective role of dietary Mg intake against general and abdominal obesity in elderly people. More studies are needed to confirm our findings.

**Keywords:** magnesium, obesity, elderly



## ASSOCIATION OF DIETARY FIBER WITH GENERAL AND ABDOMINAL OBESITY IN ELDERLY POPULATION: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Obesity and dietary habits have a different and unique picture in Middle Eastern people. Investigating the diet-obesity relations in this part of the world is of great importance. Therefore, the aim of this study was to assess the association of dietary fiber intake with obesity in elderly Iranians.

**Methods:** This cross-sectional study was performed on 345 participants aged 60 years or older. A reliable and valid 80-item semi-quantitative food frequency questionnaire (FFQ) was used to assess the usual dietary intakes of participants. Multivariable binary logistic regression analyses were performed to evaluate the association between dietary fiber intake and odds of general as well as abdominal obesity.

**Results:** The mean age of the study participants was  $69.27 \pm 7.29$  years, and 63% of them were female. General obesity prevalence was 30.6%, while abdominal obesity was 58.5%. There was no significant association between dietary fiber intake and general (ORs for comparing T3 vs. T1: 0.80; 95% CI: 0.44, 1.43; P-trend = 0.46) or abdominal (ORs for comparing T3 vs. T1: 0.65; 95% CI: 0.38, 1.13; P-trend = 0.13) obesity in the crude model. After controlling for several potential confounders, the results remained insignificant for general (ORs for comparing T3 vs. T1: 0.60; 95% CI: 0.29, 1.23; P-trend = 0.19) and abdominal (ORs for comparing T3 vs. T1: 0.57; 95% CI: 0.30, 1.07; P-trend = 0.08) obesity.

**Conclusion:** No significant association was observed between dietary fiber intake and odds of general and central obesity.

**Keywords:** fiber; obesity; elderly



## EFFECT OF CUMINUM CYMINUM ON GLYCEMIC PARAMETERS: A SYSTEMATIC REVIEW

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**Background and Aim:** Cuminum Cyminum (CC) is a traditional herbal medicine used as an antiseptic, anti-carcinogenic, anti-mutagenic, anti-cancer, anti-hypertensive, anti-inflammatory, and antioxidant. Recently, the hypoglycemic characteristics of CC have been indicated. We intended to conduct a meta-analysis on the effect of CC supplementation on glycemic parameters in patients with different chronic diseases. This systematic review aims to study the effect of Cuminum Cyminum on glycemic parameters.

**Methods:** PubMed, Embase, Web of Science, and Scopus were searched until December 2023. A random effect model was conducted to perform the meta-analysis. The source of heterogeneity was explored using the meta-regression and subgroup analyses. The Cochrane Collaboration's tool was used to assess the quality of studies. The GRADE approach was used to determine the quality of evidence. Two researchers independently checked titles and abstracts, evaluated full-text studies, extracted data, and appraised their quality using the Cochrane Collaboration's tool.

**Results:** All clinical trials that assessed Cuminum Cyminum effect on glycemic parameters included. Finally, only seven out of 224 articles met the required criteria for further analysis. The findings of seven studies showed that CC supplementation reduced FBS and HbA1c significantly. Also, no significant effect of CC was observed on insulin and HOMA-IR.

**Conclusion:** Cuminum Cyminum had an improving effect on FBS and HbA1C. The impact of CC on amending HOMA-IR was significant after sensitivity analysis. However, the insulin level was not changed significantly.

**Keywords:** Cuminum Cyminum; glycemic parameters; systematic review



## EFFECT OF CITRULLUS COLOCYNTHIS ON GLYCEMIC FACTORS IN DIABETIC PATIENTS: A SYSTEMATIC REVIEW

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**Background and Aim:** Diabetes mellitus (DM) is a chronic disease caused by a lack of insulin or insulin dysfunction resulting in hyperglycemia. Citrullus colocynthis is a plant used by traditional medicine practitioners to treat diabetes in Iran. The fruit of this plant has different medical uses in traditional Persian medicine, i.e., anti-inflammatory, purgative, antidiabetic, analgesic, hair growth-promoting, and antiepileptic. In this systematic review, we investigated the effect of Citrullus colocynthis on glycemic factors.

**Methods:** In this systematic review, we conducted a literature search in PubMed, Scopus, Web of Sciences, and Google Scholar databases from inception until December 2023. Two researchers independently checked titles and abstracts, evaluated full-text studies, extracted data, and appraised their quality using the Newcastle-Ottawa Scale (NOS). The search consisted of the (“FBS” OR “Glucose” OR “HOMA-IR” OR “haemoglobin A1C”) and (“Citrullus colocynthis.” or “Colocynth”). We followed the recommended PRISMA guidelines in executing this study.

**Results:** Of the 130 articles searched in the databases, 11 related articles were included. six of them indicate that Citrullus colocynthis does not significantly affect fasting blood sugar (FBS) and hemoglobin A1c (HBA1c), four of them showed a significant decrease in FBS and no significant change in HBA1c and HOMA-IR.

**Conclusion:** In conclusion, our findings indicate that Citrullus colocynthis probably cannot have a potential therapeutic effect in treating diabetes. However, we recommend conducting adequately powered, high-quality RCTs with short- and long-term follow-up, evaluating relevant clinical outcomes to allow for making definitive recommendations.

**Keywords:** Citrullus colocynthis; Systematic review; diabetes





## THE EFFECT OF SYZYGIES CUMINI (S. CUMINI) ON OXIDATIVE STRESS IN DIABETIC PATIENTS: A SYSTEMATIC REVIEW

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**Background and Aim:** Global prevalence of type 2 diabetes (T2D) is very high and is currently growing alarmingly. The oxidative stress in diabetes was significantly increased due to prolonged exposure to hyperglycemia and oxidant/antioxidant equilibrium impairment. *Syzygies cumini* (*S. cumini*) (L.) Skeels (jambolan) are widely used medicinal plants in treating various diseases because they contain several bioactive compounds with antioxidant, antiproliferative, antimicrobial, and anti-inflammatory properties. Thus, we evaluate the effect of *S. cumini* on oxidative stress in diabetic patients.

**Methods:** Relevant articles published up to December 2023 were searched through PubMed/Medline, SCOPUS, Cochrane Library, and Google Scholar databases using relevant keywords. We estimated the change in the biomarker of oxidative stress by using the *Syzygies cumini* in each trial and then calculated the weighted mean difference (WMD) and 95%CI using a random-effects model. The risk of bias for the study was assessed using the Cochrane tool.

**Results:** Overall, 11 randomized controlled trials of 230 were included in this study. In 4 of them, *Syzygies cumini* significantly reduced (C-reactive protein) CRP and Tumor necrosis factor alpha (TNF- $\alpha$ ). In five studies, no significant reduction was found in CRP and Malondialdehyde (MDA), and two studies showed a significant decrease in MDA and Superoxide dismutase (SOD) comparing *Syzygies cumini* supplementation to the placebo group.

**Conclusion:** *Syzygies cumini* supplementation had beneficial effects on CRP, TNF- $\alpha$ , MDA, SOD, GPx, and TAC. Thus, *Syzygies cumini* can be recommended as an adjuvant anti-oxidant agent and anti-inflammatory.

**Keywords:** *Syzygies cumini*, Oxidative stress, systematic review



## THE IMPACT OF DIETARY LEAD INTAKE ON INFERTILITY: A SYSTEMATIC REVIEW

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**Background and Aim:** This review aims to investigate the relationship between dietary lead intake and infertility, considering the rising rates of reproductive issues and the influence of environmental factors.

**Methods:** A systematic review was conducted, searching databases including PubMed, ISI, Scopus, and Google Scholar using predefined keywords from the Cochrane protocol.

**Results:** Fourteen studies conducted between 2013 and 2023 have found evidence suggesting that even at lower levels, exposure to lead can have negative effects on female reproduction. These effects include disruptions in menstrual cycles, impairments in the development of offspring, reduced intellectual ability in young ones, decreased weight in offspring, and impacts on semen quality and hormonal production and release in males. There are sources that suggest lead can disrupt the endocrine system and cause oxidative stress. These sources indicate that lead can impair fertility and hormonal balance in both males and females, reduce sexual desire, interfere with sperm production, disrupt the menstrual cycle in women, affect the ability to conceive and result in negative pregnancy outcomes, among other effects.

**Conclusion:** This review suggests that even lower levels of lead in the blood can disrupt reproduction hormone levels. Additionally, recent reports have shown that low levels of lead have detrimental effects on reproductive health, contradicting previous beliefs that certain blood lead levels were safe. However, humans are not only exposed to lead but also encounter various other harmful substances in their daily lives. Therefore, it is challenging to identify one specific substance or factor that is solely responsible for the negative impacts on reproduction.

**Keywords:** dietary lead, heavy metals, infertility, reproductive health, environmental factors



## THE EFFECT OF VITAMINS ON MALE FERTILITY: A SYSTEMATIC REVIEW

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**Background and Aim:** Infertility is defined as the inability to conceive after 12 months of unprotected sex. It is estimated that there are at least 30 million infertile men in the world. Many factors affect male fertility, including diet and vitamins. The present study was conducted with the aim of determining the role of vitamins in male fertility.

**Methods:** The articles were extracted from Persian SID database, English Pubmed database and Google scholar search engine. To access all Persian and English articles, male infertility, male fertility, vitamin D, vitamin A, vitamin E, vitamin B, vitamin C, their Persian equivalent and a combination of these keywords in the databases mentioned in the period 2000-2023 were used and finally 21 articles were reviewed.

**Results:** Oxidative stress can cause infertility and sperm defects. Antioxidants like Vitamin E can prevent fat oxidation chain reactions. Recent research indicates that vitamin D receptors in the prostate and testicles are crucial for sperm development. Vitamin C, accounting for 65% of semen's antioxidant capacity, is used to enhance sperm quality. Studies show that daily supplements of Q10, zinc, vitamin C and E, acid folic once a day, and selenium every other day improve sperm parameters in infertile smokers.

**Conclusion:** Since micronutrients deficiency shows their effect in the long term and infertility treatments are expensive, it is suggested nutrition-related infertility can be prevented by teaching couples how to get enough of them. To determine more precisely the role of vitamins in fertility, it is recommended to increase clinical research in this field.

**Keywords:** "male infertility", "male fertility", "vitamin D", "vitamin E", "vitamin C"



## INVESTIGATING OBESITY AND OVERWEIGHT RISK FACTORS IN WOMEN AGED 20 TO 50 IN QAZVIN PROVINCE: A CASE-CONTROL STUDY

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**Background and Aim:** Obesity and overweight

**Methods:** The current research was a control case and the statistical population was 422 women in the age range of 20 to 50 years living in Buin Zahra city in Qazvin province, who were selected by stratified cluster sampling method. The information on the food consumption of people during the last year using a questionnaire on food frequency and amount Physical activity was obtained using a physical activity questionnaire. Mann-Whitney, Fisher and logistic regression tests were used to analyze the data.

**Results:** According to the logistic regression model, consumption of more bread and cereals, vegetables, sugars and less consumption of dairy products and not having enough physical activity were associated with the risk of obesity and overweight. Also, women who had groups of bread and cereals, sugars, salt and miscellaneous (tea, soft drinks, coffee, ice cream, dried string sweets, chips and puffs, pickles and salt, all kinds of halva, biscuits and industrial fruit juices) were consumed more, they were more exposed to overweight and obesity. Consumption of sugars and legumes was also higher in people with higher waist-hip ratio ( $P < 0.05$ ). Lower education and employment levels were also known as other risk factors for obesity and overweight

**Conclusion:** The findings of the study show that unfavorable nutritional behaviors, reduced physical activity, low level of education and employment are among the risk factors of obesity and overweight, which shows the need for awareness in order to improve nutritional behaviors, physical activity and lifestyle of the studied.

**Keywords:** frequency of food consumption, obesity and overweight, physical activity.



## ASSOCIATION BETWEEN TYPE 2 DIABETES AND DIFFERENT TYPES OF DIETARY FATS: A CASE-CONTROL STUDY

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**Background and Aim:** The impact of dietary fat on type 2 diabetes (T2D) is unknown. This study aimed to determine the relationship between T2D and dietary fatty acids in Iranian adults.

**Methods:** This case-control study was conducted on 4241 participants aged 35-70 years, including 1804 patients with T2D and prediabetes as cases and 2437 patients without diabetes as controls. Dietary intake was assessed using a food frequency questionnaire (FFQ).

**Results:** Cases were older ( $48.36 \pm 8.62$  vs.  $54.53 \pm 7.75$  years,  $P < 0.001$ ), weight ( $73.77 \pm 13.41$  vs.  $76.18 \pm 13.49$  kg,  $P = 0.001$ ), body mass index (BMI) ( $28.02 \pm 4.70$  vs.  $24 \pm$  kg), fasting Blood sugar (FBS) ( $96.87 \pm 19.39$  vs.  $169.95 \pm 69.28$  mg/dl,  $P = 0.001$ ), triglyceride (TG) ( $141.61 \pm 99.37$  vs.  $175.96 \pm 114.74$  mg/dl,  $P = 0.001$ ), low-density lipoprotein cholesterol (LDL) ( $111.68 \pm 33.02$  vs.  $101.97 \pm 36.54$  mg/dl,  $P = 0.001$ ), and cholesterol ( $192.45 \pm 39.1190$  vs.  $187.12 \pm 46.19$  mg/dl  $P = 0.001$ ) compared with controls. T2D was negatively associated with PUFA intake (OR = 0.93, CI95%: 0.84-1.03,  $P = 0.01$ ) and positively associated with dietary cholesterol (OR: 1.01, CI95%: 1.001-1.01,  $P = 0.02$ ).

**Conclusion:** In conclusion, cholesterol and polyunsaturated fatty acids are beneficial to diabetes. If current findings on the effects of fat on diabetes are confirmed, it may be possible to improve dietary guidelines for those at risk of diabetes by providing foods high in fat, polyunsaturated fatty acids and low in cholesterol.

**Keywords:** Diabetes, Diet, Dietary fats, Polyunsaturated fatty acids



## THE IMPACT OF DIETARY VITAMIN E INTAKE ON NAFLD: A CROSS-SECTIONAL STUDY FROM NHANES

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**Background and Aim:** Considering the lack of consistent findings concerning the relationship between Vitamin E intake and NAFLD, further investigations into the association between Vitamin E and NAFLD are warranted. Therefore, our aim was to assess the association between dietary Vitamin E intake and NAFLD using a reputable dataset

**Methods:** We utilized data collected from the 2017–2020 National Health and Nutrition Examination Survey (NHANES) to extract information on NAFLD and dietary Vitamin E intake. Linear regression and Pearson correlation were performed to evaluate the relation of Vitamin E intake with other Median stiffness (E), kilopascals (kPa) and Median CAP, decibels per meter (dB/m).

**Results:** Our study included a total of 7,334 subjects (3,565 men and 3,769 women) aged 20–59 years. A significant inverse association was found between kPa score ( $R = -0.28$ ,  $p = 0.012$ ) and CAP score ( $R = -0.191$ ,  $p = 0.027$ ) with vitamin E intake ( $R = -0.171$ ,  $p = 0.027$ ). In addition, there were a significant relation of vitamin E intake with kPa and CAP scores in . Linear regression (Beta =  $-0.246$ ,  $p = 0.002$  and Beta =  $-0.219$ ,  $p = 0.006$ , respectively).

**Conclusion:** In conclusion, our findings suggest that dietary Vitamin E intake has a invers association with NAFLD in the American population. Further research is warranted to explore this relationship in patients with different status of diseases.

**Keywords:** Vitamin E ; NAFLD; inflammation



## THE ASSOCIATION BETWEEN DIETARY INTAKE OF VITAMINS B GROUP AND D WITH SLEEP QUALITY IN METABOLIC SYNDROME PATIENTS.

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**Background and Aim:** Recently, poor sleep quality has been associated with a greater incidence and progression of adverse health conditions such as metabolic syndrome (MetS), a collection of metabolic disorders. However, the findings from epidemiologic studies regarding the impact of sleep on MetS are inconsistent. Also sleep quality can be influenced by nutrients and vitamins intake. This study aimed to assess the quality of sleep in MetS and investigate the relationship between dietary intake of B-group and D vitamins with sleep quality in these individuals.

**Methods:** A cross-sectional study was performed on 442 MetS patients 30-60 years of age, based on the record data in the Employees' Health Cohort Study, Shiraz, Iran. Also, a 124-item Food Frequency Questionnaire (FFQ), and a Pittsburgh Sleep Quality Index (PSQI) were used to assess the dietary intake of vitamins and the sleep quality of patients, respectively. A PSQI score of < 5 was considered to be good sleep quality.

**Results:** Our findings revealed that 69% of patients had poor sleep quality. Linear regression analysis showed that gender was effective on sleep quality which women had lower sleep quality ( $p < 0.001$ ). We found a significant relationship between thiamine intake and the PSQI score ( $\beta = -0.11$ ,  $p = 0.008$ ), while no significant association was observed with other vitamins."

**Conclusion:** These findings suggest that poor sleep quality may contribute to the risk of developing MetS, a condition more prevalent among women. Additionally, certain vitamins, including thiamine, may have a positive effect on sleep disorders in patients with MetS.

**Keywords:** metabolic syndrome; sleep quality; PSQI score; vitamin B; vitamin D



## INVESTIGATING THE EFFECT OF BRANCHED CHAIN AMINO ACIDS (BCAA) SUPPLEMENTATION ON IMPROVING SARCOPENIA IN PATIENTS WITH LIVER CIRRHOSIS (LC)

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**Background and Aim:** Sarcopenia is one of the main elements of malnutrition in liver cirrhosis (LC) and is present in 30-70% of this population. BCAA (leucine, isoleucine, valine) are essential amino acids that are essential for maintaining muscle mass. This study aims to investigate the effects of BCAA supplementation on several parameters used to evaluate sarcopenia in LC.

**Methods:** This systematic review was conducted in 2023 with an advanced search in valid databases including Pubmed, ClinicalTrials.gov, Scopus and Google Scholar using the keywords branched chain amino acids (BCAA), sarcopenia, liver cirrhosis and Mesh. Their terms were fulfilled. Articles with no time limit, all in English and randomized controlled trials (RCTs).

**Results:** A total of 10 studies were included in our review. In this study, we evaluated the effects of BCAA alone, along with exercise and vitamin D supplementation. The results in most studies showed that subjects receiving BCAA supplementation had significant improvement in the middle arm muscle circumference (MAMC), hand grip strength (HGS), however, the results were contradictory regarding the muscle skeletal index (MSI).

**Conclusion:** Our study showed that in addition to diet, exercise and lifestyle modification as the main factors for controlling sarcopenia, BCAA can improve sarcopenia in liver cirrhosis patients by improving muscle condition. However, we need more studies.

**Keywords:** branched chain amino acids (BCAA), sarcopenia, liver cirrhosis





## EFFECT OF VITAMIN C ON PROLIFERATION OF ACUTE MYELOID LEUKEMIA CELLS: A SYSTEMATIC REVIEW

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**Background and Aim:** Acute myeloid leukemia (AML) is a heterogeneous disorder characterized by excessive proliferation of undifferentiated myeloid progenitor cells in the bone marrow and blood. DNA sequencing technologies have shown that proteins involved in epigenetic processes together with genetic mutations may be involved in the development of the disease. Vitamin C is known as an antioxidant nutrient that protects the human body from oxidative stress. This substance may enhance the effects of hypomethylating agents by selectively killing tumor cells and DNA demethylation. In fact, this vitamin is a vital factor for epigenetic regulation. However, the idea that vitamin C could be used to treat cancer patients has been a hotly debated issue in a few areas of research. The purpose of this review was to investigate whether the consumption of vitamin C in patients with AML affects the proliferation of AML cells.

**Methods:** The search was performed to evaluate the effect of vitamin C on the proliferation of AML cells using PubMed and Web of Science.

**Results:** Finally, 5 studies were included in this review. The results of the studies showed that there is a significant relationship between low levels of vitamin C concentration and AML disease. Also, studies showed that the excessive proliferation of HL-60 and U937 cells was prevented by taking a high dose of vitamin C.

**Conclusion:** In conclusion, High-dose vitamin C can inhibit AML cell proliferation, promote apoptosis, and selectively kill primary leukemia cells in AML.

**Keywords:** "Vitamin C", "Acute myeloid leukemia", "Ascorbic acid", "Apoptosis"



## INVESTIGATING THE QUALITY OF LIFE IN PATIENTS WITH GASTROINTESTINAL CANCER- A SYSTEMATIC REVIEW

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**Background and Aim:** Gastrointestinal cancers pose significant challenges to patients' well-being and overall quality of life (QOL). Understanding the factors that influence QOL in this population is crucial for optimizing supportive care interventions. This systematic review aims to assess the impact of gastrointestinal cancer on the QOL of affected patients.

**Methods:** A systematic search of electronic databases was conducted to identify relevant articles published between 2010 and 2023. Inclusion criteria involved studies assessing QOL outcomes in patients diagnosed with gastrointestinal cancer, while excluding those focusing on specific interventions such as surgery or chemotherapy.

**Results:** Preliminary findings from the studies demonstrate that gastrointestinal cancer significantly impacts patients' QOL.

**Conclusion:** Physical symptoms related to the disease including pain, fatigue, nausea, vomiting and changes in appetite and body weight, have a profound effect on daily functioning and overall well-being. Psychological distress such as anxiety, depression, and fear is prevalent among patients and further contributes to the decline in QOL. Patient characteristics such as age, gender, tumor stage, treatment modalities and social support play a role in determining QOL in gastrointestinal cancer patients.

**Keywords:** "Gastrointestinal cancer", "the quality of life", "QOL"



## THE ASSOCIATION OF NEUROPEPTIDE Y LEU7PRO POLYMORPHISM WITH DIETARY INTAKE AND THE RISK OF OBESITY

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**Background and Aim:** The central nervous system has a critical role in the regulation of feeding behavior and overall energy homeostasis. Neuropeptide Y (NPY) as a hypothalamic orexigenic, participates in the regulation of food intake. Although NPY inherited variation affecting the susceptibility of obesity, contradictory evidences have been found in the association of Leu7Pro polymorphism (rs16139) with dietary intake and likelihood of being obese in human. The aim of this cross-sectional study is to investigate the potential association between the NPY Leu7Pro and both dietary intake and the risk of general and abdominal obesity.

**Methods:** A total of 398 subjects were selected from the Iranian Multicenter Osteoporosis Study (IMOS). Genotyping for the Leu7Pro polymorphism was performed by PCR-RFLP method. Anthropometric characteristics were measured. Dietary intake and physical activity were recorded by validated questionnaires. Adjusted multiple linear regression models were used to examine the association between the Leu7Pro polymorphism and dietary intake. The associations between the Leu7Pro polymorphism and the risk of both general and abdominal obesity were examined using adjusted multiple logistic regression models.

**Results:** NPY Leu7Pro was associated with high carbohydrate intake especially in subjects with BMI $\geq$ 25 (P<0.05). No significant association was found between this polymorphism and dietary intakes for energy, protein and fat.

**Conclusion:** The Leu7Pro polymorphism has a preference effect on carbohydrate intake. In addition, this effect is more intensive in overweight and obese participants.

**Keywords:** Neuropeptide Y, Polymorphism, Dietary intake, Macronutrient, Obesity



## PHYSICIAN PERSPECTIVES ON CALCIUM INTAKE INTERVENTIONS: A NATIONAL STUDY AMONG IRANIAN PHYSICIANS FOCUSING ON OSTEOPOROSIS MANAGEMENT

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**Background and Aim:** This article systematically investigates the approaches of Iranian General Practitioners in managing osteoporosis through calcium intervention, including supplement prescriptions and dietary advice. It aims to identify common practices, understand influencing factors, and highlight knowledge gaps. The ultimate objective is to enhance prescription practices, educational initiatives, and interdisciplinary cooperation for osteoporosis management in Iran

**Methods:** Involving 385 GPs, the study employs the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) within a comprehensive methodology. It utilizes cluster sampling and a specially designed questionnaire to delve into the nuances of calcium intervention practices. This approach enables an in-depth investigation and yields detailed insights into the determinants of GPs' approaches to calcium management

**Results:** The analysis presents varied practices, with 62% of GPs prescribing calcium supplements primarily to patients with certain risk factors, while 38% recommend them routinely. Key influencing factors include patient age and medical history, guiding 79% of prescription choices. Notably, 42% of GPs express uncertainty in their knowledge, with 56% actively pursuing current research updates. About 37% limit prescriptions to patients with osteoporosis or fractures. Only 27% offer comprehensive dietary advice, and collaboration with dietitians is noted in 15% of cases. The preference for calcium carbonate (83%) is influenced by cost considerations. Interestingly, 84% do not consistently monitor serum calcium levels in long-term supplement users

**Conclusion:** The study highlights the intricate nature of calcium management in osteoporosis, advocating for bespoke interventions, continuous education, improved interdisciplinary cooperation, and standardized monitoring protocols to elevate healthcare practices in this field

**Keywords:** Calcium supplementation; Dietary Calcium Intake ; Osteoporosis Management ; Medical prescribing behaviors ; Primary Care-Bone health



## ACHIEVEMENTS AND CHALLENGES IN THE WORLD'S FOOD AND NUTRITION SYSTEM: A REVIEW ARTICLE

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**Background and Aim:** The food and nutrition system impacts societies worldwide, but faces new challenges. This article outlines achievements, challenges, and potential solutions.

**Methods:** In this narrative review study, based on the search strategy, foreign databases PubMed, ScienceDirect and Google Scholar search engine were searched with keywords such as nutrition, achievement and challenge, in the time range of 2010 to 2023 and after screening and more detailed study of the articles, in the final stage, analysis was performed on 21 selected articles. After completing the data extraction form, the achievements and challenges of the food and nutrition system were extracted and qualitatively analyzed.

**Results:** Important achievements in food and nutrition include raising public awareness, promoting organic and healthy food, improving hygiene standards, and developing new technologies. Additionally, efforts to enhance nutrition and health at societal levels and the establishment of national and international policies are notable. However, challenges persist, including feeding a growing population, combating obesity and diet-related diseases, shifting dietary patterns towards processed foods, and addressing the environmental impacts of nutrition. To address these challenges, recommended solutions include employing smart technologies in agriculture, boosting protein production, expanding education and access to nutritional resources, and developing future-oriented food products.

**Conclusion:** To improve the food and nutrition system, we need cooperation and attention to new technologies, research, and policies. This will ensure a better and healthier future for all.

**Keywords:** Nutrition, Dietary Pattern, Healthy Nutrition, Achievement, Challenge



## THE EFFECT OF EIGHT WEEKS OF HIIT EXERCISES AND CALCIUM SUPPLEMENTATION ON MEMORY, SELECTIVE ATTENTION, DECISION-MAKING AND COGNITIVE FLEXIBILITY IN MALE ATHLETES OF THE NATIONAL ROWING TEAM

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**Background and Aim:** The aim of this study was to investigate the effect of eight weeks of HIIT exercises and calcium supplementation on memory, selective attention, decision-making and cognitive flexibility in male athletes of Iran's national rowing team.

**Methods:** Forty-four members of the national rowing team were selected. They randomly, were assigned to four exercises, calcium supplement intake, exercise + calcium supplement intake, and control groups. Standard Questionnaire were used

**Results:** A significant difference was observed after the intervention in memory, selective attention and cognitive flexibility ( $P < 0.05$ ). Regarding the decision-making variable had no significant changes ( $P < 0.15$ ). It showed that there is a negative correlation between decision-making and memory also, selective attention. A negative correlation was also observed between flexibility and memory, and also, with selective attention. There was an inverse correlation between age and cognitive flexibility, education and cognitive flexibility, marital status and cognitive flexibility. Examining the correlation between marital status and memory, decision-making and cognitive flexibility also showed a negative correlation. Regarding sleep status, also found a negative correlation between sleep duration and selective attention and age and marital status.

**Conclusion:** It seems that the implementation of high-intensity interval training for eight weeks alone and with calcium supplementation and the consumption of calcium supplement alone on the men of the national rowing team has effected the variables of memory, selective attention and cognitive flexibility and does not show any significant effect and improving on decision-making ability. It is suggested that more research be done at different sports levels.

**Keywords:** memory, attention, decision making, cognitive flexibility, national rowing team, calcium supplement



## THE EFFECT OF EIGHT WEEKS OF HIGH-INTENSITY INTERVAL TRAINING AND VITAMIN C CONSUMPTION WITH A MASK ON HIGH-SENSITIVITY C-REACTIVE PROTEIN AND INTERLEUKIN-6 IN MEN OF THE NATIONAL ROWING TEAM

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**Background and Aim:** Today, reaching the maximum of sports power is the main goal of athletes. This research has investigated the effect of eight weeks of high intensity interval training and vitamin C consumption with a mask on high-sensitivity C-reactive protein and interleukin-6 in men of the national rowing team

**Methods:** The research plan includes three groups of subjects with pre-test-post-test and a control group. The statistical population included athletes in the preparatory camp of the national rowing team. The participants include 48 qualified men in the age group of 22 to 27 years

**Results:** The findings show that after 8 weeks, there is a significant decrease in hs-CRP in the intermittent intensive + mask + vitamin C groups (Ma + VC group) and intermittent intensive + vitamin C (VC group), but the decrease in the intermittent intensive + vitamin C groups Mask (Ma group) and periodic high intensity (Co control) are not significant ( $P < 0.05$ )

**Conclusion:** It seems; Perhaps a longer period of time than exercises is needed to achieve effectiveness, and the use of supplements accelerates its improvement, which is related to the anti-inflammatory role of vitamin C and inhibits the activity of the transcription factor NF- $\kappa$ B and the expression of pro-inflammatory factors such as CRP and IL-6 decreases

**Keywords:** HIIT training, national rowing team



## THE EFFECT OF ALMOND ON BODY COMPOSITION AND LIPID PROFILE IN ADULTS: A LITERATURE REVIEW

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**Background and Aim:** Almonds are a food high in polyphenolic chemicals and are abundant in vital polyunsaturated and monounsaturated fatty acids as well as bioactive elements such as arginine, calcium, magnesium, proteins, fibers, antioxidants, phyto-sterols, and phytolipids. This nut has anti-inflammatory and anti-oxidant properties which are related to its polyphenols. Consuming almonds has been found to decrease blood lipid profiles, especially in those who suffer from symptoms associated with diet, such as obesity, diabetes, and hyperlipidemia. Regular consumption of almonds may also aid in altering body composition, according to a study on weight loss programs. Almond's contents play an important role in improving body composition and lipid profile's signaling processes. This review paper aimed to assess the effect of almond on body composition and lipid profile in adults.

**Methods:** A systematic search was conducted using Scopus, PubMed, and Google Scholar to identify relevant citations from 2010-2023 on almond, body composition, and lipid profile, collecting research titles, abstracts, and analyzing their entire texts of publications that met inclusion requirements.

**Results:** Changes in body fat percentages, fat free mass, and body mass index were significantly impacted by the intervention. Five studies showed a decrease in total body fat, two in skeletal muscle mass and total body protein, and four in waist circumference. Eating almonds as a daily snack decreased the lipid profile levels.

**Conclusion:** Studies suggest that eating almonds helps reduce body composition in those with hypercholesterolemia by lowering cholesterol, although well-designed dose dependent studies are recommended in future research.

**Keywords:** Almond, Body Composition, lipid profile





## ASSOCIATION BETWEEN HEDONIC HUNGER AND BODY MASS INDEX IN CHILDREN AND ADOLESCENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Hedonic hunger, which refers to reward-driven eating beyond physiological needs with a focus on palatable foods, has been proposed as one of the important causes of obesity in recent years. The present systematic review and meta-analysis summarize the existing evidence for the association between hedonic hunger and body mass index (BMI) in healthy children and adolescents.

**Methods:** Three PubMed, Web of Science, and Scopus databases were searched using keywords until January 2023. All English-language original observational studies in which the Power of Food Scale (PFS) was used to evaluate hedonic hunger in healthy subjects, were included. Quality assessment was done using the Joanna Briggs Institute checklist, and StataMP-17 software was used for the meta-analysis.

**Results:** After screenings, four cross-sectional studies with a total participant of 3773 were included. Three studies were cross-sectional, and one was a cohort study. Three studies examined both sexes, while one study was conducted only on girls. The results of the meta-analysis of the correlation coefficient showed a non-significant association between hedonic hunger and BMI ( $r=-0.03$ , 95% CI: -0.08, 0.03). Moreover, the meta-analysis result showed that the mean hedonic hunger was not significantly different between overweight/obesity and normal weight groups (SMD=0.01, 95% CI: -0.21, 0.22).

**Conclusion:** There was a non-significant association between hedonic hunger and BMI in children and adolescents. Considering the small number and the low quality of included studies, we need longitudinal design studies that consider the association between these two variables as a primary outcome for a more accurate conclusion.

**Keywords:** Hedonic Hunger; Body Mass Index; Obesity



## DO DIETARY INTAKES DIFFER BASED ON EATING BEHAVIORS? RESULTS FOR PATIENTS FOLLOWING APPROXIMATELY TWO YEARS OF SLEEVE GASTRECTOMY

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**Background and Aim:** This study aimed to assess the association between eating behaviors and the quantity and quality of the diet in individuals at midterm post-sleeve gastrectomy (SG).

**Methods:** The food intake of 146 participants within 2-4 years following SG was assessed using a Food Frequency Questionnaire. The quality of the diet was evaluated using the Healthy Eating Index (HEI), carbohydrate quality index (CQI), fat quality index (FQI), healthy plate protein quality index, and macronutrient quality index (MQI). Eating behavior was measured through the Dutch Eating Behavior Questionnaire. The analysis of covariance was employed to compare the quantity and quality of the diet between groups, with adjustments for age and sex.

**Results:** The mean age and time since surgery for participants were  $43.6 \pm 12.1$  years and  $30.8 \pm 6.5$  months, respectively. Participants with a higher emotional eating score had significantly higher energy intake compared to those with a lower score ( $p < 0.001$ ). Individuals with a higher external eating score had higher energy ( $p < 0.001$ ) and fat consumption ( $p = 0.009$ ) but lower carbohydrate intake ( $p = 0.012$ ), FQI ( $p = 0.024$ ), and overall HEI ( $p = 0.023$ ) compared to those with a lower score. Higher restrained eating was associated with lower energy intake ( $p = 0.012$ ) but higher protein consumption ( $p = 0.014$ ), MQI ( $p = 0.002$ ), CQI ( $p = 0.038$ ), FQI ( $p = 0.006$ ), and total HEI ( $p < 0.001$ ).

**Conclusion:** Midterm following SG, external eating may result in increased energy intake and decreased dietary quality, whereas restrained eating may contribute to decreased energy intake and better dietary quality.

**Keywords:** Bariatric surgery, Obesity, Emotional eating, External eating, Restrained eating, HEI



## ASSOCIATION BETWEEN SPEXIN AND NUTRITIONAL STATUS WITH EXCESSIVE GESTATIONAL WEIGHT GAIN AND NEWBORNS WEIGHT: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Excessive gestational weight gain (EGWG) is associated with adverse effects on the life of the mother and the baby. Spexin (SPX) is considered as a new factor involved in glucose homeostasis, body weight and fat metabolism. This study was conducted aimed to evaluate the relationship between the concentration of SPX in the blood of the mothers and the neonates and the nutritional status of the mother with EGWG and the weight of the neonate.

**Methods:** This cross-sectional study was conducted in Zahedan, Iran in 2021. The study sample includes 30 pregnant mothers with normal weight gain and 30 pregnant mothers with EGWG. Demographic questionnaire and 24-hour dietary recall (24-hr) were completed. The mother's weight was obtained from the information recorded in their care book, and the birth weight of the neonates were measured. The concentration of SPX in the venous blood sample of the pregnant mother and the umbilical cord blood of the newborn at the time of delivery was measured by a special SPX kit with the ELISA assay, and statistical analysis was performed using SPSS version 21. Results: In the group with normal weight gain, the concentration of SPX in mothers and neonates was significantly higher than in the group with EGWG ( $p < 0.05$ ). However, no statistically significant difference was in birth weight in the two groups ( $p > 0.05$ ). Weight gain during pregnancy, energy, carbohydrate and protein intake in EGWG mothers was significantly higher than the control group ( $p < 0.05$ ).

**Conclusion:** It seems that differences in SPX secretion do not mediate an imbalance in energy intake and other macronutrients during pregnancy that affect pregnancy weight gain and birthweight. However, EGWG was associated with neonatal SPX levels and newborn Apgar scores.

**Keywords:** Spexin, pregnancy, weight gain, umbilical cord blood, macronutrients, nutritional status.



## DIETARY DIVERSITY AND FOOD SECURITY STATUS AMONG IRANIAN OVERWEIGHT AND OBESE WOMEN: CROSS SECTIONAL STUDY

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**Background and Aim:** The Dietary Diversity Score (DDS) is a measure used to evaluate nutritional adequacy, while food security (FI) is another important aspect in the field of nutrition that can be linked to overweight and obesity. Previous research has shown that food insecurity can lead to poor diet quality, overweight and obesity. This study aimed to investigate the association between food insecurity and dietary diversity in overweight and obese women.

**Methods:** The current cross-sectional study was conducted on 348 women aged 18 to 50 with a body mass index (BMI) range between 25 to 40 kg/m<sup>2</sup>. DDS was evaluated using valid and reliable food frequency questionnaire (FFQ) containing 147 items and was calculated by scoring food intakes as 5 main groups. FI was assessed using the United States Department of Agriculture (USDA) 18-item questionnaire. Data were analyzed using descriptive statistics, Chi-square tests and multiple logistic regression models.

**Results:** The majority of study participants were food secure (88.25 %) while 11.75% had experienced some degree of FI with moderate to severe hunger. The mean age and body mass index of participants were  $43 \pm 12$  years and  $31.9 \pm 4.3$  kg/m<sup>2</sup>, respectively. Women with greater DDS were more likely to be food secure (OR: 1.88, 95%CI: 0.92–3.71,  $p < 0.01$ ).

**Conclusion:** In conclusion, this cross-sectional study suggests that adhering to high DDS is associated with lower odds of FI among overweight and obese women.

**Keywords:** food insecurity; diet diversity score; obesity; women; hunger



## THE EFFECTS OF FUNCTIONAL DRINK ENRICHED WITH CURCUMIN AND PROBIOTICS ON APPETITE, GHRELIN AND LEPTIN HORMONES, AND ANTHROPO-METRIC MEASURES, IN PATIENTS WITH METABOLIC SYNDROME: A RANDOMIZED DOUBLE-BLINDED PLACEBO-CONTROLLED CLINICAL TRIAL

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**Background and Aim:** Metabolic syndrome (MetS) increases the risk of cardiovascular diseases and diabetes. Considering the beneficial health effects of curcumin and probiotics, this study aimed to evaluate the effects of functional powdered drink enriched with curcumin and probiotics on appetite status, leptin and ghrelin levels, and anthropometric measures.

**Methods:** In a parallel randomized double-blinded placebo-controlled clinical trial, 124 overweight or obese patients with MetS received a low-calorie diet and one sachet per day of a functional drink for 8 weeks. The drink was enriched with 1 gram of curcumin, 109 CFU probiotics, a combination of 1 gram of curcumin and 109 CFU probiotics (cur + pro), or a placebo powder.

**Results:** The study was completed by 114 participants. No significant differences were observed when comparing the groups in terms of changes in anthropometric variables ( $P > 0.05$ ). However, weight, BMI, and body fat percentage significantly decreased in the placebo group ( $P = 0.003$ ,  $P = 0.002$ ,  $P = 0.002$ ). Waist circumference and hip circumference also decreased in all groups ( $P < 0.001$ ). After adjusting for baseline variables, there were no significant differences in changes in leptin and ghrelin levels



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between the groups ( $P > 0.05$ ), except for appetite ( $P = 0.006$ ). Appetite decreased significantly in all groups ( $P < 0.05$ ), while leptin significantly decreased only in the cur + pro group ( $P = 0.027$ ).

**Conclusion:** According to results taking 1 gr of curcumin with 109 CFU probiotics for 8 weeks did not significantly impact ghrelin and leptin hormone levels or anthropometric measurements except for appetite.

**Keywords:** curcumin; probiotics; appetite; metabolic syndrome



## THE EFFECTS OF POWDERED DRINK ENRICHED WITH CURCUMIN AND PROBIOTICS ON LIPID PROFILE AND ATHEROGENIC INDICES IN PATIENTS WITH METABOLIC SYNDROME: A RANDOMIZED DOUBLE-BLINDED PLACEBO-CONTROLLED CLINICAL TRIAL

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**Background and Aim:** Metabolic Syndrome (MetS) is a group of cardiometabolic disorders that includes abdominal obesity, impaired glucose tolerance, dyslipidemia, and hypertension. Cardiovascular disease is widespread globally and is the most common complication of MetS. A few previous studies have indicated that curcumin and probiotics may enhance the lipid profile. Therefore, we conducted a clinical trial to investigate the effects of the powder drink enriched with these ingredients on the lipid profile level and atherogenic indices such as Atherogenic Coefficient (AC), Castelli Risk Index-I (CRI-I), Castelli Risk Index-II (CRI-II), and Atherogenic Index of Plasma (AIP).

**Methods:** In the present parallel randomized double-blinded placebo-controlled clinical trial, 124 overweight or obese people with MetS were randomly assigned to 4 groups and followed up for 8 weeks. Each participant received a low-calorie diet and a daily sachet of enriched powder drink. The sachets contained either 109 CFU probiotics, 1 gr of curcumin, a combination of probiotic and curcumin (pro+cur), or placebo, respectively. The fasting lipid profile and atherogenic indices were measured at the beginning and end of the study.



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**Results:** Out of 124 participants, 114 completed the study. The within- and between-group comparisons showed no significant differences in lipid profile and atherogenic indices after 8 weeks ( $P > 0.05$ ).

**Conclusion:** Based on the results of the study, taking an oral powder containing 1 gr of curcumin and 109 CFU probiotics for 8 weeks had no effect on the lipid profile level and atherogenic indices. However, further studies are recommended to confirm these results.

**Keywords:** curcumin; probiotics; lipid profile; atherogenic; metabolic syndrome





## PLANETARY HEALTH DIET INDEX AND RISK OF COLORECTAL CANCER: A MATCHED CASE-CONTROL STUDY

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**Background and Aim:** Colorectal cancer (CRC) is the second leading cause of cancer-related deaths. Plant-based diets have been shown to have a protective effect against CRC. The EAT-Lancet Commission has developed the Planetary Health Dietary Index (PHDI) to promote the health of both individuals and the planet. The main recommendations of this model diet are to increase the intake of whole grains, greens, fruits, and vegetables, and to reduce the intake of eggs, fish, refined grains, tubers, and meat. This study aims to investigate the relationship between the PHDI and CRC.

**Methods:** The study included 71 patients with CRC (case group) and 142 non-neoplastic individuals (control group) aged 40-75 years admitted to hospitals in Tehran, Iran. A semi-quantitative food frequency questionnaire comprising 168 questions was used to calculate the PHDI score (ranging from 0 to 150 points). Demographic information, physical activity level, and anthropometric measurements were collected from individuals. Logistic regression analysis examined the association between CRC and PHDI score.

**Results:** The mean age of the control and case groups was 57.7 and 58.2, respectively. After adjusting for confounders such as age, smoking, family history of cancer, taking ibuprofen and acetaminophen, BMI, physical activity, and energy intake, the last PHDI tertile (the highest score) had less chance of developing CRC than the reference tertile (OR = 0.43; 95% CI: 0.19-0.93).

**Conclusion:** The findings suggest a reverse relationship between PHDI and CRC odds. Further research is recommended to confirm the results.

**Keywords:** Planetary health diet index; Colorectal cancer; Colorectal neoplasms; Iranian



## THE EFFECTS OF MILK KEFIR DRINK ON LIVER AMINOTRANSFERASES AND METABOLIC INDICATORS IN PATIENTS WITH NONALCOHOLIC FATTY LIVER DISEASE: A RANDOMIZED CONTROLLED CLINICAL TRIAL

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**Background and Aim:** Non-alcoholic fatty liver disease (NAFLD) is a common chronic liver disease. Probiotics, such as milk kefir drink, have shown potential benefits in managing it by regulating gut microbiota. This study aims to investigate milk kefir drink's impact on liver aminotransferases, anthropometric indices, glycemic index, lipid profile, blood pressure (BP), high sensitivity C-reactive protein (hs-CRP), and malondialdehyde (MDA) in NAFLD patients.

**Methods:** As part of an 8-week randomized clinical trial, 80 patients diagnosed with NAFLD were randomly divided into two groups of 40. Before the trial started, a 2-week run-in period was conducted. During the trial, the two groups were given different diets. One group received only a dietary plan, while the other group received the same dietary plan along with a cup of milk kefir drink twice a day (500cc/d). Pre- and post-intervention assessments were conducted to gather demographic, anthropometric, laboratory, BP, dietary intake, and physical activity data.

**Results:** In the study, a total of 72 participants completed it. The mean age of diet and diet + kefir groups was  $43.50 \pm 11.00$  and  $42.25 \pm 10.44$ , respectively. The results showed no significant difference in changes in BP, anthropometric indices, and laboratory data between the two study groups, except for HDL-C, which was significantly different ( $P = 0.02$ ), and fat-free mass, which was significantly different ( $P < 0.001$ ).

**Conclusion:** The consumption of 500cc/d of kefir milk beverage did not significantly affect liver aminotransferases and metabolic indicators, except for HDL-C and fat-free mass in patients with NAFLD. Further research is recommended.

**Keywords:** non-alcoholic fatty liver disease (NAFLD); probiotics; kefir; liver aminotransferase; metabolic indicator



## THE EFFECT OF SHORT-TERM SUPPLEMENTATION OF OMEGA-3 FATTY ACIDS ON ATHLETES' MOOD: A DOUBLE-BLIND CLINICAL TRIAL.

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**Background and Aim:** WHO emphasis on mental well-being, so it is important to examine the dietary components that influence mental health. Omega-3 fatty acids, exert an impact at various levels within the body, ranging from gene expression to cognitive functions. Numerous studies shows omega-3 can ameliorate depression. However, studies regarding the mood-enhancing effects of omega-3 fatty acid supplementation yielded inconsistent outcomes. This study aimed to explore the effects of short-term omega-3 fatty acids consumption on the mood of young male athletes.

**Methods:** In a three-week double-blind clinical trial, 36 male athletes with average age of  $21.86 \pm 3.15$  years were randomly allocated into two groups: the intervention group, who received a daily dosage of 2000 mg omega-3 supplement (EPA: 360, DHA: 240); and the control group, who consumed 2000 mg oral paraffin. Mood assessment was conducted using the Broom's mood questionnaire at the beginning and end of the study. The collected data were analyzed using relevant statistical methods in STATA.  $p < 0.05$  was considered significant.

**Results:** The findings revealed significant data across all mental state scales after three-weeks of omega-3 supplementation in athletes. Additionally, the intervention group exhibited considerably lower subscale scores for psychological factors (anger, depression, fatigue, vitality, tension), including the confusion index. Furthermore, while the scales of peace and happiness were higher in the supplement group, the difference did not attain statistical significance.

**Conclusion:** Given the positive impact of omega-3 supplementation on athletes' mood, it is advisable to recommend fatty acid supplementation for promoting mental health.

**Keywords:** Omega-3, Mood, Broom's questionnaire, Athletes



## INVESTIGATING THE EFFECT OF ORAL ELLAGIC ACID SUPPLEMENTATION ON GLYCEMIC STATUS, INSULIN RESISTANCE, AND LIVER ENZYMES IN PEOPLE WITH NON-ALCOHOLIC FATTY LIVER DISEASE: A DOUBLE-BLIND RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** It seems that insulin resistance and oxidative stress are involved in the occurrence and progression of non-alcoholic fatty liver disease (NAFLD). Considering the antioxidant properties of Ellagic acid (EA), this study was designed to assess the effect of EA on glycemic status, insulin resistance, and liver enzymes in patients with NAFLD.

**Methods:** In this randomized, double-blind, placebo-controlled clinical trial, 44 patients with NAFLD were selected on the basis of including criteria. Patients were randomly assigned to the intervention group (n=22) and placebo group (n=22), and they consumed a capsule containing 180 mg of EA and placebo for 8 weeks, respectively. At the beginning and end of the study, anthropometric indices, food intake, physical activity level, glycemic factors, insulin resistance, and liver enzymes were measured.

**Results:** At the beginning and end of the study, the two groups did not differ significantly in terms of anthropometric factors, food intake, and physical activity ( $P>0.05$ ). At the end of the study, the mean of insulin, insulin resistance, aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), and gamma-glutamyl transferase (GGT) were significantly decreased in the intervention group ( $P<0.05$ ). However, changes in fasting blood sugar (FBS) were not significant in any of the groups ( $P>0.05$ ).

**Conclusion:** Based on the results, the present study provided evidence that EA supplementation can be effective in improving patients with NAFLD due to its antioxidant properties.

**Keywords:** Ellagic acid, Glycemic status, Insulin resistance, Liver enzymes, Non-alcoholic fatty liver disease



## THE EFFECTS OF EXTRA VIRGIN OLIVE OIL AND CANOLA OIL ON INFLAMMATORY MARKERS AND GASTROINTESTINAL SYMPTOMS IN PATIENTS WITH ULCERATIVE COLITIS

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**Background and Aim:** Ulcerative colitis (UC) is an immune-mediated disease that causes inflammation in the gastrointestinal tract. Diet has an important role in the treatment of UC. This study aimed to compare the effects of extra virgin olive oil (EVOO), as a functional food, with canola oil in the treatment of UC.

**Methods:** Forty patients were participating in this crossover clinical trial. Thirty two patients completed two intervention rounds. Blood samples were taken before and after 20 days intervention. Disease activity score and gastrointestinal symptoms were evaluated using the Mayo score and gastrointestinal symptom rating scale (GSRS) respectively

**Results:** Erythrocyte sedimentation rate ( $p = 0.03$ ) and high-sensitivity C-reactive protein ( $p < 0.001$ ) were decreased significantly after EVOO consumption. Bloating, constipation, fecal urgency, incomplete defecation, and final GSRS were reduced significantly after EVOO consumption ( $p < 0.05$ )

**Conclusion:** Intake of EVOO decreased the inflammatory markers and improved gastrointestinal symptoms in UC patients. It seems this functional food can be beneficial in the treatment of UC as a complementary medicine

**Keywords:** Olive oil, Ulcerative colitis, Inflammation



## ZATARIA MULTIFLORA IMPROVES RESPIRATORY SYMPTOMS, PULMONARY FUNCTIONS, AND OXIDATIVE STRESS PARAMETERS

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**Background and Aim:** Zataria multiflora Boiss. is a medicinal plant with multiple pharmacological effects. This systematic review aims to review the available randomized controlled trials (RCTs) to assess the effects of zataria multiflora on respiratory symptoms, pulmonary function, and oxidative stress parameters.

**Methods:** We conducted a systematic review by searching the PubMed, Scopus, EMBASE, Cochrane Central for Randomized Clinical Trials. All statistical analyses were performed using STATA.

**Results:** Z. multiflora had a significant effect on cough, day wheezing, night wheezing and chest wheezing. Also, significantly improved FEV<sub>1</sub>, FVC, MMEF, and PEF. In addition, significantly reduced MDA levels and increased CAT levels.

**Conclusion:** The meta-analysis showed that the consumption of ZT significantly reduced respiratory symptoms compared to the control group. Also, Zataria multiflora might be beneficial in improving pulmonary function. Except MDA, the result of this study indicated that Zataria multiflora did not have any significant effect on oxidative stress parameters.

**Keywords:** Zataria multiflora, Respiratory symptoms, Pulmonary function, oxidative stress



## VITAMIN D, ADIPONECTIN, LIPID PROFILE, AND NUTRIENT INTAKES IN THE FEMALES WITH ACNE VULGARIS: A CASE-CONTROL STUDY

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**Background and Aim:** Acne vulgaris is a dermatological disorder that is related to inflammation. Recent studies have also considered diet as a potential reason for acne. Considering the inconsistency of the few previous reports, the present study aimed to determine the levels of vitamin D, adiponectin, lipid profile and nutrient intakes in the females with acne vulgaris.

**Methods:** Forty females with acne vulgaris and 40 age-matched healthy females were included in this case-control study in the city of Shiraz, Iran. Data on their sociodemographic status, acne history, and anthropometric indices were collected. Blood samples were taken to determine the levels of 25-hydroxyvitamin D, adiponectin and lipid profile. Three 24-hour dietary recalls were also obtained from each of the individuals to evaluate nutrient intakes. Data were analyzed using the Chi-square test, Independent-samples t-test or Mann-Whitney U-test, and Logistic Regression.

**Results:** Patients with acne had a significantly higher family history of acne compared to controls ( $P=0.006$ ). Serum level of high-density lipoprotein cholesterol was significantly lower in cases than in controls ( $P=0.02$ ). Moreover, significantly lower fiber intake was observed in cases compared with controls ( $P=0.007$ ). In the multivariate analysis, a family history of acne was a risk factors for acne, whereas a higher fiber intake was protective.

**Conclusion:** Family history of acne, dyslipidemia, and lower dietary fiber intakes may play a role in acne pathogenesis. An early assessment of these parameters may be useful for planning treatment procedures.

**Keywords:** Acne Vulgaris; Inflammation; Lipids; Nutrition



## OSTEOPROTECTIVE EFFECTS OF KEFIR FORTIFIED WITH OMEGA-3 AND VITAMIN C IN OVARIECTOMIZED RATS

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**Background and Aim:** Nutritional interventions can be valuable for the prevention of postmenopausal osteoporosis. This study aimed to investigate the effects of kefir fortified with omega-3 and vitamin C on the bone and uterus parameters of ovariectomized rats.

**Methods:** Seventy-seven female rats were ovariectomized or sham-operated. The ovariectomized rats were assigned to six groups and received 1 ml/day of distilled water (OVX group), milk, kefir, kefir fortified with omega-3 (kefir+ $\omega$ 3), kefir fortified with vitamin C (kefir+vit-C) or kefir fortified with omega-3 and vitamin C (kefir+ $\omega$ 3+vit-C) for 12 weeks. The sham group also received 1 ml/day of distilled water. Subsequently, bone mineral content (BMC) and bone mineral density (BMD) of various bones were assessed. Femurs and uteri were harvested for bone ash analysis and histopathological examinations, respectively. Sera were analyzed for carboxy-terminal cross-linked telopeptide of type 1 collagen, procollagen type 1 amino-terminal propeptide, calcium, phosphorous, tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) and total antioxidant capacity levels.

**Results:** Ovariectomy resulted in significant reduction in bone density. Kefir+ $\omega$ 3+vit-C significantly improved BMC of lumbar spine ( $0.699\pm 0.027$  g compared with  $0.580\pm 0.018$  in the OVX group), and kefir, kefir+vit-C and kefir+ $\omega$ 3+vit-C significantly increased BMD of tibia ( $0.118\pm 0.003$  g/cm<sup>2</sup>,  $0.119\pm 0.001$  and  $0.120\pm 0.004$  compared with  $0.102\pm 0.005$  in the OVX group). Moreover, ovariectomy markedly elevated TNF- $\alpha$  level, which was significantly reversed by kefir+ $\omega$ 3+vit-C. Significant atrophy of the uterus was observed following ovariectomy, although the uterus parameters did not change by any of the interventions.

**Conclusion:** Kefir fortified with omega-3 fatty acids and vitamin C may have protective effects against bone loss through suppressing inflammation.

**Keywords:** ascorbic acid; kefir; omega-3; osteoporosis





## SUPPLEMENTATION WITH GLUCOSAMINE HAS NO ADVERSE EFFECTS ON GLYCEMIC CONTROL AND INSULIN RESISTANCE IN TYPE 2 DIABETIC PATIENTS

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**Background and Aim:** Use of glucosamine as an alternative treatment for osteoarthritis is becoming more frequent, including in those who have diabetes. This study aimed to assess the effect of glucosamine on glycemic control and insulin resistance in type 2 diabetic patients.

**Methods:** Fifty-four patients with type 2 diabetes participated in this randomized, double-blind, placebo-controlled study. The participants were assigned to receive 1500 mg glucosamine hydrochloride or placebo for 12 weeks. After determining their baseline characteristics, body mass index and dietary intakes, fasting blood glucose and fasting insulin were measured at weeks of 0, 8, and 12. Indices of insulin function including quantitative insulin sensitivity check index (QUICKI) and homeostasis model assessment of insulin resistance (HOMA-IR) were calculated. Independent t-test and general linear model repeated measures were used to analyze the data.

**Results:** In the glucosamine group, the means of fasting blood glucose and insulin were  $107.31 \pm 24.07$  mg/dl and  $8.75 \pm 4.37$   $\mu$ U/ml, respectively at baseline, which reached  $112.38 \pm 31.50$  and  $9.10 \pm 4.17$  at week 12. In the placebo group, the mean for fasting blood glucose and insulin were  $103.84 \pm 24.15$  and  $9.79 \pm 4.02$  at the beginning of the study, which reached to  $111.40 \pm 26.43$  and  $8.58 \pm 3.68$  at week 12. There were no significant differences in fasting blood glucose, insulin, HOMA-IR and QUICKI indices at all the studied time points (weeks of 0, 8 and 12) within or between the groups.

**Conclusion:** Twelve weeks of a normal recommended dose of glucosamine supplements may not have adverse effects on glycemic control and insulin resistance in type 2 diabetic patients.

**Keywords:** Diabetes Mellitus; Glucosamine; Insulin Resistance



## EFFECTS OF CURCUMIN SUPPLEMENTATION ON THE LIVER ENZYMES AND LIPID PROFILES IN NON-ALCOHOLIC FATTY LIVER PATIENTS: AN UMBRELLA META-ANALYSIS

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**Background and Aim:** Non-alcoholic fatty liver disease (NAFLD) is a metabolic progressive disease and one of the leading causes of chronic liver disease worldwide. The current umbrella meta-analysis aimed to assess the present evidence and provide an accurate estimate of the overall effects of curcumin on liver enzymes and lipid profiles in NAFLD patients.

**Methods:** The Web of Science, PubMed, Scopus, ScienceDirect, and Google Scholar databases were searched till March 2023. The meta-analysis that examined the effects of curcumin on liver enzymes and lipid profiles in NAFLD patients was included in this review. The meta-analysis was performed utilizing a random-effects model and STATA software.

**Results:** At total, 9 meta-analyses of 81 randomized controlled trials (RCTs) comprising 4172 NAFLD patients examined the effect of curcumin supplementation on liver enzymes and 6 eligible meta-analyses of 35 RCTs including 3272 patients evaluated the effect of curcumin supplementation on lipid profile. Combining the findings of these meta-analyses revealed that curcumin supplementation reduced AST (ES = -1.072, 95%CI (-1.656, -0.488),  $p = 0.000$ ), ALT (ES = -0.625, 95%CI (-1.170, -0.134),  $p = 0.014$ ), and TG (ES = -0.469, 95%CI (-1.057, 0.119),  $p = 0.128$ ) levels in comparison with the control group. However, the effects of curcumin on GGT, ALP, TC, LDL-C, and HDL-C levels were not significant.

**Conclusion:** The findings suggest the beneficial effects of curcumin supplementation in patients with NAFLD, such as improving liver function and decreasing serum TG levels. Nevertheless, high-quality research is further required to clarify the curcumin supplementation effects in NAFLD patients.

**Keywords:** Non-alcoholic fatty liver disease, NAFLD, Curcumin, Liver enzymes, Lipid profile



## INVESTIGATING THE EFFECT OF PROBIOTICS CONSUMPTION ON BIPOLAR DISORDER

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**Background and Aim:** Bipolar disorder is one of the most common chronic mental disorders that causes severe fluctuations in a person's mood, and approximately 1 person out of every 50 adults is affected by it. These fluctuations can affect a person's sleep, energy level, behavior, ability to think, and activity level. Despite the recent advances in the control of psychiatric disorders, the treatment of bipolar disorders remains a challenge. Due to the increase in the use of probiotic food products and supplements among people and their impact on various health factors, in this study we investigated the effect of probiotics consumption on bipolar disorder.

**Methods:** This study is a review study written in 2023. By searching international and national databases, articles related to the effect of probiotics consumption on bipolar disorder were collected between 2015 and 2023. After reviewing the search results, finally 28 articles were used to write this study.

**Results:** The diversity of intestinal microbiota is reduced in people with bipolar disorder and plays a key role in causing this disorder. Also, in bipolar disorder, the concentration of inflammatory cytokines increases. Probiotics can be effective in improving bipolar disorder through the effects they have in reducing inflammation, boosting the immune system, health of the digestive system, and adjusting the intestinal microbiota. Also, probiotics act similarly as antidepressant Citalopram by producing and expressing neurotransmitters.

**Conclusion:** According to current findings, consumption of probiotics, especially probiotics containing bifidobacterium or lactobacillus, can be effective in improving bipolar disorders. However, for a better understanding of this mechanism, studies on larger scales and over longer periods are needed.

**Keywords:** Probiotic; Bipolar disorder; Intestinal microbiota



## ASSOCIATION OF MEDITERRANEAN DIET PATTERN WITH DISEASE ACTIVITY IN THE PATIENTS WITH RHEUMATOID ARTHRITIS: A CROSS-SECTIONAL STUDY ON IRANIAN PATIENTS

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**Background and Aim:** Rheumatoid arthritis is a systemic autoimmune disease that causes joint erosion, as well as damage to extra-articular organs. The aim of this study was the investigation of the association between the Mediterranean diet quality index with disease activity in patients with rheumatoid arthritis.

**Methods:** Methods: In this cross-sectional study 184 females with Rheumatoid Arthritis were studied in Kermanshah, Iran. The American College of Rheumatology's 2010 criteria were used to diagnose RA. The biochemical tests including Erythrocyte sedimentation rate, C-reactive protein, rheumatoid factor, anti-nuclear antibody titration, antibodies against cyclic citrulline peptide, disease activity score 28 and the food frequency questionnaire was used to assess Rheumatoid Arthritis activity and the Mediterranean diet quality index, respectively. To compare the dietary intakes of participants across tertiles of Mediterranean diet score, we used Analysis of Variance. Multinomial logistic regression with three adjusted models was used to investigate the association between Mediterranean diet score with disease activity. Results: 184 eligible patients with Rheumatoid Arthritis participated in this study. The mean age and duration of disease, Body mass index, waist circumference and Percent body fat did not differ significantly among the tertiles of the Mediterranean diet score ( $P$ -value $>0.05$ ). Participants in the highest tertile of Mediterranean diet score had significantly greater intakes of fruits, vegetables, fish, legume, nuts and had lowest intake of grains (refrain grain) and red and process meats to white meat ratio ( $P$ -value $<0.05$ ). There was no significant difference in terms of variables related to



disease activity among the tertiles of the Mediterranean score (P-value>0.05). In no univariate adjusted model, the OR of Mediterranean diet score no significant different in the third as compared to the first tertile of Mediterranean diet score (P-value>0.05).

**Conclusion:** Based on our findings there is no association between the Mediterranean diet score and disease activity of people with rheumatoid arthritis.

**Keywords:** Mediterranean diet quality index, Rheumatoid Arthritis, Disease Activity Score-28



## THE EFFECT OF MEDITERRANEAN DIET ON NON-ALCOHOLIC FATTY LIVER DISEASE

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**Background and Aim:** Introduction: Nonalcoholic fatty liver disease (NAFLD) is a prevalent chronic disease in the world which was estimated to affect a quarter of the population. NAFLD is characterized by hepatic steatosis and cause health defects and mortality. The Mediterranean diet (Med Diet), one of the most studied and recognized dietary patterns worldwide, could help liver disease, because of its dietary components. (1) In this review study, we aimed to evaluate the impacts of the Mediterranean diet on the indicators of non-alcoholic fatty liver disease.

**Methods:** Main findings: Med Diet recommended daily intake of whole grains, beans, nuts, fruits, vegetables, and olive oil (2). It also proposed moderate consumption of fish, especially fish rich in omega-3 fatty acids (2). Added sugars, sodium, refined carbohydrates, saturated fats, and processed meats are also limited in this dietary pattern (2). Med Diet is rich in unsaturated fatty acids, MUFA and PUFA, and has the limited amount of saturated fatty acids (3). This dietary pattern increase fatty acid oxidation, inhibit lipogenesis, and reduce insulin resistance (4). In addition, polyphenolic compounds from olive oil have anti-inflammatory and antioxidant properties, which improve insulin sensitivity and reduce oxidative stress. Thereby, Med Diet may prevent fatty liver progression and steatohepatitis (4). A randomized clinical trial reported that Med Diet reduces liver steatosis and improves insulin sensitivity in non-diabetic subjects with NAFLD, compared to a low fat-high carbohydrate diet, for 6 weeks intervention duration in a crossover manner (5). Although no significant differences in intrahepatic lipid and metabolic parameters were seen between Med Diet and low-fat diet administration, after 12 weeks intervention duration in another study (6). The addition of Med Diet to a calorie-restricted diet could improve lipid profiles and fatty liver biochemical indexes, as well as lower saturated fatty acid status and higher levels of monounsaturated and n-3 fatty acids, compared to a calorie-restricted low fat diet (7). Another clinical trial demonstrated that a moderately hypocaloric Med Diet could improve anthropometric indices, blood lipid and reduced hepatic fat accumulation and liver stiffness (8). However, in comparison to an isocaloric low fat diet, Med Diet was not superior to reduce hepatic steatosis, over 12 weeks (9). In addition, compared with usual clinical care, a 6-month weight-loss programme based on Mediterranean lifestyle was successful in improving liver function outcomes, after ad-



justing for weight loss (10). The importance of calorie restriction and physical activity interventions to ameliorate fatty liver progression was also shown by another study (11). Furthermore, a recent study showed that a low glycemic Med Diet in combination with aerobic activity program was the most efficient treatments protocol in NAFLD subjects (12). In 2021, a metaanalysis conducted on 6 randomized control trials reported that the Med Diet reduced insulin resistance and fatty liver index among subjects with NAFLD, although BMI and waist circumference did not significantly change (13). A recent metaanalysis, in 2023, showed that the Med Diet in context of calorie restricted, low fat, or low glycemic index Med Diet failed to improve liver enzymes and liver stiffness (14).

**Conclusion:** Conclusions: Med Diet might improve some outcomes linked with NAFLD, however the results of studies are inconsistency. Further studies need to confirm these findings. Nevertheless, addition of Med Diet to healthy lifestyle including calorie restriction and increasing physical activity could be a proper recommendation, due to its components which may help to prevent fatty liver and control the hepatic steatosis

**Keywords:** Med Diet, NAFLD



## A SYSTEMATIC REVIEW AND META-ANALYSIS ON THE COMBINED USE OF STATINS AND EZETIMIBE: IMPACT ON PROINFLAMMATORY CYTOKINES.

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**Background and Aim:** The current systematic review and meta-analysis aimed to investigate whether the co-administration of statins and ezetimibe presents a viable and comparable alternative to statin monotherapy in reducing proinflammatory cytokines.

**Methods:** Searches were conducted in databases such as MEDLINE, SciVerse, Scopus, and Clarivate Analytics Web of Science up to February 2022, using terms related to the combination therapy and proinflammatory cytokines. The Cochrane risk of bias tool 1 assessed the study quality, and the meta-analysis utilized weighted mean difference (WMD) and standard deviation (SD) of changes. The results, expressed as differences in means and 95% confidence intervals (CIs) with an inverse variance and a random-effects model, incorporated data from 12 studies (13 arms) in the qualitative and quantitative synthesis.

**Results:** The findings did not reveal a significant reduction in interleukin-1 beta, (tumor necrosis factor-alpha and monocyte chemoattractant protein-1. However, there was a notable reduction in interleukin-6 (IL-6) (WMD: -1.4 pg/ml; 95 % CI: -2.4, -0.3,  $P < 0.007$ ,  $I^2 = 97.1\%$ ,  $P < 0.001$ ) and interferon-gamma (IFN- $\gamma$ ) (WMD: -0.2 pg/ml; 95 % CI: -0.4, -0.1,  $P < 0.001$ ,  $I^2 = 0\%$ ,  $P = 0.7$ ). Subgroup analysis revealed a significant reduction in IL-6 among those aged  $\geq 60$  years and the Asian population.

**Conclusion:** The combination of statin therapy with ezetimibe led to a significant decrease in IL-6 and IFN- $\gamma$ , with the reduction in IL-6 being particularly notable in individuals aged  $\geq 60$  years and the Asian population.

**Keywords:** Ezetimibe; Proinflammatory cytokines; Statins. Randomized controlled trials, systematic review





## ASSOCIATION BETWEEN DIETARY DIVERSITY SCORE AND CARDIOMETABOLIC RISK FACTORS IN HYPERTENSIVE PATIENTS (HOVEYZEH COHORT STUDY)

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**Background and Aim:** Dietary diversity score (DDS) is considered an indicator of overall diet quality. The study was designed to investigate the relationship between DDS and some cardiometabolic risk factors among hypertensive patients.

**Methods:** In this cross-sectional study, 972 hypertensive patients (322 males and 650 females) aged 35–70y participated were recruited. Usual dietary intake was assessed using a 130-item semi-quantitative food-frequency questionnaire and DDS was calculated. Metabolic syndrome was defined according to the IDF/AHA criteria. The anthropometric parameters, fasting blood sugar, lipid profile, and liver enzymes were measured.

**Results:** Male subjects who assigned to the top DDS tertile had 51% lower risk of having low serum HDL-C (OR: 0.49; 95% CI: 0.24–0.96) in the crude model. A similar association was observed for men in the second tertile of DDS after adjusting for covariates (OR: 0.47; 95% CI: 0.23–0.97). A significant inverse association was found between vegetable diversity score and odds of hyperglycemia in the male group in the adjusted model (OR: 0.44; 95% CI: 0.22–0.91). The vegetable diversity score was inversely associated with 67% decreased metabolic syndrome risk in the adjusted model (OR: 0.33; 95% CI: 0.15–0.70).

**Conclusion:** The present study revealed that higher DDS is associated with better metabolic features in hypertensive patients.

**Keywords:** Cardiometabolic risk factors; dietary diversity score; hypertension; metabolic syndrome



## IMPACT OF PROBIOTIC, SYNBIOTIC AND PREBIOTIC DIETARY FIBERS ON INTESTINAL HEALTH AND IMMUNITY: A SYSTEMATIC REVIEW OF CLINICAL TRIALS

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**Background and Aim:** The aim of the present systematic review was to investigate more up-to-date and detailed effects of the probiotic, synbiotic and prebiotic dietary fibers on intestinal health and immunity.

**Methods:** A comprehensive systematic literature search of electronic databases and a hand searched reference list was conducted from inception to 30 October 2023. We included English or Persian language published clinical trials supplemented probiotic, synbiotic or prebiotic dietary fibers and investigated each factors of serum levels of zonulin, calprotectin, glucagon-like peptide 2 (GLP-2), short and long chain fatty acids (SCFAs and LCFA), lipopolysaccharide binding protein (LBP), intestinal microbiota composition and inflammatory factors such as interleukin 6 (IL-6) and high sensitivity C reactive protein (hs-CRP).

**Results:** A total of 372 articles were identified, of which 25 were selected for qualitative analysis. Generally, the results indicated that probiotic, synbiotic and prebiotic dietary fibers can help to maintain the integrity of the intestinal barrier and reducing the permeability by decreasing serum levels of Zonulin and calprotectin, promoting the growth of beneficial bacteria in the gut, such as Bifidobacteria and Lactobacilli, while inhibiting the growth of harmful bacteria. They can also increase the metabolites produced by the intestinal microbiota, such as SCFAs and LCFAs as well as decrease the levels of LBP and inflammatory factors such as IL-6 and hs-CRP, while increase the levels of GLP-2, which are all involved in regulating gut health and inflammation.

**Conclusion:** The consumption of probiotic, synbiotic and prebiotic dietary fibers has been shown contributing to improved gut health and overall well-being.

**Keywords:** Probiotic; synbiotic; prebiotic dietary fibers; intestinal health; immunity



## THE EFFECT OF RESVERATROL SUPPLEMENTATION ON SIRTUIN 1: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** The natural polyphenol resveratrol is a bioactive nutrient mainly found in plants, including peanuts, grapes, and knotweed (1). Recently, various studies have shown the potential effects of resveratrol, including anti-oxidative stress(2), anti-inflammatory (3), anti-cancer (4), and cardioprotection (5). Resveratrol also mimics the effects of calorie restriction by activating the sirtuin system (6). Studies have shown that resveratrol administration increases serum concentration and gene expression of Sirt1, improves metabolic profiles and neurological functions, and has anti-inflammatory activities (7). Therefore, this study aimed to investigate the effect of Resveratrol Supplementation on Sirtuin 1.

**Methods:** For this review, we gathered crucial information by conducting a systematic review and searching through websites like PubMed and Google Scholar. We reviewed several articles published until September 2023 and obtained the results of these studies. To find the articles, we used the search strategy of "Resveratrol" OR "Resveratrol supplementation" AND "SIRT1" OR "Sirtuin-1" OR "gene expression" and all of its components.

**Results:** We found 39 studies on Resveratrol Supplementation and Sirtuin-1, but only 9 publications met the criteria for systematic review. After applying inclusion and exclusion criteria, we found seven randomized clinical trials. The results showed that adults over 18 who were supplemented with Resveratrol had increased serum concentrations of Sirt1. Specifically, 500 mg of resveratrol supplementation seemed to have a positive effect on sirt-1. These findings were based on a thorough analysis of various articles.

**Conclusion:** The consumption of resveratrol has been found to enhance and increase the circulation of SIRT1. The consumption of resveratrol reduces appetite and restricts calorie intake by affecting sirtuin 1.

**Keywords:** Resveratrol, Sirt-1, Systematic review, Supplement



## THE EFFECT OF GRAPE SEED EXTRACT SUPPLEMENTATION ON INFLAMMATION BIOMARKERS: A SYSTEMATIC REVIEW OF CONTROLLED TRIALS

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**Background and Aim:** Grape seed extract (GSE) is believed to possess antioxidant and anti-inflammatory properties as it contains a high level of polyphenols (1). Chemical analysis has revealed that the primary polyphenolic compounds present in GSE are proanthocyanidins (2), which are known to have various beneficial effects like antioxidant, anti-inflammatory, anti-hypertensive, anti-platelet, anti-thrombotic, and cholesterol-lowering effects (3).

**Methods:** For this review, we gathered crucial information by conducting a systematic review and searching through websites like PubMed, Scopus, and Google Scholar. We reviewed several articles published until December 2023 and obtained the results of these studies. To find the articles, we used the search strategy of "Grape seed extract" OR "Grape seed" OR "Grapeseed" OR "Grape seeds" OR "Grapeseeds" OR "Vitis vinifera" AND "TNF- $\alpha$ " OR "tumor necrosis factor - $\alpha$ " OR "C-reactive protein" OR "CRP" OR "high-sensitivity C-reactive protein" OR "hs-CRP" and all of its components.

**Results:** We found 278 studies on Grape seed extract Supplementation and inflammatory biomarkers, but only 69 publications met the criteria for systematic review. After applying inclusion and exclusion criteria, we found fourteen randomized clinical trials. The results of three clinical trials on CRP and TNF- $\alpha$  showed that those who were supplemented with GSE were not significantly affected by CRP but decreased TNF- $\alpha$ . The effect of GSE supplementation on hs-CRP was investigated in eight trials with ten treatment arms showed that GSE supplementation significantly decreased hs-CR.

**Conclusion:** Grape Seed Extract supplementation may exert mildly favorable effects on inflammatory biomarkers. Nevertheless, requires further investigation in future studies.

**Keywords:** Grape seed extract, Inflammatory, Systematic review



## INVESTIGATING THE EFFECT OF KETOGENIC DIET ON CARDIOVASCULAR DISEASE

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**Background and Aim:** Cardiovascular diseases(CVD)are one of the most common and increasing causes of death worldwide.Diet is a key factor in the prevention and treatment of CVD.Considering the increasing popularity of the ketogenic diet among people,this article aims to evaluate the potential of the ketogenic diet in the prevention and treatment of CVD.

**Methods:** The present study is a review study that was designed in 2023.By searching international and national databases,articles that were about the ketogenic diet and CVD in the period of 2010 to 2023 were collected.After reviewing the search results,finally,36 studies were used to write this study.

**Results:** The ketogenic diet has a multifaceted effect on CVD.Due to the elimination of simple sugars, the restriction of total carbohydrates, and the supply of omega-3 fatty acids,it has a beneficial effect on the blood lipid profile and shows a strong anti-inflammatory effect and protects the heart.Through this,weight loss has a beneficial effect on blood pressure,improving insulin sensitivity and other CVD risk factors.However,there are concerns about the long-term effects of a high-fat diet on cardiovascular health,especially about the type of fats consumed and their effects on the cholesterol level.

**Conclusion:** According to the contradictory results of the conducted studies,it seems that the quality of the ketogenic diet has a very important effect on the occurrence or prevention of CVD.More researchs are needed to fully understand the effects of the ketogenic diet on cardiovascular disease.Understanding the role of the ketogenic diet in cardiovascular health could have important implications for the prevention and management of CVD.

**Keywords:** Ketogenic diet; Cardiovascular disease; heart



## ROYAL JELLY AND TOCOTRIENOL-RICH FRACTION AS THE REGULATORS OF THE IMPAIRED GLYCEMIC STATUS AND ADIPOKINES IN THE HFD-INDUCED OBESITY MODEL

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**Background and Aim:** Obesity is dramatically increasing worldwide during the past years. It is considered as the low-grade inflammatory state which gives rise to the impaired glucose metabolism, insulin resistance and diabetes in overweight and obesity. Royal jelly (RJ) and tocotrienols (T3) have been proposed to have antihyperglycemic and anti-inflammatory activities. The aim of this investigation is to examine the effect of RJ and TRF on glycemic factors and inflammation in the obesity model.

**Methods:** Obesity was induced in male Wistar rats through a prescription of a diet high in fat amount for 17 weeks. Obese rats were assigned to the 4 groups randomly receiving 100 mg/kg/day RJ, 85 mg/kg/day TRF or the combinations in the following groups (n=10 in each group): HFD, RJ+HFD, TRF+HFD, RJ+TRF+HFD during 8 weeks. FBS, insulin, HOMA-IR, leptin, and adiponectin levels were measured at the end of the study.

**Results:** Compared to HFD, RJ, TRF, and their combination resulted in a significant decrement of FBS, insulin, and HOMA-IR levels in HFD-induced obese rats ( $P < 0.001$ ). Furthermore, RJ ( $6.87 \pm 0.28$  pg/ml;  $P = 0.005$ ), TRF ( $6.60 \pm 0.38$  pg/ml;  $P = 0.020$ ) and their combinations ( $6.94 \pm 0.31$  pg/ml;  $P = 0.003$ ) remarkably increased the serum adiponectin levels relative to the HFD ( $5.09 \pm 0.41$  pg/ml) group. However, neither RJ nor TRF and their combinations did not significantly change the serum leptin levels compared to HFD.

**Conclusion:** RJ and TRF supplementation in HFD gives rise to the improvement of glycemic factors and inflammatory markers. Our results indicated that RJ and TRF, considered functional foods, might control obesity and its complications.

**Keywords:** Obesity; Royal jelly; Tocotrienol-rich fraction; Inflammation; Insulin resistance



## ASSOCIATION BETWEEN DIETARY INTAKES OF NITRATE AND NITRITE WITH ANGINA

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**Background and Aim:** Previous studies have shown that the intake of nitrate and nitrite may be associated with cardiovascular disease. Therefore, this study sought to investigate the association between dietary intakes of nitrate and nitrite with the odds of angina.

**Methods:** Nitric oxide (NO) is a crucial molecule in the body, playing a vital role in the cardiovascular system<sup>16</sup>. NO is produced by Nitric oxide synthase (NOS) from L-arginine, with three isoenzymes: endothelial (eNOs), neuronal (nNOs), and inducible (iNOs)<sup>17</sup>. Additionally, dietary intake of nitrate and nitrite-rich foods, such as dark green leafy vegetables and processed meats, contributes to NO production<sup>18</sup>. Disturbances in NO synthesis pathways independently reduce NO levels, impacting vasodilation in the cardiovascular system and contractility in the muscular system, blood flow, and blood pressure control<sup>19–22</sup>. Recent studies indicate that diets high in nitrates improve endothelial function, and continuous NO production is crucial for preventing cardiovascular diseases (CVDs). Inactivating NO is a significant factor in reducing endothelium-dependent vasodilation, contributing to hypertension, inflammation, endothelial dysfunction, vascular disease, and insulin resistance—critical risk factors for CVDs<sup>18,23</sup>. Previous studies suggest that NO can decrease the incidence risk of angina and ischemic-related angina<sup>3,24,25</sup>. Consumption of dietary nitrate in vegetables, like beetroot juice, increases circulating nitrite levels, improving vascular muscle function and reducing platelet reactivity in both healthy individuals and CVD patients<sup>26–29</sup>. Some studies propose that inorganic nitrate, such as beetroot juice or nitrate salt, in heart failure patients can enhance diastolic function and endothelial function<sup>29,30</sup>. Considering that studies on nitrate, nitrite, angina, and atherogenic indices are new and mostly limited to animal studies, and that results on the association of dietary nitrate and nitrite intake with angina. The study analyzed 1182 adults aged 20+ in the Tehran University of Medical Sciences (TUMS) Employee's Cohort study (TEC), focusing on dietary intakes, angina, and atherogenic indexes, using a validated food frequency questionnaire (FFQ) and the Rose Angina Questionnaire (RAQ).

**Conclusion:** The study found a significant inverse relationship between nitrate intake and odds of grade 2 angina. The highest dietary nitrate was associated with 29 % lower odds of grade 1 angina and also, 46 % lower odds of angina possible ( $P < 0.05$ ). Adults with the highest nitrate intake had 29 % lower odds of grade 1 angina and 46 % lower



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odds of angina possible. The current study found an inverse association between dietary nitrate and nitrite intake and the odds of developing angina. Whether these dietary components can reduce angina and atherogenesis is expected to be tested in larger cohorts and randomized controlled trials.

**Keywords:** Nitrate Nitrite Angina





## EFFECT OF PRE- MEAL WATER INTAKE ON THE SERUM LEVELS OF COPEPTIN, AND ANTHROPOMETRIC INDICES IN DIABETIC PATIENTS TYPE2

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**Background and Aim:** Copeptin (C-terminal component of arginine vasopressin (AVP) hormone) is associated with a high risk of diabetes. Water pre-load by altering the levels of copeptin affects decreasing food intake and prevents of obesity.This study aimed to evaluate the effect of pre- meal water intake on the levels of serum copeptin, and anthropometric indices in type 2 diabetes.

**Methods:** In this study, 40 patients with type 2 diabetes were randomly divided into two intervention groups for eight weeks; a) receiving a scheduled drinking 1 liter of water per day before each main meal (PW group), and b) no water consumption before any meal (NPW group). At baseline and the end of study, blood samples were collected for evaluation of serum levels of copeptin. BMI , WC and WHpR were measured.

**Results:** Pre- meal water intake was associated to lower energy intake and reduction of BMI and WC compared to baseline and NPW group (both  $P<0.0001$ ).At the end of experiment, the serum copeptin levels ( $P<0.05$  and  $P<0.01$ ) were significantly decrease in the WP group compared to baseline and NPW group, respectively

**Conclusion:** This study indicates that pre-meal water intake for eight weeks had beneficial effect on reducing copeptin levels and weight management in type 2 diabetic patients.

**Keywords:** Diabetes Mellitus, Water intake, Serum Copeptin, Anthropometric indices



## THE ROLE OF POSTBIOTICS IN PATIENTS WITH IRRITABLE BOWEL SYNDROME (IBS): A SYSTEMATIC REVIEW

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**Background and Aim:** Irritable bowel syndrome (IBS) is a major global health concern that affects 1–10% of people in Asian countries. Postbiotics are beneficial molecules which may improve the immune system and reduce IBS symptoms. The study aimed to evaluate the effectiveness of postbiotics in reducing clinical symptoms and enhancing quality of life in patients with IBS.

**Methods:** We conducted a systematic review based on clinical trials published in PubMed, Science Direct, SID, and Google Scholar. The searches were conducted using the MeSH terms “irritable bowel syndrome”, and “postbiotics” until December 2023.

**Results:** Finally, nine articles were included in this study. Studies reported that postbiotic components of *Lactobacillus casei* DG could modulate the inflammatory mucosal response in post-infectious irritable bowel syndrome in an ex-vivo organ culture model. Sodium butyrate as a postbiotic substance, could modify the intestinal microbiota and relieve the symptoms of IBS. Postbiotic molecules such as acetate, polyP, and Ach could be useful in attenuating IBS symptoms. *Lactobacillus paracasei* CNCM I-5220-derived postbiotic (LP-PBF) also could preserve intestinal barrier integrity. Moreover, the postbiotic product of *Lactobacillus plantarum* 299v could affect the intestinal epithelial barrier function by improving TER in colonic biopsies and reducing paracellular permeability in IBS patients.

**Conclusion:** It appears that postbiotics might be helpful in managing IBS symptoms. However, further study on this subject is required.

**Keywords:** microbiota, Irritable Bowel Syndrome, Systematic Reviews as Topic



## MAJOR DIETARY PATTERNS IN RELATION TO INCIDENT HYPERTENSION; KURDISH POPULATION BASED STUDY

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**Background and Aim:** since hypertension (HTN) is the most important modifiable risk factor for all-cause morbidity and mortality worldwide, it is critical to understand the diet that reduce its risk. This study was aimed to evaluate the relationship between the major dietary patterns and incident HTN.

**Methods:** This case-cohort study was designed using Ravansar non-communicable diseases (RaNCD) cohort study data (294 participants with incident HTN and 1295 participants as representative random sub-cohort). Three major dietary patterns were identified, including plant-based, high protein, and unhealthy dietary patterns. Cox proportional hazards regression models was applied to association between major dietary patterns and incident HTN.

**Results:** The mean age was  $46.5 \pm 7.89$  years and 48.83% were male. Participants with the highest tertile of the plant-based dietary pattern were at lower risk of incident HTN in both crude and adjusted models (HR: 0.69; 95% CI: 0.54–0.9) and (HR: 0.70; 95% CI: 0.53–0.94), respectively. However, the other two identified dietary patterns showed no significant association with incident HTN.

**Conclusion:** We found evidence indicating higher adherence to plant-based diet had protective effects on incident HTN.

**Keywords:** Diet; hypertension; incidence



## THE EFFECT OF POMEGRANATE PRODUCTS ON GLYCEMIC PROFILE IN ADULTS: A GRADE- ASSESSED SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Several studies have shown the effects of pomegranate on blood glycemic profile, while some studies showed no effects of pomegranate on these biomarkers. Therefore, we aimed to evaluate the effects of pomegranate consumption on FBS (fasting blood glucose), Insulin, QUICKI, HbA1C, and HOMA-IR in adults.

**Methods:** A systematic literature search was performed using databases, including PubMed, Web of Science, and Scopus, up to September 2023 to identify eligible randomized controlled trials (RCTs). Heterogeneity tests of the included trials were performed using the I<sup>2</sup> statistic. Random effects models were assessed based on the heterogeneity tests, and pooled data were determined as the weighted mean difference with a 95% confidence interval.

**Results:** Of 407 records, 31 eligible RCTs were included in the current study. Our meta-analysis of the pooled findings showed that pomegranate consumption significantly reduced FBS (p<0.05).

**Conclusion:** Overall, the results demonstrated that pomegranate consumption has beneficial effects on FBS, insulin, and HOMA-IR in adults. Therefore, pomegranate can be consumed as an effective dietary approach to improve blood glycemic profile in diabetic patient.

**Keywords:** pomegranate, "glycemic profile", "meta analysis", "dose-responses"



## NUTRITIONAL ASSESSMENT OF LEUKEMIC CANCER PATIENTS ADMITTED IN TERTIARY HOSPITAL: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Malnutrition is prevalent in leukemic cancer patients, particularly during hospitalization. The purpose of this study was a comprehensive assessment of nutritional status in leukemic inpatients.

**Methods:** Leukemic patients admitted to Ghaem hospital, a referral educational tertiary hospital, Mashhad, Iran, between December 2022 to December 2023 were assessed. Demographic and disease characteristics, anthropometric indices, a Patient-Generated Subjective Global Assessment (PG-SGA) tool, body composition, nutritional-related complications were assessed.

**Results:** Ninety-seven patients were enrolled. The mean age of patients were  $43.98 \pm 16.7$  and 52 were male. The mean PG-SGA score was  $12.37 \pm 7.6$  which 85 (87.6 %) needed nutritional interventions (PG-SGA score >3). Seventeen (17.5%) of patients had experienced significant weight loss and 11 (11.3%) were underweight (BMI <20 for under 70 years and BMI <22 for over 70 years old patients). 25 (27.2%) of cases had reduced muscle mass (FFMI <17 for male and FFMI <15 for female). The most common nutritional-related complications were as follows: anorexia (53.4%), dysgeusia (34%), nausea (32%), Dry mouth (29.9%), constipation (19.6%), Early satiety (18.5%), and (41.1%).

**Conclusion:** Our study demonstrated a high prevalence of malnutrition in hospitalized leukemic patients. Therefore, regular screening of nutritional status as well as early effective nutritional interventions and Symptoms management are of crucial for these patients.

**Keywords:** Leukemia, Malnutrition, Nutrition assessment, Nutritional status, PG-SGA



## ASSOCIATION BETWEEN BODY MASS INDEX AND EATING BEHAVIOR IN THE IRANIAN ADOLESCENTS AND YOUNG ADULTS

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**Background and Aim:** Obesity is known as a neurobehavioral disease, yet, the association between weight status and eating behavior (EB) is unclear. The present study was carried out to shed light on the association between body mass index (BMI) and EB in Iranian adolescents and young adults.

**Methods:** Iranian adolescents and young adults aged 12 – 22 were investigated in a cross-sectional study. Respondents were excluded in case of reporting diagnosed with mental disorders or having a history of psychiatric medication consumption. BMI was calculated using the standard formula. To assess the emotional eating (EE), external stimuli (ES), and restrained eating (RE) of participants as the sub-domains of eating behavior, the Dutch Eating Behavior Questionnaire was used. Linear regression was conducted to investigate the association between BMI and EB subscales.

**Results:** Among eligible participants ( $n = 1048$ , 53.5% boys), aged  $18.14 \pm 3.18$  years, the mean BMI was  $22.52 \pm 4.96$ . Crude analysis revealed significant associations between BMI and EE ( $B = 0.014$ ,  $P = 0.010$ ), and RE ( $B = 0.056$ ,  $P < 0.001$ ). Similar results were observed after adjustments for age, gender, education level, and socioeconomic status (EE:  $B = 0.017$ ,  $P = 0.002$ ; and RE:  $B = 0.061$ ,  $P < 0.001$ ). However, ES did not show a significant association with BMI in any of the analyses.

**Conclusion:** BMI increment was associated with demolished eating behavior. Longitudinal studies are recommended to reach more robust results.

**Keywords:** Body Mass Index; Eating behavior; Adolescent; Iran



## THE ASSOCIATION OF TRANSIENT GLOBAL AMNESIA (TGA) AND DIETARY INTAKE OF FATS

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**Background and Aim:** Different types of dietary fat may influence memory and cognitive functions. This study aimed to investigate the association between dietary fat intake and amnesia.

**Methods:** This cross-sectional study was conducted using Persian Sabzevar cohort data on 258 individuals with transient global amnesia (TGA) and 520 elderly without amnesia in Sabzevar, Iran. The Food Frequency Questionnaire (FFQ) was used to assess the food consumption status of the participants. All study participants were screened for TGA using the International Classification of Diseases code (ICD-10: code G45.4). In addition, a neurologist evaluated all patients and determined their status based on the diagnostic symptoms defined by the Kaplan and Hodges criteria.

**Results:** There was an inverse association between the incidence of TGA and dietary levels of alpha-linolenic acid (ALA) ( $P=0.01$ ). Also, a positive association was observed between TGA and n6 fatty acid after adjusting for age and gender ( $P=0.01$ ), but there was no difference between the intake of total fat, cholesterol, trans fatty acid, saturated fatty acid, MUFA, PUFA and n3 fatty acid between the two groups.

**Conclusion:** Omega-3 fatty acids may have beneficial effects and omega-6 fatty acids may have adverse effects on the risk of amnesia. Further longitudinal studies are warranted.

**Keywords:** Transient Global Amnesia, dietary fat, fatty acids.



## INVESTIGATION THE MEDIATORY EFFECT OF MICROBIOMES ON THE RELATIONSHIP BETWEEN DIETARY PATTERNS AND OVERWEIGHT AND OBESITY

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**Background and Aim:** The prevalence of overweight and obesity has nearly tripled since 1975. Obesity is frequently linked to the onset of several metabolic disorders. Diet is a key factor in the onset of overweight and obesity. Recent studies have highlighted the crucial role of the gut microbiota (GM), the diverse community of microorganisms within the body, in mediating the impact of diet on health. The GM has emerged as a critical factor in influencing human health.

**Methods:** Recently, the gut microbiota (GM) has garnered attention that influencing the interactions between external factors and host metabolism. The gastrointestinal tract is pivotal in the management of obesity. GM play a role in enhancing the host's metabolism, immune response, and overall physiological health by generating biologically active substances. The potential exists for microbiome-centered interventions, encompassing probiotics, prebiotics, and dietary pattern to exert influence over obesity risk. Furthermore, interventions, including fecal microbiota transplantation (FMT), have proven effective in correcting GM and restoring beneficial metabolic outcomes. FMT is an emerging technology with promising potential to improve clinical results in various pathological conditions such as obesity by modifying GM composition.

**Conclusion:** In conclusion, consistent research suggests that adopting healthier dietary patterns, assessed through various indices, is associated with a lower risk of obesity, mediated by the GM. Tailored dietary recommendations based on individual GM composition hold promise for preventing and managing obesity. These findings underscore the microbiome's role in promoting health through dietary choices and emphasize the importance of dietary patterns in obesity management.

**Keywords:** Microbiomes; Dietary patterns; Obesity.





## THE RELATIONSHIP BETWEEN SELENIUM INTAKE AND HEPATIC STEATOSIS INDEX IN HEALTHY INDIVIDUALS AND NON-ALCOHOLIC FATTY LIVER DISEASE: A CASE-CONTROL STUDY

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**Background and Aim:** Selenium is a rare mineral that is needed by the human body. Selenium has a very narrow and limited dietary range, too little can lead to anemia, and too much can lead to acidosis. Recent findings from observational studies and clinical trials have raised concerns about exposure to high levels of selenium due to potential health problems, including dyslipidemia, type 2 diabetes, or insulin resistance.

**Methods:** This case-control study was conducted on 356 men and women over 18 years in Tehran. 39 of the participants were in the case group and 317 of the participants were in the control group. Laboratory data, including alanine aminotransferase (ALT) and aspartate aminotransferase (AST), and anthropometric data such as height and weight were recorded based on the reports of the study participants, and the Hepatic steatosis index (HSI) was calculated. Dietary intakes were assessed using a 147-item food frequency questionnaire. The shortened version of the Physical Activity Questionnaire (IPAQ) was used to assess physical activity.

**Results:** The average intake of selenium among the tertiles of the lifeline diet score of healthy people has decreased significantly ( $P$ -value=0.021). Also, the average intake of selenium in the control group ( $105.95 \pm 43.38$ mg) was significantly lower than the case group ( $127.91 \pm 56.28$ mg) ( $P$ -value=0.004). The data obtained in the two study groups were analyzed using the SPSS 26 version.

**Conclusion:** Our findings indicate that the average intake of selenium among the tertiles of the lifeline diet score of healthy people has decreased and more selenium intake increases the chance of developing non-alcoholic fatty liver disease.

**Keywords:** Non-alcoholic fatty liver; selenium; Hepatic Steatosis Index



## ROYAL JELLY'S EFFECT ON BIOMARKERS RELATED TO COVID-19

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Royal jelly is a gel-like substance that is consumed by queen bees and is known as a "superfood". It contains several compounds that are believed to have health-promoting properties, including 10-hydroxy-2 decenoic acid and major royal jelly proteins. Royal jelly has been found to have beneficial effects on some disorders such as cardiovascular disease, dyslipidemia, multiple sclerosis, and diabetes. It has also been ascribed with antiviral, anti-inflammatory, antibacterial, antitumor, and immunomodulatory properties. However, there is no scientific evidence to support the use of royal jelly for COVID-19 disease. More research is needed to determine the effects of royal jelly on COVID-19 disease.

**Keywords:** Royal jelly, covid 19, super food



## HEALTH RELATED QUALITY OF LIFE AND WEIGHT SELF-EFFICACY OF LIFE STYLE AMONG NORMAL-WEIGHT, OVERWEIGHT AND OBESE IRANIAN ADOLESCENTS: A CASE CONTROL STUDY

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**Background and Aim:** Identifying and investigating the factors influencing self-efficacy and eventually health related quality of life (HRQoL) can be an important step toward the prevention and treatment of the obesity. The aim of the study was to compare weight self-efficacy and HRQoL among normal-weight, overweight and obese Iranian adolescents.

**Methods:** In this case-control study, 118 obese and overweight adolescents (case group) and 118 adolescents with normal weight (control group) were recruited. Adolescent's anthropometric characteristics were measured. The Weight Efficacy Lifestyle Questionnaire (WEL), pediatric quality of life inventory (PedsQLTM 4.0) and self-reported physical activity were completed by the adolescents.

**Results:** Multivariate logistic regression adjusting for various confounders indicated that overweight and obese adolescents were less likely to be physically active (adjusted odds ratio, AOR= 0.66; 95% confidence interval [CI], 0.48 to 0.911), had lower ability to cope with social pressure (AOR= 0.54; 95% CI, 0.32 to 0.93), involved in less positive activities (AOR= 0.53; 95% CI, 0.37 to 0.75), and felt more negative emotions (AOR= 0.23; 95% CI, 0.14 to 0.36) than their normal-weight counterparts. Moreover, obese and overweight adolescents were more likely to report deteriorated quality of life in all PedsQL subscales than those with normal weight ( $P<0.05$ ). The results of the mediation analysis indicated that negative emotions mediated the relationship between adolescents' weight status and HRQoL ( $Z = -5.79$ ,  $P<0.001$ ).

**Conclusion:** Weight management programs should focus on increasing adolescent's control on situations related to negative emotions to improve their HRQoL.

**Keywords:** Adolescent, Emotions, Obesity, Quality of life Self-efficacy



## INVESTIGATING THE EFFECT OF PROBIOTICS CONSUMPTION ON STRESS LEVELS

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**Background and Aim:** Stress is a state of worryment or mental tension caused by a difficult situation, which today about 60% of people in our society suffer from. Stress affects both our mind and body and can cause premature aging, disturbance of the balance of gut microbiota, heart problems, tooth and gum damage, weight gain and many other problems. Considering the increase in the use of probiotic food products and supplements among people and the impact of these products on the gut microbiota and various health factors, in this study we investigated the effect of probiotics consumption on the level of stress.

**Methods:** This study is a review study written in 2023. By searching international and national databases, articles were collected from 2017 to 2023 about the effect of probiotics consumption on stress. After reviewing the search results, finally 25 articles were used to write this study.

**Results:** Probiotics can increase or decrease the synthesis of some neurotransmitters and biologically active factors such as serotonin, brain-derived neurotrophic factor, and cortisol, and reduce stress by modulating the nerve potential of gut microbiota.

**Conclusion:** Based on the current findings, the consumption of probiotic products reduces the amount of stress. Therefore, a diet containing these products is recommended to people. However, to better understand this mechanism, experiments on larger scales are needed.

**Keywords:** probiotic;stress;nerve potential



## THE EFFECT OF OMEGA-3 FATTY ACIDS ON APPETITE: RCT

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**Background and Aim:** controlling mechanisms of appetite and food intake is an important issue for a variety of different types of athletes. Previous studies showed omega-3 fatty acid increased appetite in patients, but results in healthy individuals are inconclusive.

**Methods:** This study assessed the effect of omega-3 fatty acid supplements on food intake and appetite in young male athletes with normal body fat percentages. In a three-week double-blind placebo-controlled RCT in Tabriz, Iran (2019), 72 male athletes, age 22.2 ( $\pm 2.5$ ) y with 13.9 (8.5) body fat percent were randomized to either an omega-3 (2000 mg/day; EPA: 360 mg, DHA:240 mg) or placebo (2000 mg/day paraffin) group. 3-day food diaries were completed before and after the intervention. Body composition was measured by bioelectrical impedance analysis. Appetite was assessed by visual analog scale (VAS) before and after each week of intervention.

**Results:** Results showed carbohydrate intake increased in the omega-3 group (MD = 65.8 g; 95% CI = 9.1, 70.1; P = 0.03). VAS score for satiety decreased. Hunger sensation, desire to eat, and desire to eat sweet foods increased in each of the three weeks.

**Conclusion:** omega-3 supplementation increased appetite in athletes without significant change in body fat percentage.

**Keywords:** Omega-3 supplementation, Appetite, Food intake, Body Composition



## THE EFFECT OF FEEDING METHODS USED BY MOTHER, ON HEIGHT AND WEIGHT OF CHILDREN

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**Background and Aim:** Unhealthy diet during childhood has a lot of health adverse effects during other periods of life. The aim of this study was to evaluate the effect of mothers' feeding methods on the height and weight of children aged 6-8 years.

**Methods:** In this cross-sectional study, 287 children aged 6-8 years, were carried out from nine primary schools at Ahvaz city, in 2017. After completing the comprehensive child nutrition inventory (CFPQ) questionnaire by mothers, the score of each feeding method was determined and based on the scores, children were divided into three using levels (Low, mediate and high) of feeding methods, and then their weight and height were compered between three levels of feeding method.

**Results:** Weight and height were significantly lower in a group of children who had high freedom to choose food)  $p=0.026$ ,  $p=0.016$  respectively). Also, in groups that mothers used moderate and high levels of childhood emotion regulation with food, the weight of children was significantly lower ( $p=0.049$ ). The moderate level of methods such as encouraging for balance and diversity, child participation in meal planning and controlling the available foods had not a relationship with the weight of children.

**Conclusion:** High level of freedom for meal choosing by children and controlling the emotions of a child with foods may lead to inappropriate food choosing and food intake so cause less growth indicates and weight of the child compared to peers.

**Keywords:** Feeding behavior, Healthy diet, Child, Growth



## FOOD INSECURITY IS ASSOCIATED WITH THE SLEEP QUALITY AND QUANTITY IN ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** We evaluated associations between food insecurity (FI) and the quality and quantity of sleep in adults ( $\geq 18$  years).

**Methods:** The current study represented a systematic review and meta-analysis of observational studies. Databases of PubMed, Scopus, Embase and Web of Science were searched from inception until 6 June 2022. Meta-analyses were conducted using random-effects models, and effect sizes were reported as OR and 95 % CI. Data from ten eligible observational studies, including 83 764 participants, were included. FI was associated with an increased risk of poor sleep quality (OR = 1.45; 95 % CI (1.24, 1.70),  $I^2 = 95$ ,  $P < 0.001$ ,  $n = 7$ ). Besides, subgroup analysis showed increased risk of poor sleep quality corresponding to the severity of FI across mild (OR = 1.31; 95 % CI (1.16, 1.48),  $I^2 = 0$  %,  $P < 0.001$ ,  $n = 5$ ), moderate (OR = 1.49; 95 % CI (1.32, 1.68),  $I^2 = 0$  %,  $P < 0.001$ ,  $n = 5$ ) and severe (OR = 1.89; 95 % CI (1.63, 2.20),  $I^2 = 0$  %,  $P < 0.001$ ,  $n = 5$ ) levels. Similarly, subgroup analysis by sleep problems showed that FI was associated with an increased the risk of trouble falling asleep (OR = 1.39; 95 % CI (1.05, 1.83),  $I^2 = 91$  %,  $P = 0.002$ ,  $n = 3$ ) and trouble staying asleep (OR = 1.91; 95 % CI (1.37, 2.67),  $I^2 = 89$  %,  $P < 0.001$ ,  $n = 3$ ). Moreover, FI was associated with the odds of shorter (OR = 1.14; 95 % CI (1.07, 1.21),  $I^2 = 0$  %,  $P < 0.001$ ,  $n = 4$ ) and longer sleep duration (OR = 1.14; 95 % CI (1.03, 1.26),  $I^2 = 0$  %,  $P = 0.010$ ,  $n = 4$ ).

**Conclusion:** Collective evidence supports that FI is associated with poor sleep quality and quantity in adults. Preventative and management strategies that address FI may provide health benefits beyond improving nutritional status per se.

**Keywords:** Food insecurity, Sleep, Meta-analysis, Systematic review



## THE COMPARISON OF FOOD PATTERNS AND FOOD EXPENDITURES BASED ON SOCIOECONOMIC STATUS IN IRANIAN HOUSEHOLDS

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**Background and Aim:** Household income levels, food prices, and the amount of money spent on food are important factors that affect food choices and people health. Our aim was to assess the effect of food prices and individuals' income levels on the food patterns of Iranian households with different socioeconomic statuses.

**Methods:** Method: 621 households were randomly selected from five Kermanshah city districts based on their SES. Data were collected using a personal information questionnaire, SES questionnaire, semi-quantitative weekly food purchase registration questionnaire, outdoor food purchase registration questionnaire, and medium- and long-term food purchase reminder questionnaires. Results: The average daily total food cost for households was  $2.51 \pm 0.18$  \$. The highest and lowest daily food expenditures were related to the protein (39.9%) and the dairy groups (3.8%). Households in the first SES spent 75.2% of their total income on food, and there was a direct and significant correlation between SES, education, and income level with energy, macronutrients, and fiber ( $p < 0.001$ ).

**Conclusion:** Our findings show that SES can influence the amount and type of nutrients purchased by households. Increasing nutritional knowledge and appropriate decision-making by food policymakers may improve the quality of household diets at the community level.

**Keywords:** social inequalities, food pattern, socioeconomic status, household income, macronutrients





## IN THE SHADOWS OF INSECURITY: A SYSTEMATIC EXPLORATION OF THE NEXUS BETWEEN FOOD SECURITY AND MENTAL HEALTH

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**Background and Aim:** This systematic review delves into the intricate and often overlooked relationship between food security and mental health. Recognizing that food security extends beyond mere sustenance, the study aims to comprehensively investigate the reciprocal impact of these phenomena, shedding light on their interconnected dynamics and exploring potential avenues for intervention.

**Methods:** Employing a systematic approach, we conducted an extensive search across diverse databases, including PubMed, Science Direct, and Scopus. The search strategy focused on identifying studies that illuminate the complex interplay between food security and mental health.

**Results:** Across the selected studies, a compelling narrative emerges, revealing a profound and bidirectional relationship between food security and mental health. Individuals experiencing food insecurity are found to be more vulnerable to mental health challenges, including heightened stress, anxiety, and depressive symptoms. Conversely, mental health conditions can exacerbate or contribute to the risk of food insecurity through various pathways, impacting dietary behaviors and economic stability. The synthesis of evidence underscores the critical need for holistic interventions that address both food security and mental health simultaneously. Recognizing these intertwined challenges provides an opportunity to develop innovative strategies that not only alleviate food insecurity but also promote mental well-being, fostering a more resilient and nourished population.

**Conclusion:** This systematic review highlights the often-overlooked intersection of food security and mental health, revealing a complex interdependence. The findings emphasize the importance of integrated policies and interventions that simultaneously target food security and mental health, ultimately contributing to improved overall health outcomes.

**Keywords:** Food Insecurity. Mental Health. Interconnected Challenges.



## ASSOCIATION OF HOUSEHOLD FOOD INSECURITY WITH NUTRITIONAL STATUS OF YOUTH, NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) 2017–2018

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**Background and Aim:** Food insecurity has significant impact on the health and development of youth. The aim of this study was to determine the prevalence of household food insecurity (HFI) based on sociodemographic factors, and to examine its association with the nutritional status of youth.

**Methods:** The present study employed data from the 2017-2018 National Health and Nutrition Examination Survey (NHANES). The analysis encompassed a total of 1,697 youth aged between 6 and 17 years. Body mass index was calculated as weight/height<sup>2</sup> (kg/m<sup>2</sup>) and the criteria of the 2000 CDC growth charts were used for determining conditions of overweight and obesity. Food security status was measured by 18-item questionnaire developed by the U.S. Department of Agriculture (USDA). Logistic regression was used to determine the association between the variables.

**Results:** Overall, 27.4% of participants were food insecure. The concentration of vitamin D and HDL cholesterol in youths from families experiencing food insecurity was notably lower compared to those from food secure households ( $p < 0.05$ ). Adjusted analysis confirmed that HFI was associated with risk of overweight and obesity (aOR 1.76, 95% CI 1.25 to 2.46; aOR 1.59, 95% CI 1.19 to 2.13, respectively).

**Conclusion:** The presence of food insecurity within households has been linked to a higher probability of youth becoming overweight or obese. Our findings strongly indicate the requirement for safeguarding measures to identify vulnerable households in their initial stages, thereby preventing the adverse impact of malnutrition on young individuals.

**Keywords:** youth, Food security, Obesity, NHANES



## EFFECT OF LOW CALORIE DIET PLUS GREEN CARDAMOM ON EXPRESSION OF INVOLVED GENES IN FAT METABOLISM AMONG OBESE WOMEN WITH POLYCYSTIC OVARY SYNDROME; A DOUBLE BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** As the most common endocrine disorder, polycystic ovary syndrome (PCOS) affects approximately 27% of women of reproductive age. PCOS is one of the main causes of infertility related to obesity and metabolic disorders. In this situation, nutritional interventions seem to help by improving weight and metabolic status. Hence, we considered the present study with aim of the effect of low-calorie diet with green cardamom on the expression of genes involved in fat metabolism in obese women with PCOS.

**Methods:** This double blind randomized controlled trial was conducted on PCOS women referring to gynecology and female infertility clinics, Kermanshah city, west of Iran, in 2021. 194 women were selected randomly with inclusion criteria: women aged 18-45 years with body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup> in which PCOS are diagnosed according to Rotterdam criteria. These women were randomly divided two groups and were matched to controlled confounding factors (demographic data, socioeconomic status, physical activity, dietary intake, and anthropometric indices): intervention (n= 99; 3 g/day green cardamom) and control groups (n=95; placebo tablets for considering blind method). Both studied groups were given low calorie diet due to ethical consideration. Peroxisome proliferative activating Receptor-  $\gamma$  (PPAR- $\gamma$ ), Carnitine Palmitoyltransferase 1A (CPT1A), and Acetyl-CoA Carboxylase Beta (ACAB) genes expression in each group were assessed by reverse transcription-polymerase chain reaction (RT-PCR) method before and after 16 weeks' intervention, anthropometric and androgen hormones, as well. Differences between 2 studied groups and within groups were assessed using independent samples t-test and paired samples t-test, respectively.

**Conclusion:** The mean age in the intervention and placebo groups was  $32.99 \pm 5.57$



## The 4<sup>th</sup> International & 16<sup>th</sup> Iranian Nutrition Congress

and  $33.81 \pm 5.42$  years ( $P=0.073$ ). The mean change of BMI  $2.6 \pm 1.9$  and  $2.3 \pm 2.27$  kg/m<sup>2</sup> were significantly decreased after intervention in both two studied groups ( $P<0.001$ ). Androgen hormones were significantly improved in the intervention group compared to the control group ( $P<0.001$ ). The expression level of CPT1A was significantly down-regulated compared to control group ( $P<0.001$ ), as well as, PPAR- $\gamma$  was significantly up-regulated in the intervention group after intervention with green cardamom compared to control group ( $P<0.001$ ). We did not observe any change in the expression levels of ACAB ( $P=0.482$ ). This current study showed that the administration of low calorie diet plus green cardamom is a beneficial approach for improving - anthropometric, androgen hormones, as well as- the expression of genes involved in fat metabolism in PCOS women under the low- calorie diet. **Keywords:** Polycystic ovary syndrome; green cardamom; gene expression; low calorie diet



## INVESTIGATING THE ROLE OF ZINC MICRONUTRIENT ON THE PREVENTION OF PROSTATE CANCER

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**Background and Aim:** Prostate cancer is the 2nd most commonly occurring cancer in men. One of the factors that are believed to play a role in cancer is nutrition. In the present study, we investigated the role of zinc micronutrient consumption in the prevention of prostate cancer.

**Methods:** The present study is a review study written in 2023. PubMed, Scopus, and Web of Sciences databases were used to search for relevant articles. Keywords related to this study were found using MeSH. In the first stage, a total of 60 articles were found, which was reduced to 25 articles after applying the inclusion and exclusion criteria.

**Results:** Optimum intake of zinc within the recommended range affects the prevention of prostate cancer in several ways: through the induction of A-20, it inhibits NF-kappa B, which leads to reduced angiogenesis and reduced induction of inflammatory cytokines and increased apoptosis in cancerous cells. It is effective in maintaining the proper function of the p53 gene, which is present in the nucleus of body cells and suppresses tumors and removes cancer from cells. It also reduces oxidative stress and protects DNA from reactive oxygen species and mutations.

**Conclusion:** According to the obtained results, nutrition counseling and a diet plan containing sufficient amounts of zinc such as seafood, meat, nuts, whole grains and dairy products are recommended to prevent prostate cancer. Also, due to the conflicting results about the effect of zinc on prostate cancer, it is suggested to conduct more studies in this field.

**Keywords:** Prostatic Neoplasms, Nutrition, Zinc



## INVESTIGATING THE EFFECT OF PROBIOTIC SUPPLEMENTATION ON INTESTINAL PERMEABILITY

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**Background and Aim:** Intestinal permeability describes the control of substances passing through the digestive tract through the lining cells of the intestinal wall to the rest of the body and is related to various health conditions such as inflammatory bowel diseases, autoimmunity, overweight, and food allergies. Probiotics, which have health benefits when consumed in sufficient amounts, have been considered due to their potential role in improving digestive function. The purpose of this study is to investigate the effect of probiotic supplements on intestinal permeability.

**Methods:** The present study was an evidence-based review study that was designed in 2023. By searching the international databases PubMed, Google Scholar, and Scopus, articles on the effect of probiotic supplementation on intestinal permeability were collected from 2016 to 2023. After checking the search results, finally 25 articles were used to write this study.

**Results:** Some probiotic strains, including Lactobacillus and Bifidobacterium, can strengthen the integrity of the intestinal barrier by modulating intestinal tight junction proteins, thereby reducing permeability and preventing the passage of harmful substances from the intestine into the bloodstream. In addition, these probiotics have anti-inflammatory effects and They support the production of mucus, which helps the function of the intestinal barrier. Also, by affecting the intestinal microbiota, they may indirectly affect the permeability of the intestine.

**Conclusion:** According to the results, more research is needed to clarify the specific mechanisms and optimal strains and doses of probiotics to improve intestinal permeability. In addition, factors such as individual variation and soil health conditions should also be considered in future studies.

**Keywords:** Probiotic; Intestine; Intestinal permeability



## THE EFFECT OF MELILOTUS OFFICINALIS SUPPLEMENT ON SOD1 PROTEIN GENE EXPRESSION IN THE BRAIN OF MALE ALZHEIMER'S RATS

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**Background and Aim:** As the population ages, dementia has become the third leading killer. Therefore, finding solutions to prevent, control and treat this disease is very important. Therefore, this study was conducted with the aim of investigating the effects of a Aklil-ul-Malek supplement on SOD1 gene expression in the brain tissue of male rats with Alzheimer's disease.

**Methods:** 60 male Wistar rats at the age of eight weeks were randomly divided into 3 groups: healthy control group, Alzheimer's group, Alzheimer's group with supplement. Alzheimer was induced by Trimethyltin. Aklil-ul-Malek was used as a supplement for 8 weeks with a daily dose of 300 mg/kg as an intraperitoneal injection. The rats were anesthetized with ketamine solution and xylosin and the brain and hippocampus were quickly extracted and after that, primers were prepared and gene expression of SOD1 protein was measured. The hippocampus tissue was measured by Real-Time-PCR technique and after quantifying the gene expression values using the  $2\Delta\Delta CT$  formula. One-way ANOVA test was used to estimate the differences between groups. The significance level of  $p \leq 0.05$  was considered as a decision rule to reject or accept the hypotheses.

**Results:** According to the results of one-way ANOVA, there is no significant difference between the groups in SOD1 gene expression. The results of Bonferroni's post hoc test showed that there is no significant difference between the control group and the Alzheimer's group, Alzheimer's+supplement ( $p \geq 0.05$ )

**Conclusion:** According to the results, it can be concluded that the Aklilam Mulek supplement does not have a significant effect on the expression of SOD1 genes.

**Keywords:** Alzheimer's disease, Aklil-ul-Malek, SOD1



## THE WHITE FAT BROWNING AND ANTI-OBESITY PROPERTIES OF ROYAL JELLY AND TOCOTRIENOL RICH FRACTION (TRF) IN OBESE RATS: RESULTS FROM AN EXPERIMENTAL STUDY

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**Background and Aim:** As the universal health complication obesity is rising at an alarming rate across the world. The present investigation aims to study the Royal Jelly (RJ) and a tocotrienol-rich fraction (TRF) effects in the beiging of white adipocytes, activation of brown adipocytes, and expression of thermogenic factors.

**Methods:** Obesity is induced in male Wistar rats through a prescription of a diet high in fat content. Rats were assigned into 4 arms randomly which receiving 100 mg/kg/day RJ, 85 mg/kg/day TRF, or the combinations in the following arms (n=10): HFD, RJ and HFD, TRF and HFD, RJ and TRF, and HFD in 8 weeks.

**Results:** Prescription of RJ, TRF, and both contributed to less weight gain relative to the HFD alone group (19.74± 1.58 g, 24.48 ±4.80 g, 21.48 ±6.12 respectively vs 37.04± 5.56 g). Although differences were not remarkably significant (P>0.05). RJ substantially augmented the UCP1 gene expression about 2.51 and 3.25 times higher than HFD (P<0.001). The significantly increased expression of PRDM16, CREB1, P38MAPK, and BMP8B in RJ and RJ+TRF arms was observed (P<0.001). Histological assays demonstrated beige adipocyte formation in white adipocytes and compact adipocytes in brown adipocytes of groups receiving RJ and RJ+TRF. Although TRF did not change the expressions of on studied genes

**Conclusion:** RJ prevented the substantial weight gain caused by HFD and improved markers of thermogenesis in WAT and BAT. Moreover, RJ modified the adipose tissue and might be regarded as a novel treatment approach in overfat management.

**Keywords:** Brown adipose tissue, Obesity; Royal jelly; Tocotrienol-rich fraction; thermogenesis, White adipose tissue





## CHANGES IN BODY COMPOSITION AND DIETARY PROTEIN REQUIREMENTS IN POSTMENOPAUSAL WOMEN

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**Background and Aim:** Menopause means “the permanent cessation of menstrual cycles following the loss of ovarian follicular activity”. In the post-menopausal period, the risk of metabolic diseases, osteoporosis and cardiovascular diseases increases due to physiological changes, including a decrease in estrogen levels. In the post-menopausal period, metabolic flexibility decreases and fat storage in adipose tissue increases and provides the basis for obesity and overweight.

**Methods:** This systematic review was conducted in 2023 with an advanced search in the reliable PubMed database. Keywords and Medical Subject Headings (MeSH) used include “Diet”, “Recommended Dietary Allowances”, “Body Composition”, “Menopause” and “Postmenopause”.

**Results:** After menopause, as estrogen levels decrease, lean body mass (LBM) decreases and fat mass (FM) increases. According to the longitudinal study of women’s health across the country, there is an average yearly decrease of 0.5% in LBM and 1.7% increase in FM. Protein synthesis in muscles decreases with age due to increased insulin resistance. The need for dietary protein increases in aging. In the Women’s Health Initiative study, getting more dietary protein (1.2 g/kg) improved physical performance by 32%. However, the Institute of Medicine recommends a protein intake of 0.8 grams per kilogram of body weight for all ages

**Conclusion:** In addition to the metabolic and physiological changes of aging that affect protein metabolism; Current evidence suggests that the RDA may be sufficient to maintain LBM in older women. However, more focused studies are needed to make better conclusions about determining the dietary protein requirement of postmenopausal women.

**Keywords:** Diet, Recommended Dietary Allowances, Body Composition, Postmenopause, Dietary protein intake



## INTERPLAY OF FOOD INSECURITY AND NUTRITION LITERACY: A SYSTEMATIC REVIEW

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**Background and Aim:** This systematic review addresses the intricate relationship between food insecurity and nutrition literacy within the global health context. As pervasive challenges, food insecurity significantly jeopardizes public well-being, while nutrition literacy, incorporating diverse behaviors and clinical conditions, emerges as a critical factor influencing individuals' interactions with food and fostering optimal health outcomes. This study aims to investigate the association, mediating factors, and underlying mechanisms linking food insecurity and nutrition literacy, offering insights for targeted interventions to address these pressing global health concerns.

**Methods:** A systematic search was conducted across prominent English databases, including PubMed, Scopus, and Science Direct, utilizing the keywords "food insecurity" and "nutrition literacy."

**Results:** Across the selected studies an inverse correlation is consistently observed between the severity of food insecurity and critical determinants such as dietary quality, academic performance, and mental health. Studies consistently illuminate the broader impact of food insecurity, revealing its association with compromised dietary quality. Students experiencing food insecurity are more likely to report poor health, exhibit low dietary quality characterized by insufficient consumption of fruits, vegetables, and whole grains, display disordered eating habits, and demonstrate lower academic achievements. The synthesis of these findings not only underscores the urgency of targeted interventions but also emphasizes the interconnectedness of food insecurity with broader health and educational outcomes.

**Conclusion:** This systematic review highlights a low prevalence of adequate nutrition literacy among individuals experiencing food insecurity. While nutrition literacy is influenced by social and economic factors, further research is crucial for a nuanced understanding of its relationship to dietary behavior.

**Keywords:** Food Insecurity. Nutrition Literacy. Global Health. Dietary Behavior.



## THE EFFECT OF E-MARKETING ELEMENTS ON THE HEALTHY EATING INDEX OF FOOD PRODUCTS ON IRANIAN FOOD INDUSTRY WEBSITES

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**Background and Aim:** In recent years, e-marketing (EM) has gained significant importance in the food industry. Marketing techniques have a significant impact on the amount and type of food consumed. Also, food choices are influenced by marketing strategies. This study aims to investigate the relationship between EM elements and healthy eating index (HEI).

**Methods:** This study used a valid and reliable questionnaire to evaluate the elements of the EM mix (product, price, promotion, site, customer service, and security). Eight food items (milk, ice cream, biscuits, pasta, soda, non-alcoholic beer, orange juice, chocolate, and carbonated soft drinks) from 61 food companies were assessed by a trained nutritionist based on their nutritional value charts. The HEI was calculated based on adherence to the food guide pyramid. The collected data were analyzed using relevant statistical methods in STATA.  $p < 0.05$  was considered significant.

**Results:** The linear regression revealed a positive correlation between HEI and the 'product' element from the EM mix (Pearson  $r = 0.77$ ,  $P < .05$ ), which includes packaging, appearance, and trademark. The mean HEI was  $33.75 \pm 14.31$  (95% CI: 13.42-54.08). No significant correlation was observed for price, promotion, site, consumer service, personalization, and security with HEI status.

**Conclusion:** The study highlights the importance of considering health aspects when designing product packaging, appearance, and trademarks in the food industry's online marketing strategies.

**Keywords:** E-marketing mix, HEI, food industry



## EFFECT OF COLOSTRUM ON THE IMMUNE SYSTEM IN ATHLETES; A SYSTEMATIC REVIEW

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**Background and Aim:** Athletes constantly seek ways to enhance performance and protect themselves from the long-term effects of exercise. One promising solution is colostrum supplementation. This study aims to investigate the impact of Bovine colostrum on the immune system in athletes.

**Methods:** A systematic review was conducted on four databases (PubMed, Embase, Google Scholar, Scopus, and Web of Science) from inception until November 2023. Twenty-one controlled trials, following the Cochrane protocol, were included to examine the effects of Bovine colostrum on the immune system in athletes.

**Results:** The findings of the studies indicate that daily consumption of 3.2 grams of colostrum for 24 weeks can decrease the production of inflammatory cytokines caused by exercise and increase anti-inflammatory cytokines. Additionally, a daily intake of 20 grams of colostrum supplement can protect against the reduction of neutrophil function and immune responses resulting from long-term exercise. The group receiving colostrum experienced fewer upper respiratory tract diseases compared to the placebo group in studies that investigated this indicator. No significant effects on leukocyte count were observed with any dosage of supplementation, and the results of studies on other immune indicators were inconsistent.

**Conclusion:** Bovine colostrum can improve athletes' immune system performance by regulating immune parameters and mitigating the negative effects brought about by intense exercise. However, the contradictory results of existing studies call for further research that examines different doses of colostrum in various sports. Further research is recommended to be conducted in the future regarding this matter.

**Keywords:** immune system, inflammation, athletes, Bovine colostrum



## EFFECTS OF HEMP SEED ALONE AND COMBINED WITH AEROBIC EXERCISE ON METABOLIC PARAMETERS, OXIDATIVE STRESS, AND NEUROTROPHIC FACTORS IN YOUNG SEDENTARY MEN

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**Background and Aim:** Hemp seed and physical activity (PA) have many benefits for the metabolic and brain health of the body. This study investigated the effects of hemp seed alone and aerobic exercise on metabolic markers, oxidative stress, and neurotrophic factors in young sedentary men.

**Methods:** This double-blind, placebo-controlled, randomized clinical trial was conducted on 48 sedentary young men in Tabriz, Iran, from April to August. The researcher in this study randomized all participants into four groups, including (1) hemp seed, (2) hemp seed + PA, (3) PA + placebo, and (4) placebo. Hemp seed supplement was administered in two 1-g capsules daily, and aerobic PA was performed a week thrice.

**Results:** Aerobic PA with hemp seed consumption caused a significant difference in weight, body mass index, fat mass, high-density lipoprotein, catalase, and BDNF compared with baseline. Also, aerobic PA alone caused significant changes in body weight, fat mass, and triglyceride compared with baseline. Consumption of hemp seeds alone caused a significant increase in high-density lipoprotein levels compared with baseline. At the end of the study, fat mass, total cholesterol, low-density lipoproteins, and BDNF were significantly different between the groups.

**Conclusion:** According to our results, aerobic PA combined with hemp seed consumption improved anthropometric indices, lipid profile, and brain-derived neurotrophic factor among young sedentary men.

**Keywords:** hemp seed; aerobic exercise; BDNF; NPY



## INVESTIGATING THE RELATIONSHIP BETWEEN SUPPLEMENTATION WITH SPINACH-DERIVED THYLAKOID AND HIGH INTENSITY TRAINING ON INSULIN RESISTANCE IN MALES WITH OBESITY

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**Background and Aim:** This study aimed to evaluate the effects of a 12-week intervention involving high-intensity functional training (HIFT) combined with thylakoids derived from spinach on insulin resistance in males with obesity.

**Methods:** A total of 68 participants were randomly divided equally into four groups: Control, Supplement, Training, and Training + Supplement. Following baseline measurements, the two training groups underwent 12 weeks of exercise training (3 sessions/week). The intervention consisted of a 12-week HIFT program utilizing the CrossFit program, comprising 36 sessions lasting up to 60 minutes each. Participants were divided into two subgroups: one received 5 g/day of thylakoid-rich spinach extract, while the other received a placebo of 5 g/day of raw corn starch. The supplementation was taken 30 minutes before lunch throughout the entire 12-week duration. Baseline assessments were obtained 48 hours before the start of the training protocols and 48 hours after the last training session in all groups.

**Results:** Plasma levels of semaphorin3c were significantly correlated ( $p < 0.05$ ) with BMI ( $r = 0.43$ ), body weight ( $r = 0.57$ ), FAT ( $r = 0.768$ ), FFM ( $r = -0.612$ ), glucose ( $r = 0.623$ ), insulin ( $r = 0.756$ ) and HOMA-IR ( $r = 0.727$ ). There were also significant group differences in insulin (ES: 0.77), glucose (ES: 0.21), and HOM-IR (ES: 0.44) ( $p < 0.05$ ).

**Conclusion:** This research provides valuable insights into the beneficial effects of combining thylakoid supplementation from spinach with HIFT in addressing obesity among males. The findings suggest that non-pharmaceutical approaches, such as thylakoid supplementation alongside HIFT, have the potential to contribute to improved glucose regulation and body composition factors.

**Keywords:** Functional training; Insulin resistance; Obese men; Supplementation



## THE ASSOCIATION BETWEEN DIETARY ACID LOAD AND BODY COMPOSITION IN THE PHYSICAL EDUCATION STUDENTS AGED 18-25 YEARS OLD

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**Background and Aim:** To find the association between dietary acid load (DAL) and body composition in the physical education students.

**Methods:** This study was carried out on 207 students of both genders aged 18-25 years old. DAL was calculated based on potential renal acid load (PRAL) and net endogenous acid production (NEAP) methods. Anthropometric indices were measured. Bioelectric impedance was used to assess body composition and other related items.

**Results:** The mean score of NEAP and PRAL were  $80.18 \pm 31.30$  and  $33.94 \pm 22.11$ , respectively. The mean weight and fat mass of subjects were  $64.05 \pm 9.72$  kg and  $20.28 \pm 0.67$  kg, respectively. Participants in the highest tertile of PRAL had a higher weight ( $64.56 \pm 1.14$  kg) in comparison to participants in the lowest tertile ( $61.65 \pm 1.19$  kg) ( $P=0.027$ ). After adjusting for confounders, a significant positive association was found between NEAP score and hip circumference ( $\beta=0.206$ ,  $P=0.039$ ), body mass index ( $\beta=0.214$ ,  $P=0.031$ ), fat mass ( $\beta=0.218$ ,  $P=0.001$ ), and body adiposity index ( $\beta=0.182$ ,  $P=0.037$ ). Furthermore, a statistically significant negative association was observed between total body water and NEAP score ( $\beta=-0.217$ ,  $P=0.001$ ) and the percentage of fat-free mass and NEAP ( $\beta=-0.229$ ,  $P=0.001$ ).

**Conclusion:** Individuals with a higher DAL score may have a higher weight, fat mass and hip circumference and a lower fat-free mass. In addition, there might be an association between DAL and obesity.

**Keywords:** Dietary acid load; body composition, body mass index; waist circumference; fat-free mass; muscle mass; body fat



## EFFECT OF KETOGENIC DIET ON SPORTING PERFORMANCE IN ATHLETICS

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**Background and Aim:** Recently, there has been a focus on evaluating the beneficial effect of adhering to a ketogenic diet to increase the performance of athletes from different sporting disciplines. As the available research is yet to be collected in a single review, this review aims to conclude from the existing literature on the impact of a ketogenic diet among athletic populations.

**Methods:** We conducted a non-systematic review of English literature using various databases including Scopus, EMBASE, Web of Science, and PubMed.

**Results:** The outcomes of a ketogenic diet and athletic performance seem to be inconclusive and influenced by the type of sport. The existing knowledge shows no clear performance benefit for athletes following a ketogenic diet, with some benefit mainly shown in short-duration, vigorous-intensity tests, when weight loss was likely a confounding variable. While many trials showed no performance benefit, it is important to note that a ketogenic diet often did not cause a performance decrement, particularly in recreationally trained athletes. Moderate-to-vigorous exercise at a KD shows no decline after adaptation. Trained endurance athletes experience reduced exercise economy at  $>70\%$   $VO_{2max}$ , which could hinder performance in real-world scenarios.

**Conclusion:** The findings of this review show that there are positive and negative effects linked to following a ketogenic diet among athletic populations.

**Keywords:** Athletics, Performance, Ketogenic diet





## CHALLENGES WITH THE USE OF POSTBIOTICS IN FOODS

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**Background and Aim:** The use of compounds known as “biotics,” including probiotics and prebiotics, has a long history in food. In recent years, a new class of beneficial compounds known as postbiotics has emerged and found applications in various sectors, including food, agriculture, medicine, and veterinary science. Postbiotics comprise metabolic byproducts and cell wall components of beneficial bacteria, particularly *Lactobacillus*, *Lactococcus*, *Bifidobacterium*, *Bacillus*, and *Saccharomyces* strains.

**Methods:** Postbiotics are used in the production of functional foods, food preservation packaging. The use of postbiotics in foods, rather than live probiotics, offers several advantages, including resilience to environmental factors during production, transportation, and storage, and the elimination of antibiotic resistance gene transfer. Additionally, postbiotics stand out in the emerging field of food additives and supplements for dietary, medical, and nutritional applications owing to their diverse biological compounds exhibiting remarkable properties, such as immune system modulation, antimicrobial, antioxidant, prebiotic and anti-cancer activities, etc. Despite the many advantages, the use of postbiotics in food faces several challenges. The most important challenge is the ambiguity in the definition and lack of precise knowledge of the type and amount of biological compounds. Other challenges include changes in the color, texture, and sensory properties of food, the presence of high levels of proteolytic and lipolytic enzymes, the lack of safety and regulatory standards for the production, marketing, and labeling of postbiotics, and the difficulty in determination the amount and composition of postbiotics.

**Conclusion:** This review will discuss these challenges briefly and the research that has been done to address these drawbacks.

**Keywords:** Postbiotics, Parabiotics, Functional Food, Packaging, Food Preservation, Lactic Acid Bacteria



## THE EFFECT OF THE BODY CONTOURING MICROWAVE PLATFORM ON LIPID PROFILE, FBS, AND LEPTIN HORMONE; A CLINICAL TRIAL

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**Background and Aim:** The present study aimed to evaluate the effects of microwave technology on lipid profile, Fasting blood glucose (FBS), and leptin hormone of overweight adults.

**Methods:** This trial was conducted on 30 overweight adults who referred to Behbood Clinic in Tehran based on inclusion and exclusion criteria. The participants were exposed to microwave technology (radiofrequency: 2.5 GHz) based on a standard treatment protocol at two intervals (0, 10, and 20 days). Trunk fat, PBF, SSM, fat thickness, BFM, cholesterol, glucose, triglyceride, HDL-c, LDL-c, insulin, and leptin, were measured at the beginning, day 10, and 20 days after the study. In addition, three-day dietary records were collected.

**Results:** The mean age of the participants was  $34.9 \pm 7$  years and 71% of participants were female. The findings of the study showed that the use of RF technique can reduce the level of cholesterol and HDL during 20 days and also significantly reduce the levels of leptin hormone. It was also shown that RF has no significant effect on glucose, triglyceride, LDL, and insulin levels during three time point intervention. Furthermore, in present study microwave technology/radiofrequency significantly reduced trunk fat, PBF, SSM, fat thickness, and BFM after 20 days intervention.

**Conclusion:** ONDA treatment after 40 days intervention lead to decrease in serum triglyceride, HDL and leptin levels, although it had no significant effect on other factors including blood glucose, insulin and other lipoproteins. More well-designed studies are required to clarify this topic and prove these effects.

**Keywords:** microwave technology, radiofrequency, overweight, Leptin, lipid profile



## APPLICATION OF ARTIFICIAL INTELLIGENCE IN NEW FOOD DEVELOPMENT

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**Background and Aim:** Artificial intelligence (AI) has embodied the recent technology in the food industry over the past few decades due to the rising of food demands in line with the increasing of the world population. The capability of the said intelligent systems in various tasks such as food quality determination, control tools, classification of food, and prediction purposes has intensified their demand in the food industry.

**Methods:** Expert system, fuzzy logic, ANN, adaptive neuro-fuzzy inference system (ANFIS), and machine learning are among the popular techniques that have been utilized in the food industries.

**Results:** Those diverse applications in comparing their advantages, limitations, and formulations as a guideline for selecting the most appropriate methods in enhancing future AI- and food industry-related developments.

**Conclusion:** Furthermore, the integration of this system with other devices such as electronic nose, electronic tongue, computer vision system, and near infrared spectroscopy (NIR) is also emphasized, all of which will benefit both the industry players and consumers.

**Keywords:** Artificial Intelligence, Food Development, NPD, AI



## ACUTE OR SHORT-TERM EFFECTS OF WHEY PROTEIN ALONE OR TOGETHER WITH CARBOHYDRATE ON INFLAMMATORY STATUS: A SYSTEMATIC REVIEW OF CLINICAL TRIALS

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**Background and Aim:** Excessive inflammatory response is associated with many diseases. Recently, there has been an increasing trend for investigation of the acute or short-term effects of whey protein alone or in combination with carbohydrates on inflammation, especially in athletes. This systematic review aimed to clarify these effects.

**Methods:** PubMed, Scopus, and Web of Science databases were searched from January 1990 to September 2021, without language restriction. Those studies examining the effects of whey protein alone or together with carbohydrates on interleukin-6, tumor necrosis factor-alpha, and C-reactive protein levels with a maximum duration of 15 days and with at least one comparison group were included. The quality of studies was analyzed using the Cochrane risk of bias tool.

**Results:** Twenty-five studies met the inclusion criteria. Significant reductions in inflammatory markers was observed in seven out of 25 studies (28%). However, one out of 25 studies (4%) reported a significant increase in inflammatory status. Among those studies comparing the effects of whey protein alone with non-protein or protein-containing groups, 18.18% (two out of 11) and 10% (one out of ten) of the trials revealed a significant decrease in the markers, respectively. Of those studies comparing whey protein plus carbohydrate with non-protein or protein-containing groups, 33.33% and 40% of them showed a significant reduction in the inflammatory response, respectively. The quality of the majority of studies (84%) was poor.

**Conclusion:** It seems that whey protein alone or the combination of it with carbohydrates may not affect the inflammatory markers in the short run.

**Keywords:** Inflammation; Whey proteins; Carbohydrates; Acute



## ARTIFICIAL INTELLIGENCE-BASED APPROACHES TO ASSESS DIETARY PATTERNS: A SYSTEMATIC REVIEW

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**Background and Aim:** The development of artificial intelligence has provided new opportunities for research in the field of nutrition science. This article was done to review and comprehensively examine studies related to the field of diet and food patterns that have used artificial intelligence techniques and machine learning algorithms.

**Methods:** All studies published until June 2023 were searched using PubMed Cochrane, EMBASE, and SCOPUS databases and with related keywords. No time and language restrictions were applied during the search.

**Results:** After a complete review of the articles, 31 relevant articles were selected that were consistent with the purpose of the present study. Different machine learning methods have different accuracy in predicting food patterns. For example, the intelligent neural network is more accurate in predicting healthy food index quintiles, while it is more accurate in decision tree meals. Another application of machine learning is extracting food patterns and investigating their relationship with various diseases such as obesity, heart disease, stroke, risk of death from cardiovascular disease and cancer. Also, some machine learning methods, such as decision trees, can provide models for predicting adherence to different diets, such as the Mediterranean diet.

**Conclusion:** The most important algorithms in the study of food patterns are decision trees, random forest, K-means, K-nearest neighbors, regression methods, support vector machines and intelligent neural network. These methods can help to better understand dietary patterns associated with chronic diseases by categorizing and finding hidden associations between groups and foods. More studies are needed in this area to better understand these connections.

**Keywords:** artificial intelligence, machine learning, nutrition, food pattern



## THE EFFECT OF CONJUGATED LINOLEIC ACID SUPPLEMENTATION ON CIRCULATING ADIPONECTIN LEVELS: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** The results of human clinical trials examining the effects of conjugated linoleic acid (CLA) on adiponectin concentration are inconsistent. Our objective was to elucidate the role of conjugated linoleic acid supplementation on adiponectin through a systematic review and a dose-response meta-analysis of available randomized placebo-controlled trials (RCTs).

**Methods:** We searched PubMed, SCOPUS, and ISI web of science up to April 2023 to identify RCTs investigating the effect of CLA supplements on plasma adiponectin concentrations. Weighted mean differences (WMDs) and their respective 95% confidence intervals (CIs) were calculated to assess the efficacy of CLA on adiponectin concentration by using random effects.

**Results:** Twelve trials with 15 treatment arms involving 804 participants were included. Pooled effect sizes did not support a significant effect of CLA in altering plasma adiponectin concentrations (WMD:  $-0.13 \mu\text{g/mL}$ , 95% CI:  $-1.02, 0.76$ ,  $p = 0.774$ ). This effect size was robust in the sensitivity analysis. In sub-group analysis, a significant reduction was observed at a CLA dose  $\geq 4 \text{ g/day}$  (WMD:  $2.26 \text{ mg/L}$ , 95% CI:  $2.05, 2.47$ ,  $p < 0.001$ ), and when used for subjects with BMI  $\geq 30 \text{ kg/m}^2$  (WMD:  $1.89 \text{ mg/L}$ , 95% CI:  $1.70$  to  $2.09$ ,  $p < 0.001$ ).

**Conclusion:** CLA supplementation may significantly increase adiponectin in dosages of  $\geq 4 \text{ g/day}$  among persons with a BMI  $\geq 30 \text{ kg/m}^2$ . Larger, well-designed trials are necessary to confirm these results.

**Keywords:** conjugated linoleic acid; adiponectin; circulating; supplementation



## PROPOLIS SUPPLEMENTATION AND LIPID PROFILE IN ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** The present systematic review and meta-analysis was conducted to investigate the efficacy of Propolis (a nutritional product from bees that has a high anti-oxidant content) intake on blood lipid profile in adults.

**Methods:** International scientific databases (PubMed, Embase, Scopus and Web of Science) were searched to detect relevant randomized controlled trials (RCTs). Random-effects model was executed to pool standardized mean differences (SMDs) and their 95 % confidence intervals (CI). Clinically relevant changes in outcomes were assessed by pooled SMD. Potential publication bias was checked by Egger test.

**Results:** Our meta-analysis comprising 298 participants did not show a statistically significant change of serum triglycerides (TG) TG (SMD = -0.07, 95 % CI = [-0.30, 0.16], P = 0.53, I<sup>2</sup> = 0.0 %), total cholesterol (TC) (SMD = 0.16, 95 % CI = [-0.48, 0.79], P = 0.62, I<sup>2</sup> = 86.3 %), high density lipoprotein cholesterol (HDL-C) (SMD = 0.23, 95 % CI = [-0.21, 0.68], P = 0.30, I<sup>2</sup> = 72.9 %) and low density lipoprotein cholesterol (LDL-C) (SMD = -0.10, 95 % CI = [-0.42, 0.22], P = 0.52, I<sup>2</sup> = 47.8 %) following Propolis intake. Mean serum lipoprotein concentrations were, however, clinically changed compared with controls. We found no evidence of publication bias.

**Conclusion:** In conclusion, although Propolis consumption does not have a statistically significant effect on lipid profile, it might contribute to clinical improvements.

**Keywords:** Propolis; Lipoproteins; Clinical trials; Meta-analysis



## THE EFFECTS OF COENZYME Q10 SUPPLEMENTATION ON LIVER ENZYMES AND ANTHROPOMETRY INDICES IN ASIAN PATIENTS WITH NON-ALCOHOLIC FATTY LIVER DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Oxidative stress is a critical factor in non-alcoholic liver disease (NAFLD) patients. On the other hand, CoQ10 could improve oxidative stress. Therefore, the aim of this systematic review and meta-analysis was summarizing the evidence on the effects of CoQ10 consumption on liver enzymes and anthropometry indices in NAFLD patients.

**Methods:** Online databases such as PubMed, Embase, Scopus, Web of Science and Cochrane Library were systematically searched to identify the randomized controlled trials (RCTs) investigating the effects of CoQ10 intake on NAFLD patients. Weighted mean difference (WMD) and 95 % confidence intervals (CIs) were pooled to reach the effects. Sensitivity analysis was ran to assess the impact each individual study on the pooled results.

**Results:** Pooled effects of three RCTs comprising 123 patients revealed a significant effect of CoQ10 supplementation on serum aspartate aminotransferase (AST) (WMD = -1.72, 95 % CIs = [-3.26, -0.18], P = 0.02, I<sup>2</sup> = 23.7 %) in compare with controls. In contrast, CoQ10 intake failed to change BMI (WMD = 0.25, 95 % CI = [-1.17, 1.69], P = 0.72, I<sup>2</sup> = 0.0 %), WC (WMD = -0.66, 95 % CI = [-3.50, 2.17], P = 0.64, I<sup>2</sup> = 0.0 %) and alanine aminotransferase (ALT) (WMD = -0.67, 95 % CI = [-7.01, 5.66], P = 0.83, I<sup>2</sup> = 61.3 %). Removing none of the trials could change the significance of the pooled effects.

**Conclusion:** The present meta-analysis concluded in the improvement of AST levels following CoQ10 intake in NAFLD patients, probably acting as a mitochondrially targeted antioxidant.

**Keywords:** Coenzyme Q10; Aminotransferase; Anthropometry; Liver; Review; Meta-analysis





## THE ASSOCIATION OF ULTRA-PROCESSED FOOD CONSUMPTION WITH ADULT MENTAL HEALTH DISORDERS: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF 260,385 PARTICIPANTS

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**Background and Aim:** We aimed to conduct a systematic review and meta-analysis of observational studies examining the relationship between ultra-processed food (UPF) consumption and the risk of mental health disorders.

**Methods:** The ISI Web of Science, PubMed/MEDLINE, and Scopus databases were searched without date restriction until 28 December 2021. Data were extracted from 26 studies, including 260,385 participants from twelve countries. Risk ratios for mental health disorders were pooled by a random-effects model. Meta-analyses suggested that UPF consumption was associated with an increased risk of depression (RR = 1.28; 95% CI: 1.19, 1.38; I<sup>2</sup> = 61.8%; p = 0.022) but not anxiety (RR = 1.35; 95% CI: 0.86, 2.11; I<sup>2</sup> = 77.8%; p = 0.198). However, when analyzed for the dietary assessment method, UPF consumption was significantly associated with an enhanced risk of depression among studies utilizing food frequency questionnaires (RR = 1.31; 95% CI: 1.21, 1.41; I<sup>2</sup> = 60.0%; p < 0.001) as opposed to other forms of dietary recall approaches. Additionally, for every 10% increase in UPF consumption per daily calorie intake, 11% higher risk of depression (RR = 1.11; 95% CI: 1.01, 1.17; I<sup>2</sup> = 88.9%; p < 0.001) was observed among adults. Dose-response analysis further emphasized a positive linear association between UPF consumption with depression risk (p-nonlinearity = 0.819, p-dose-response = p < 0.001).

**Conclusion:** Our findings indicate that UPF consumption is related to an enhanced depressive mental health status risk. There may be different causes for this increased risk, and further studies are needed to investigate if there is a causal relationship between consumption of UPF and mental health.

**Keywords:** Ultra-processed food, mental health, depression, anxiety, meta-Analysis



## ULTRA-PROCESSED FOOD CONSUMPTION AND ADULT MORTALITY RISK: A SYSTEMATIC REVIEW AND DOSE–RESPONSE META-ANALYSIS OF 207,291 PARTICIPANTS

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**Background and Aim:** We performed a systematic review and dose–response meta-analysis of observational studies assessing the association between UPF consumption and adult mortality risk.

**Methods:** A systematic search was conducted using ISI Web of Science, PubMed/MEDLINE, and Scopus electronic databases from inception to August 2021. Data were extracted from seven cohort studies (totaling 207,291 adults from four countries). Using a random-effects model, hazard ratios (HR) of pooled outcomes were estimated. Our results showed that UPF consumption was related to an enhanced risk of all-cause mortality (HR = 1.21; 95% CI: 1.13, 1.30; I<sup>2</sup> = 21.9%;  $p < 0.001$ ), cardiovascular diseases (CVDs)-cause mortality (HR = 1.50; 95% CI: 1.37, 1.63; I<sup>2</sup> = 0.0%;  $p < 0.001$ ), and heart-cause mortality (HR = 1.66; 95% CI: 1.50, 1.85; I<sup>2</sup> = 0.0%;  $p = 0.022$ ), but not cancer-cause mortality. Furthermore, our findings revealed that each 10% increase in UPF consumption in daily calorie intake was associated with a 15% higher risk of all-cause mortality (OR = 1.15; 95% CI: 1.09, 1.21; I<sup>2</sup> = 0.0%;  $p < 0.001$ ). The dose–response analysis revealed a positive linear association between UPF consumption and all-cause mortality (Pnonlinearity = 0.879, Pdose–response =  $p < 0.001$ ), CVDs-cause mortality (Pnonlinearity = 0.868, Pdose–response =  $p < 0.001$ ), and heart-cause mortality (Pnonlinearity = 0.774, Pdose–response =  $p < 0.001$ ).

**Conclusion:** It seems that higher consumption of UPF is significantly associated with an enhanced risk of adult mortality. Despite this, further experimental studies are necessary to draw a more definite conclusion.

**Keywords:** ultra-processed food; mortality risk; systematic review; dose–response



## ULTRA-PROCESSED FOOD CONSUMPTION AND ADULT DIABETES RISK: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS

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**Background and Aim:** Recent individual studies have demonstrated that consumption of ultra-processed food (UPF) may be related to type two diabetes mellitus (T2DM). We aimed to synthesize the results from these individual studies by conducting an updated systematic review and meta-analysis of observational studies evaluating the association between UPF consumption and the risk of T2DM

**Methods:** A systematic search was conducted using ISI Web of Science, PubMed/MEDLINE and Scopus electronic databases from inception up to August 2021. Data were extracted from five studies (one cross-sectional study and four cohort studies, totaling 230,526 adults from four different countries). Risk ratios (RR) of pooled results were estimated using a random-effects model. Our results revealed that higher UPF consumption was significantly associated with an increased risk of T2DM (RR = 1.74; 95% CI: 1.36, 2.22; I<sup>2</sup> = 68.9%; p < 0.001; n = 5). Linear dose-response analysis indicated that each 10% increase in UPF consumption (kcal/d) was associated with a 15% higher risk of T2DM (RR = 1.15; 95% CI: 1.06, 1.26; I<sup>2</sup> = 86.0%; p < 0.001; n = 5) among adults. Non-linear dose-response analysis demonstrated a positive linear association between UPF consumption and T2DM (pnonlinearity = 0.13, pdose-response < 0.001; n = 5) among adults.

**Conclusion:** A higher intake of UPF was significantly associated with an increased risk of T2DM. However, underlying mechanisms remain unknown and future experimental studies are warranted

**Keywords:** Ultra-processed food; diabetes risk; meta-analysis



## THE EFFECTS OF SPIRULINA SUPPLEMENTATION ON SERUM IRON AND FERRITIN, ANEMIA PARAMETERS, AND FECAL OCCULT BLOOD IN ADULTS WITH ULCERATIVE COLITIS: A RANDOMIZED, DOUBLE-BLINDED, PLACEBO-CONTROLLED TRIAL

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**Background and Aim:** The present clinical trial aimed to evaluate the efficacy of spirulina administration on serum iron, ferritin, anemia parameters, and fecal occult blood test (FOBT) in adults with ulcerative colitis (UC)

**Methods:** Eighty participants with UC were randomly assigned to take, either 1 g/day (two 500 mg capsules) spirulina (n = 40) or placebo (n = 40) in a double-blinded clinical trial for eight weeks. Dietary intake, physical activity status, serum iron and ferritin levels, anemia parameters, and FOBT were assessed in each participant at baseline and following the intervention. Seventy-three participants completed the trial. Our results indicated significantly increased (p = 0.04) serum iron after eight weeks of spirulina supplementation compared to the placebo group. The spirulina group also demonstrated significantly increased mean corpuscular volume (p = 0.004) whereas red blood cell count (p = 0.01) and hematocrit (p = 0.03) were significantly lowered in the placebo group. No significant changes in FOBT outcomes were seen between groups at baseline (p = 0.12) and the end of the trial (p = 0.34). Eight weeks of 1 g/day spirulina supplementation improved anemia parameters in adults with UC compared to placebo.

**Conclusion:** These outcomes suggest that spirulina administration may be beneficial in the management of anemia in UC. Further clinical trials of longer duration are necessary to corroborate and expand our findings

**Keywords:** spirulina, ulcerative colitis clinical trial



## EFFECTS OF COLLAGEN PEPTIDE SUPPLEMENTATION ON CARDIOVASCULAR MARKERS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED, PLACEBO-CONTROLLED TRIALS

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**Background and Aim:** Previous studies have advocated that collagen peptide supplementation (CPS) can positively affect cardiovascular health. However, the widespread impact of CPS on CVD-related markers is not fully resolved. Consequently, the current systematic review and meta-analysis aimed to assess the efficacy of CPS on CVD-related markers.

**Methods:** A systematic search in the Scopus, PubMed and ISI Web of Science databases were completed to identify relevant randomised, placebo-controlled trials (RCT) published up to November 2021. Mean Differences were pooled using a random-effects model, while publication bias, sensitivity analyses and heterogeneity were assessed using previously validated methods. Twelve RCT, comprising of a total of eleven measured markers, were selected for the quantitative analysis. Pooled data revealed that CPS significantly decreased fat mass ( $-1.21$  kg; 95 % CI:  $-2.13, -0.29$ ; I<sup>2</sup> = 0.0 %; P = 0.010) and increased fat-free mass, based on body mass percentage (1.49 %; 95 % CI: 0.57, 2.42; I<sup>2</sup> = 0.0 %; P = 0.002). Moreover, collagen peptide supplementation led to a significant decrease in serum LDL ( $-4.09$  mg/dl; 95 % CI:  $-8.13, -0.04$ ; I<sup>2</sup> = 93.4 %; P = 0.048) and systolic blood pressure (SBP) ( $-5.04$  mmHg; 95 % CI:  $-9.22, -0.85$ ; I<sup>2</sup> = 98.9 %; P = 0.018).

**Conclusion:** Our analysis also indicated that CPS did not affect glycaemic markers. Our outcomes indicate that CPS reduces fat mass, LDL and SBP while increasing fat-free mass. Future investigations with longer CPS duration are needed to expand on our results.

**Keywords:** Cardiovascular, Glycaemic markers, Body composition Health



## EFFECTS OF CAMELINA OIL SUPPLEMENTATION ON LIPID PROFILE AND GLYCEMIC CONTROL: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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**Background and Aim:** This systematic review and dose-response meta-analysis of published randomized controlled trials (RCTs) was conducted to determine the effectiveness of camelina oil supplementation (COS) on lipid profiles and glycemic indices.

**Methods:** Relevant RCTs were selected by searching the ISI Web of Science, PubMed, and Scopus databases up to July 1, 2022. RCTs with an intervention duration of less than 2 weeks, without a placebo group, and those that used COS in combination with another supplement were excluded. Weighted mean differences and 95% confidence intervals were pooled by applying a random-effects model, while validated methods examined sensitivity analyses, heterogeneity, and publication bias. Seven eligible RCTs, including 428 individuals, were selected. The pooled analysis revealed that COS significantly improved total cholesterol in studies lasting more than 8 weeks and utilizing dosages lower than 30 g/d compared to the placebo group. The results of fractional polynomial modeling indicated that there were nonlinear dose-response relations between the dose of COS and absolute mean differences in low-density cholesterol, high-density cholesterol, and total cholesterol, but not triglycerides. It appears that the greatest effect of COS oil occurs at the dosage of 20 g/day.

**Conclusion:** The present meta-analysis indicates that COS may reduce cardiovascular disease risk by improving lipid profile markers. Based on the results of this study, COS at dosages lower than 30 g/d may be a beneficial nonpharmacological strategy for lipid control. Further RCTs with longer COS durations are warranted to expand on these results.

**Keywords:** camelina oil, lipid profile, glycemic control, dose-response meta-analysis



## THE ASSOCIATION BETWEEN ULTRA-PROCESSED FOOD AND COMMON PREGNANCY ADVERSE OUTCOMES: A DOSE-RESPONSE SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Given the increasing incidence of negative outcomes during pregnancy, our research team conducted a dose-response systematic review and meta-analysis to investigate the relationship between ultra-processed foods (UPFs) consumption and common adverse pregnancy outcomes including gestational diabetes mellitus (GDM), preeclampsia (PE), preterm birth (PTB), low birth weight (LBW), and small for gestational age (SGA) infants.

**Methods:** A comprehensive search was performed using the Scopus, PubMed/MEDLINE, and ISI Web of Science databases up to December 6, 2023, without any time limitations. We pooled relative risk (RR) and 95% confidence intervals (CI) using a random-effects model. The Newcastle-Ottawa Scale, Egger's regression asymmetry test, and Begg's rank correlation test were applied to examine study quality and publication bias. Our analysis (encompassing 54 studies) revealed a significant association between UPFs intake and increased risks of GDM (RR=1.19; 95% CI: 1.10, 1.27; I<sup>2</sup>=77.5%; p<0.001; n=44), PE (RR=1.28; 95% CI: 1.03, 1.59; I<sup>2</sup>=80.0%; p=0.025; n=12), while no significant relationships were found for PTB, LBW and SGA infants. Importantly, a 100 g increment in UPFs intake was related to a 27% increase in GDM risk (RR=1.27; 95% CI: 1.07, 1.51; I<sup>2</sup>=81.0%; p=0.007; n=9). The non-linear dose-response analysis further indicated a positive, non-linear relationship between UPFs intake and GDM risk (Pnonlinearity = 0.034, Pdose-response=0.034), although no such relationship was observed for PE (Pnonlinearity = 0.696, Pdose-response=0.812).

**Conclusion:** Our results suggest that chronic, excessive consumption of UPFs may detrimentally impact pregnancy outcomes. However, further observational studies, particularly among diverse ethnic groups with precise UPFs consumption measurement tools, are imperative for a more comprehensive understanding.

**Keywords:** Ultra-processed foods, pregnancy, gestational diabetes mellitus, preeclampsia, preterm birth



## THE ASSOCIATION OF ULTRA-PROCESSED FOOD INTAKE WITH CHRONIC KIDNEY DISEASE: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF 741,654 PARTICIPANTS

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**Background and Aim:** To elucidate the potential association between ultra-processed foods (UPFs) intake and the risk of chronic kidney disease (CKD) through a comprehensive systematic review and dose-response meta-analysis.

**Methods:** A systematic search was done employing Scopus, PubMed/MEDLINE, and ISI Web of Science without any restrictions up to August 5, 2023. Relative risk (RR) and 95% confidence interval (CI) were pooled by using a random-effects model, while validated methods assessed quality and publication bias via Newcastle-Ottawa Scale, Egger's regression asymmetry, and Begg's rank correlation tests, respectively. A greater UPFs intake was significantly associated with an enhanced risk of CKD (RR=1.15; 95% CI: 1.07, 1.24; I<sup>2</sup>=70.1%; p<0.001; n=32). Subgroup analyses also suggested that a higher UPFs intake was significantly related to an increased risk of CKD in cohort studies (RR=1.18; 95% CI: 1.09, 1.27; I<sup>2</sup>=67.5%; p<0.001; n=17; vs. studies with cross-sectional design), and those using NOVA food classification (RR=1.18; 95% CI: 1.10, 1.26; I<sup>2</sup>=44.8%; p<0.001; n=7) as well as Western dietary pattern for UPF assessment (RR=1.45; 95% CI: 1.19, 1.75; I<sup>2</sup>=8.8%; p<0.001; n=5) in comparison with others. Moreover, our results revealed that greater UPFs intake was significantly associated with an enhanced risk of CKD among overweight or obese participants (RR=1.19; 95% CI: 1.07, 1.32; I<sup>2</sup>=75.8%; p<0.001; n=15) but not others. Besides, linear dose-response analysis indicated that a 1 serving/day increment in UPFs intake was related to a 5% higher risk of CKD (RR=1.05; 95% CI: 1.02, 1.09; I<sup>2</sup>=80.9%; p=0.013; n=9). The non-linear dose-response association also indicated a positive linear association between UPF intake and the risk of CKD (Pnonlinearity = 0.107, Pdose-response <0.001).

**Conclusion:** Greater intakes of UPFs were associated with an increased risk of CKD, underscoring the potential negative ramifications of chronic UPFs intake on kidney function and overall human health.

**Keywords:** Processed foods, chronic kidney disease, systematic review, meta-analysis





## SURVEY OF THE EFFECT OF EDUCATION ON KNOWLEDGE AND NUTRITIONAL BEHAVIOUR S ON PREGNAUT WOMEN REFFERED TO HEALTH CARE CUNTERS ZABOL CITY ,2018

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1.Author and presenter

2.Advisor

3.Advisor

**Background and Aim:** Background and Aim : A healthy and balanced diet is quit important in time and during pregnancy the maternal did must provide sufficient energy and nutrients to meet the mothers usual requirments ,as well as, the need of the growing fetus and enabling mother to maintain her own stores of nutrients required for fetal and enabling mother to maintain her own stores of nutriceant required for fetal and infant health ,as well as, for fetus breast feeding practices .the main recommendation is to follow a healthy and balaneed diet. Pregnam is an occasion , when women become more aware of the importance of health nutrition and seek for more nutrition related information .AS mention above pregnancy is an important condition for improving nutrition knowledge and practice.the present study aimed to determine the effect of nutrition education on awareness and practice of pregnant woman reffered to health care centers in zabol city in 2018

**Methods:** Materials and Methods A quasi – experimental intervemtion was under urban health canters Zabol City 120 pregnant woman selected via a convenience random sampling technique . nutrition education program containing two to four lesson was under taken four small groups of women . Nutritional know ledge was assessed befor intervention (pre test) and followed by post test with in four weeks in terval. Data analyzed by spss ver 19 using chi-score test, paired t test and independent sampl t-test and fisher exant test . Results: mean (SD) age of pregnant women was 27.58(5.63). mean (SD) height , weight and BMI in participants were 162.75 cm (6.8), 62.81 kg(9.64) and 23.64kg/m<sup>2</sup> (3.24) respectively In control group the awareness of majority of them (44.4%) was in moderate level and after intervention a slightly increase observed in their awareness (53.7%) were in moderate level . but level of awareness of pregnant women in case group before intervention were as follow 58% and 4%of them had medium and good awareness and after intervention the levels of awareness were as follow 94% and 6%of pregnant women has good. our findings showed that, the practice level in 68%of case groups was in moderate level and after intervention its increase to 88%good level while in control group 57.4% of pregnant women their practice level was in medium level and a slightly decrease observed after intervention (55.6%) were in moderate levels Analysis of data showed a



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significant direct and positive correlation between the knowledge of pregnant women before intervention with knowledge after intervention and their nutritional practice before and after intervention ( $r=0.266$ ,  $p.value=0.042$ ,  $r=0.297$ ,  $p.value=0.37$  and  $r=0.33$ ,  $p.value=0.038$  respectively), at means improve in Analysis of data showed there was not significant difference between the awareness and nutritional practice of pregnant women with their education levels, occupation, monthly income of family the number of pregnancies, duration of their marriage, the number of family members. According of paired t-test in case group, a significant increase observed between their knowledge and nutrition practice before an after intervention ( $5.66\pm 3.38$  vs.  $16.14\pm 2.1$  and  $13.66\pm 4.15$  vs.  $19.96\pm 3.1$  respectively ( $p<0.05$ )).

**Conclusion:** nutritional education in will have a positive effect nutritional awareness and practices

**Keywords:** nutrition education, awareness, nutrition behavior, pregnant women



## SERUM KYNURENINE & TRIMETHYLAMINE N-OXIDE BIOMARKERS ASSOCIATED WITH CARDIOMETABOLIC RISK FACTORS IN ADULT

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**Background and Aim:** Epidemiologic research suggests that gut microbiota alteration (dysbiosis) may play a role in the pathogenesis of metabolic syndrome (MetS). Dysbiosis can influence Trimethylamine N-oxide (TMAO) a gut microbiota-derived metabolite, as well as kynurenine pathways (KP), which are known as a new marker for an early predictor of chronic diseases. Hence, the current study aimed to investigate the association between KYN and TMAO with cardiometabolic risk factors.

**Methods:** TMAO is an organic compound, gut microbiota-derived metabolite, which is recently found as a new potentially important reason for increased atherosclerosis and MetS (11). Of all the pro-atherosclerotic mechanisms postulated for TMAO the most important are, a rise in vascular inflammation, the platelet hyper-responsiveness, the blockage of reverse cholesterol transport, reducing high-density lipoprotein cholesterol (HDL) in the liver, and affecting bile acids metabolism (12, 13). So TMAO may promote dyslipidemia via regulating cholesterol balance (14). Several systematic reviews and meta-analysis studies found a dose-dependent relationship between circulating levels of TMAO and elevated cardiovascular risk and mortality in humans (15-18). However, there is controversy about the specific role of TMAO in the pathogenesis of MetS, as a collection of cardiometabolic risk factors consisting of abdominal obesity, disrupted lipid profile, high blood sugar, and hypertension which predispose individuals to CVD (11). The kynurenine pathway (KP), which is known as the TRP degradation pathway, can be influenced by the gut microbiota (19). TRP is an exogenous amino acid that is metabolized to KYN by indoleamine 2, 3-dioxygenase (IDO) (20). Inflammatory factors like LPS-derived pathogenesis microorganisms or interleukin (IL-6) can induce IDO activation (21). KP appears to be involved in the development of many chronic inflammatory metabolic disorders, including Mets, and atherosclerosis, all of which are commonly recognized as risk factors for CVD. Altogether, the literature suggests a connection between the KP pathway and TMAO and some components of MetS. However, most of these data derive from experimental research in animals, and little is known about its relevance in human cohorts. Further research needs to clarify the pathway and cellular-molecular mechanism in this context which may lead one to consider whether plasma KYN and TMAO can be a new risk factor CVD. This case-control study was conducted on 250 adults aged 18 years



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or over of Tehran University of Medical Sciences (TUMS). Fasting blood sugars (FBS), low-density lipoprotein (LDL-C), Total cholesterol (TC), TG, and HDL-C were measured via enzymatic colorimetric method and phosphor tungstic acid. Serum concentrations of KYN and TMAO were measured using enzymatic methods. Analyses were carried out using available commercial kits (Shanghai Crystal Day Biotech, Shanghai, China).

**Conclusion:** The mean level of TMAO and KYN in subjects with Mets was 51.49 pg/ml and 417.56 nmol/l. High levels of TMAO compared with the reference group increased the odds of hypertriglyceridemia and low HDL in crude and adjusted models ( $P < 0.05$ ). Additionally, there was a statistically significant high level of KYN increased odds of abdominal obesity ( $P < 0.05$ ). Our study revealed a positive association between serum TMAO and KYN levels and cardiometabolic risk factors. For underlying mechanisms and possible clinical implications of the differences. Prospective studies in healthy individuals are necessary

**Keywords:** Kynurenine, Trimethylamine N-oxide, Metabolic syndrome



## THE ASSOCIATION BETWEEN DIETARY INFLAMMATORY INDEX AND AGING BIOMARKERS/ CONDITIONS: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS

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**Background and Aim:** We performed a current study to examine the association between dietary inflammatory index (DII) score and older age-related muscle conditions, including sarcopenia, low muscle mass, low muscle strength, frailty, and/or disability.

**Methods:** A systematic literature search was performed using Scopus, PubMed/MEDLINE, and ISI Web of Science without limitation until October 04, 2022. Relative risk (RR) and 95% confidence interval (CI) were pooled by applying a random-effects model, while validated methods examined assess quality and publication bias via Newcastle-Ottawa Scale, Egger's regression asymmetry, and Begg's rank correlation tests respectively. A dose-response meta-analysis was conducted to estimate the RRs per 1-unit increment in DII scores. Participants Adults ( $\geq 18$  years) Measures The risk of older age-related muscle conditions (sarcopenia, low muscle mass, low muscle strength, frailty, and/or disability) Results Data were available from 19 studies with 68079 participants. Results revealed that a higher DII score was significantly related to an increased risk of sarcopenia (RR=1.50; 95% CI: 1.26, 1.79; I<sup>2</sup>=53.3%; p<0.001; n=10; sample size =43097), low muscle strength (RR=1.47; 95% CI: 1.24, 1.74; I<sup>2</sup>=6.6%; p<0.001; n=4; sample size =9339), frailty (RR=1.61; 95% CI: 1.41, 1.84; I<sup>2</sup>=0.0%; p<0.001; study=5; participant=3882) and disability (RR=1.41; 95% CI: 1.16, 1.72; I<sup>2</sup>=58.4%; p=0.001; n=5; sample size =13760), but not low muscle mass (RR=1.24; 95% CI: 0.98, 1.56; I<sup>2</sup>=49.3%; p=0.069; n=4; sample size =11222). Additionally, results of the linear dose-response indicated that an increase of one point in the DII score was related to a 14% higher risk of sarcopenia, 6% higher risk of low muscle mass, 7% higher risk of low muscle strength, and a 7% higher risk of disability in adults. Non-linear dose-response relationships also revealed a positive linear association between the DII score and the risk of sarcopenia (Pnonlinearity = 0.097, Pdose-response <0.001), frailty (P nonlinearity = 0.844, Pdose-response=0.010) and disability (Pnonlinearity = 0.596, Pdose-response=0.007).

**Conclusion:** Adherence to a pro-inflammatory diet was significantly associated with a higher risk of sarcopenia and other age-associated adverse effects such as low muscle strength, disability, and frailty. These results indicate a necessity to prioritize the reduction of pro-inflammatory diets to help promote overall older age-related muscle conditions.

**Keywords:** Dietary Inflammatory Index, Aging Biomarkers/Conditions, Dose-response Meta-analysis



## EFFICACY OF FERULA ASSA-FOETIDA IN TYPE 2 DIABETES MELLITUS: A RANDOMIZED, DOUBLE-BLINDED, AND PLACEBO-CONTROLLED TRIAL

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**Background and Aim:** Despite the accessibility of synthetic antidiabetic drugs for the management of type 2 diabetes mellitus (T2DM), the side effects and their cost have created excessive attention for novel natural replacements for administration. The present study evaluated the effectiveness of Ferula Assa-foetida as a potential therapeutic agent against T2DM

**Methods:** In a double-blind, randomized controlled clinical trial (IRCT registration number: IRCT20190525043704N1), patients with T2DM were randomized to receive capsules (250 mg × 2/day) of either starch (placebo, n=10) or Ferula Assa-foetida (Assa-foetida, n=10) for 90 days. Glycemic and lipid profiles, hepatic function tests, hemoglobin A1C, activity of antioxidant enzymes, high sensitive C-reactive protein, malondialdehyde, advanced glycation end products, leptin levels, physical activity, and dietary intake evaluated by semi-quantitative food frequency questionnaire were assessed at baseline and the end of the study.

**Results:** Oral administration of Ferula Assa-foetida in patients with T2DM for 90 days showed a reduction in the values of HDL-C ( $p=0.046$ ) at the end of study compared to the baseline. Additionally, patients in Assa-foetida-treated group indicated a higher value of serum glutamic pyruvic transaminase (SGPT) compared with a placebo at the end of the study ( $p=0.036$ ). Moreover, Assa-foetida-treated group consumed more whole grains, refined grains, and potatoes food groups ( $p=0.018$ ,  $0.034$ , and  $0.028$ , respectively) on the day 90 compared to the baseline and placebo group.

**Conclusion:** Taking the Assa-foetida supplement alone without following positive changes in dietary intake is insufficient to show the anti-hyperglycemic, anti-inflammatory, and antioxidant efficacy of Ferula Assa-foetida in patients with T2DM.

**Keywords:** Ferula Assa-foetida; Type 2 Diabetes Mellitus; Clinical Trial; Hepatic Function; hs-CRP



## EFFECT OF DAILY CURCUMIN SUPPLEMENT CONSUMPTION AND BALANCED DIET ON FBS LEVEL IN PRE-DIABETES

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**Background and Aim:** The global prevalence of IFG in 2021 was 5.8% (298 million) and is projected to increase to 6.5% (414 million) in 2045. Prediabetic patients might face on some complications including macrovascular and microvascular disorders. Therefore, diabetes prevention in these patients is crucial. This study aimed to determine the effect of daily consumption of 2 capsules of curcumin with a balanced and proportional diet without use of glycemic lowering tablets on blood glucose level.

**Methods:** In a quasi-experimental cross-sectional study, 120 Middle-aged patients with prediabetes (FBS $\geq$ 100, <126 mg/dl) without use of blood glucose lowering tablets in Ghods health center of Borujerd was selected randomly for 145 patients. Fasting Blood sugar (FBS) and glycosylated hemoglobin (HbA1c) with a balanced and proportional diet and daily 2 capsules curcumin 500mg as a supplement (Karen company) consumption were assessed in the beginning of the study and three months after intervention.

**Results:** The results indicated a significant decrease in serum FBS level to 21.84 mg/dl (P<0.001) and HbA1c to 0.7 mg/dl (P<0.002) with daily consumption of 2 capsules of curcumin 500mg with balanced and proportional diet.

**Conclusion:** Our findings may encourage curcumin supplementation based on its meaningful effect on glycemic control in prediabetes and preventing diabetes in middle-aged people. and could be suggested as part of medical nutrition therapy for these patients.

**Keywords:** Prediabetes; Curcumin; FBS; Diet



## EFFECTS OF WHITE SESAME SEED ON BLOOD GLUCOSE AND LIPID PROFILE IN TYPE 2 DIABETIC PATIENTS

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**Background and Aim:** Type 2 diabetes is one of the most prevalent endocrine diseases in the world that results from a combination of insulin resistance and pancreatic  $\beta$ -cell failure. Regarding the importance of nutritional factors in management of diabetes, this study was designed to explore the effect of white sesame seed on blood glucose and lipid profile in type 2 diabetic patients in Baghaeipour Clinic in 2020.

**Methods:** A clinical trial study was conducted on 60 patients with type 2 diabetes mellitus who were randomly divided into two groups of 30 sesame seeds consumers (case) and 30 non sesame seeds consumers (control). The case group received 60 g/day sesame seeds for 3 months and the control group did not receive any sesame seeds. Plasma glucose, glycated hemoglobin (HbA1C), lipid profiles [Total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C) and triglycerides (TG)] were measured at baseline and after 3 months. 24 hours' dietary recalls were obtained at the first and end of the study. Analysis of variance with repeated measures t-test and paired t-test were applied for comparison variables at baseline and the end of study.

**Results:** The results showed FBS, HbA1C, TC, LDL-c, TG had significant difference after the consumption of sesame seeds ( $P < 0.05$ ). Also the changes of HDL-c levels were not significant.

**Conclusion:** Our data have shown white sesame seed consumption can decrease blood sugar, HbA1C and blood lipids in type 2 diabetics.

**Keywords:** Sesame, Hyperlipidemia, Blood glucose, Type 2 Diabetes mellitus





## EFFECT OF STEVIA CONSUMPTION ON BODY WEIGHT, ENERGY INTAKE AND APPETITE: A REVIEW OF CLINICAL TRIAL STUDIES

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**Background and Aim:** The use of non-nutritive sweeteners has grown significantly in the last few years intending to reduce caloric intake and prevent weight gain. It is worth mentioning that non-nutritive sweeteners are metabolized differently from each other due to their different properties. Therefore, the difference in metabolic fate of these sweeteners may underlie conflicting findings that have been reported related to their effects on body weight control and biological mechanisms. In this regard, the present study was conducted to summarize the information obtained from clinical trial studies regarding the effect of Stevia sweetener consumption on body weight, energy intake, appetite, and the desire to eat sweets.

**Methods:** Studies published between 2010 and 2023 were searched in PubMed, Google Scholar, and Science Direct databases using the keywords Stevia, Non-nutritive Sweeteners, Body Weight, Energy Intake, Satiety, and Appetite. The results of 9 clinical trial studies were included.

**Results:** In studies that were conducted with the aim of long-term effects of stevia consumption on body weight and energy intake, no significant difference was observed in changes in weight and energy intake. The findings of studies on the effect of short-term consumption of stevia on food intake and satiety showed that a beverage or food containing stevia increases satiety and reduces appetite and the desire to eat prior to a meal.

**Conclusion:** Replacing sugar and natural sugar with stevia can maintain and control weight in adults, without increasing effect on appetite or the desire to eat sweets. It could be a useful strategy in obesity prevention and management.

**Keywords:** Stevia, obesity, weight loss, energy intake, appetite, non-nutritive sweeteners



## INVESTIGATING THE EFFECTS OF SUGAR AND CAFFEINE IN ENERGY DRINKS ON TYPE 2 DIABETES

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**Background and Aim:** Over the last decade, the consumption of energy drinks (EDs) (e.g., containing caffeine and sugar) has become more prevalent among adolescents and athletes to enhance cognitive and athletic performance. Abundant research articles have shown the negative effects of excessive caffeine and sugar intake. This systematic review aims to examine the association between ED consumption and the increased risk factor of type 2 diabetes (T2D).

**Methods:** We searched several databases, including Pubmed, ScienceDirect, Google Scholar, Scopus, Web of science, using keywords such as energy drinks, type 2 diabetes, sugar, and caffeine. The final selection included 10 relevant studies. This review incorporates relevant observational and interventional studies published between 2010 and 2023.

**Results:** The results of these studies indicated that EDs led to a significant increase in blood glucose levels. The consumption of EDs not only promotes weight gain but also independently increases the risk of T2D through the glycemic effects of consuming large amounts of rapidly absorbable sugars and the metabolic effects of fructose. One of the studies also demonstrated that the ingestion of caffeine resulted in elevated serum insulin, proinsulin, and C-peptide concentrations, as well as increased blood glucose levels

**Conclusion:** Implementing the simple change of limiting ED intake could have a measurable impact on weight control and the risk of T2D and other metabolic diseases in the general population. However, the findings of this review were inconclusive, highlighting the necessity of further research to draw more definitive conclusions

**Keywords:** energy drinks, Type 2 diabetes, sugar, caffeine



## THE DOSE-RESPONSE EFFECT OF CO-ENZYME Q10 INTERVENTION ON CIRCULATING C-REACTIVE PROTEIN CONCENTRATIONS IN ADULTS: A GRADE-ASSESSED SYSTEMATIC REVIEW AND META-ANALYSIS OF 25 RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Coenzyme Q10 (CoQ10) supplementation has an inverse relationship with inflammation and inflammatory markers related to chronic disease. However, the results of available clinical trial studies are inconsistent, therefore we summarized 25 randomized clinical trials (RCTs) and evaluated the association of CoQ10 intervention with inflammatory marker C-reactive protein (CRP).

**Methods:** A comprehensive search was done in the databases until April 2022 with the aim of finding all RCTs that examined the effect of CoQ10 on CRP. Net changes CRP were used to calculate the effect size, which was reported as a weighted mean difference (WMDs) and 95% confidence intervals (CIs).

**Results:** Twenty-five trials with 28 treatment arms involving 1407 participants were included. Pooled effect sizes indicated a significant reducing effect of CoQ10 intervention on CRP (WMD: -0.54 mg/L, 95% CI: -0.90 to -0.18; P = 0.003) with significant heterogeneity (I<sup>2</sup> = 81.82; p < 0.001). In sub-group analysis, a more reduction was observed at a dose <200 mg/day (WMD: -0.80 mg/L, 95% CI: -1.33, -0.25, p = 0.004), baseline CRP ≥3 mg/L (WMD: -1.31 mg/L, 95% CI: -1.77 to -0.84, p < 0.001), and with treatment duration ≥12 weeks (WMD: -0.81 mg/L, 95% CI: -1.24, -0.38, p < 0.001). A dose-response analysis revealed that <200 mg/day of CoQ10 largely decreased CRP (P-nonlinearity = 0.042).

**Conclusion:** The current evidence from RCTs showed that CoQ10 supplementation may significantly reduce CRP at doses lower than 200 mg/day and in patients with CRP ≥3 mg/L when the supplementation lasts over 12 weeks

**Keywords:** Coenzyme Q10, C-reactive protein, Inflammation



## THE ASSOCIATION BETWEEN OVERALL, HEALTHY, AND UNHEALTHY PLANT-BASED DIET INDEX AND TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS

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**Background and Aim:** The global incidence of Type 2 Diabetes Mellitus (T2DM) has experienced a significant rise in recent years. Among the established modifiable lifestyle factors associated with a favorable T2DM risk, healthy dietary patterns have attracted considerable attention. The objective of this study was to investigate the association between adherence to Plant-based Dietary Pattern indices (PDIs), including the O-PDI (overall Plant-based Dietary index), H-PDI (healthy Plant-based Dietary index), and U-PDI (unhealthy Plant-based Dietary index), and the risk of T2DM.

**Methods:** A literature search was conducted in PubMed/Medline, Scopus, the Web of Sciences databases from their inception July, 2023. A systematic review and meta-analysis employing random effects models and dose-response analyses were carried out. The Cochran Q test and the I<sup>2</sup> statistic were employed to evaluate heterogeneity between studies.

**Results:** A total of 16 populations (12-publications), totaling 630985 participants were identified to enter our meta-analysis. According to pooled analysis, compared to the lowest category of O-PDI and H-PDI adherence, the highest category was associated with a 15% and 19% reduction in T2DM risk, respectively; for O-PDI:(ES=0.85;95%-CI:0.82-0.89); for H-PDI:(ES=0.81;95%CI: 0.75-0.89). Greater adherence to U-PDI was significantly associated with an 8% increase in the risk of T2DM (ES:1.08;95%-CI:1.04-1.12). Consistent associations were found within the predetermined subgroups. As well, there was a non-linear inverse association between O-PDI, H-PDI, and T2DM risk.

**Conclusion:** These findings underscore the significance of dietary selections within the framework of a plant-based dietary pattern, particularly when incorporating healthful plant-based foods, which may have potential benefits in reducing the T2DM risk.

**Keywords:** plant based diet index, type 2 diabetes mellitus, meta-analysis



## DIETARY INFLAMMATORY POTENTIAL AND RISK OF OVERALL AND SITE-SPECIFIC COLON CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS OF OBSERVATIONAL STUDIES

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**Background and Aim:** In the last decades, it has been well known that low grade inflammation plays a potential role in the pathogenesis of different cancers. The aim of this systematic review and meta-analysis of observational studies was to evaluate the association between inflammatory potential of diet measured through the Dietary Inflammatory Index (DII), energy-adjusted DII (E-DII), empirical dietary inflammatory pattern (EDIP) and inflammatory score of the diet (ISD) and risk of colorectal cancer (CRC) and site-specific colon cancer.

**Methods:** A systematic electronic search of PubMed/Medline, Scopus, the Web of Sciences, and reference lists up to November 21, 2023, was performed. Data were pooled by the generic inverse variance method using random effect model. To assess the heterogeneity of included studies, the I<sup>2</sup> index was used.

**Results:** A total of 28 original studies, comprising 2,287,836 participants, were selected to include in this meta-analysis. Pooled results showed a significant association between higher adherence to proinflammatory diet and increased risk of CRC (ES:1.39;95%CI:1.29-1.51;I<sup>2</sup>=82.9%), colon (ES:1.40;95%CI:1.26-1.55; I<sup>2</sup>= 73.3%, p<0.01), proximal colon (ES:1.28; 95% CI:1.17-1.40;I<sup>2</sup>=29.1%), distal (ES:1.50;95%CI:1.30-1.74;I<sup>2</sup>=63.5%) and rectal (ES:1.46;95%CI:1.23-1.74;I<sup>2</sup>=80%). Stratified analysis by type of dietary indices noted that greater adherence to the DII, E-DII and EDIP were related to significant increase in risk of overall CRC and site-specific colon cancers.

**Conclusion:** Our results highlighted the proposed role of inflammatory potential of diet as important risk factor for CRC. Adherence to an anti-inflammatory dietary pattern should be recommended to reduce incidence of CRC, globally.

**Keywords:** Inflammatory potential of diet, Dietary Inflammatory Index, empirical dietary inflammatory pattern, inflammatory indicators, colorectal cancer



## EFFECTS OF THE DASH DIET ON CARDIOMETABOLIC OUTCOMES IN PATIENTS WITH FATTY LIVER: A COMPREHENSIVE REVIEW

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**Background and Aim:** Fatty liver is a prevalent health care issue with increasing prevalence over time. Effective, evidence-based interventions are needed to prevent and manage fatty liver, improve patient longevity, control symptoms, and enhance quality of life. Interventions such as the Dietary Approaches to Stop Hypertension (DASH) diet, rich in fruits, vegetables, whole grains, and low-fat dairy products, may have a positive impact on patients with fatty liver.

**Methods:** This study conducted a comprehensive review by searching electronic databases, including Medline, Embase, Scopus, ISI and Google Scholar. Keywords used for article selection included "DASH," "Fatty Liver," "Insulin sensitivity," and "Dietary Approaches to Stop Hypertension."

**Results:** Studies have demonstrated that adhering to the DASH diet may help prevent or manage fatty liver disease. This is attributed to the DASH diet's low saturated and trans fat content, which can contribute to fatty liver disease development. Additionally, the high fiber content of the DASH diet may improve insulin sensitivity, thereby reducing the risk of fatty liver disease. However, further research is necessary to fully understand the relationship between the DASH diet and fatty liver disease.

**Conclusion:** Despite the challenges associated with dietary pattern changes, the DASH diet is a recommended intervention for patients with fatty liver, although its effectiveness may vary based on the individual's health status and lifestyle. In conclusion, following the DASH diet has shown potential for significantly improving liver function in patients with fatty liver by reducing weight and BMI, improving glycemic response, and reducing meta-inflammation.

**Keywords:** "Insulin sensitivity", "Fatty liver", "DASH diet", "Dietary Approaches to Stop Hypertension"



## EFFECTS OF KETOGENIC DIET ON THE NON-ALCOHOLIC FATTY LIVER DISEASE: A COMPREHENSIVE REVIEW

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**Background and Aim:** Non-alcoholic fatty liver disease (NAFLD) is a prevalent metabolic disorder characterized by the accumulation of excess fat in the liver. The ketogenic diet (KD) is a high-fat, low-carbohydrate, and moderate-protein diet that has gained popularity for its potential benefits in weight loss and the management of metabolic disorders. This review aims to provide a comprehensive overview of the current evidence regarding the effects of the KD on NAFLD.

**Methods:** Relevant keywords were used to systematically search PubMed, Google Scholar, Embase, Scopus, and ISI databases. Studies published in English were reviewed without any time limit.

**Results:** NAFLD is a major cause of chronic liver disease, characterized by altered lipid metabolism primarily linked to mitochondrial dysfunction. The KD has been found to alleviate oxidative stress and improve mitochondrial function by stimulating mitochondrial biogenesis, mitochondrial dynamics, and bioenergetic pathways. Additionally, the KD has shown significant improvement in liver function tests such as alanine aminotransferase and aspartate aminotransferase in individuals with NAFLD. It also leads to notable improvements in insulin resistance, lipid profiles, and inflammatory markers in these individuals. Given the multiple metabolic effects of the KD, it is a potential treatment option for NAFLD.

**Conclusion:** Experts currently recommend a weight loss of >7-10% in overweight or obese patients with NAFLD, as weight reduction has been associated with improved liver steatosis, inflammation, and fibrosis. The available evidence suggests that the KD results in long-term reductions in body weight and may have beneficial effects on NAFLD through improvements in liver function tests, insulin resistance, lipid profiles, and inflammatory markers.

**Keywords:** Non-alcoholic fatty liver disease, ketogenic diet, oxidative stress, liver disease, lipid profiles



## EFFECTS OF THYLAKOID SUPPLEMENTATION ON BODY WEIGHT: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROL TRIALS

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**Background and Aim:** Thylakoid supplementation has been proven to be beneficial for weight management. Research studies have shown that thylakoids can lead to significant reductions in weight, waist circumference, and fat mass promoting the excretion of fat in individuals with obesity. However, the current data from randomized controlled trials (RCTs) show varying and inconclusive results. This systematic review and meta-analysis aims to investigate the effect of thylakoid supplementation on weight changes.

**Methods:** A comprehensive literature search was prepared before conducting a systematic search in several databases up to May 2023. The data were obtained using STATA version 13. Effect sizes were reported as weighted mean differences (WMD) and 95% confidence intervals (CI).

**Results:** Data were collected from seven eligible trials with 4 treatment arms for animal studies and 4 treatment arms for human studies in which 151 individuals and 114 rat/mice were compared in terms of weight changes after thylakoid supplementation. Results showed that although thylakoid supplementation significantly reduced body weight in animal studies (WMD: -4.489 gr, 95% CI: -7.664, -1.314; P: 0.006) with non-significant heterogeneity (I<sup>2</sup>: 9.2%, P: 0.347), the weight loss was not significant in human studies (WMD: -1.880 kg, 95% CI: -4.363, 0.603; P: 0.138) while the studies did not have significant heterogeneity (I<sup>2</sup>: 0%, P: 0.543).

**Conclusion:** Thylakoid supplementation is associated with significant weight loss or less weight gain in animals, but no significant weight change was obtained in human studies.

**Keywords:** obesity, thylakoid, spinach, Spinach-derived thylakoid, body weight, obesity management





## EFFECT OF CHIA SEED ON CARDIO-METABOLIC RISK FACTORS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Interest has grown in chia seed supplementation's ability to treat chronic conditions. Higher seed fiber, protein, and omega-3 fatty acid concentrations improve anthropometric measures, blood pressure, glycemic parameters, lipid profile, and inflammatory markers. Effective treatment of chronic illnesses is needed as their prevalence rises. However, geographical location, post-harvest procedures, and growing methods may affect chia seed chemical composition and supplementation effects.

**Methods:** To evaluate the effects of chia seed supplementation, a systematic review and meta-analysis were conducted, encompassing fourteen clinical trials with a total of 729 participants. The treatment duration across the studies ranged from 8 to 24 weeks, and the methodological quality of the included studies was assessed using the Cochrane Collaboration. The effect size was assessed using the standard mean difference (SMD) and 95% confidence intervals, with statistical analysis demonstrating significant effects on systolic and diastolic blood pressure, as well as total cholesterol.

**Results:** Systolic, diastolic, and total cholesterol levels were significantly affected by chia seed administration. Chia seeds' dietary fiber modulates hepatic metabolism to increase satiety and lower total cholesterol level. The PUFA content of chia also lowered serum triglycerides and other lipid pathways.

**Conclusion:** Chia seed supplementation shows promise in improving various health markers, but its effects may vary based on factors such as dosage, duration, and geographical variations. Further research is necessary to fully understand the impact of chia seed supplementation on overall health and well-being, taking into account these influencing factors.

**Keywords:** Chia seed, cardio-metabolic risk, blood pressure, glycemic control



## THE EFFICACY OF SELENIUM SUPPLEMENTATION IN MANAGING HASHIMOTO'S THYROIDITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Hashimoto's thyroiditis, a common autoimmune condition, causes persistent thyroid inflammation and hypothyroidism. Due to its immune system regulation and oxidative stress reduction, selenium, an important trace element, may treat Hashimoto's thyroiditis. The research on selenium supplementation for Hashimoto's thyroiditis is inconsistent. This systematic review evaluates the data to assess how selenium supplementation affects Hashimoto's thyroiditis clinical outcomes.

**Methods:** To find high-quality English-language studies, PubMed, MEDLINE, EMBASE, and the Cochrane Library will be searched extensively. The search approach will include "selenium," "Hashimoto's thyroiditis," "autoimmune thyroiditis," and "thyroid autoimmunity." To find other significant research, relevant article and review reference lists will be carefully analyzed. Randomized controlled trials, observational studies, and systematic reviews on selenium supplementation for Hashimoto's thyroiditis will be included. Critical study features, participant demographics, intervention details, and thyroid function and autoimmunity results will be extracted.

**Results:** The systematic search approach found many papers, but only a handful satisfied the rigorous inclusion requirements for this systematic review. The included randomized controlled trials and observational studies included many Hashimoto's thyroiditis patients. These carefully chosen research will be combined to assess how selenium supplementation affects thyroid function, autoimmune markers, and clinical outcomes in Hashimoto's thyroiditis patients.

**Conclusion:** The findings of this review are anticipated to significantly contribute to a deeper understanding of the potential role of selenium in the management of autoimmune thyroid disorders.

**Keywords:** Selenium, Hashimoto, thyroiditis,



## ASSOCIATION BETWEEN DIETARY PHYTOCHEMICALS AND THE RISK OF NON-ALCOHOLIC FATTY LIVER DISEASE: A CASE-CONTROL STUDY

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**Background and Aim:** NAFLD is becoming the most prevalent cause of liver disease globally and there are nutrients that could prevent developing hepatic disease. This study examined the association between consuming a diet rich in phytochemicals and the risk of NAFLD.

**Methods:** We assigned a total of 243 eligible subjects into two groups - case and control. The case group included 121 incidence cases of NAFLD while the control group had 122 healthy individuals. The two groups were carefully matched based on age, body mass index, and sex to ensure fairness in the evaluation process. We used a FFQ to evaluate the food intake of all participants. Binary logistic regression analysis was conducted to assess the risk of NAFLD with the intake of dietary phytochemicals.

**Results:** Participants in the top tertiles of DPI had significantly higher intakes of fruits, legumes, nuts and seeds compared to those in the bottom tertiles. In the crude model, participants in the highest tertile of DPI decreased chance of having NAFLD compared with those in the lowest tertile (OR:0.59; 95%CI: 0.33-1.06, P-trend<0.001). After adjustment for possible confounders in model 1 (OR 0.26; 95% CI 0.13–0.51, P-trend<0.001) and model 2 (OR:0.27; 95%CI: 0.13-0.56, P-trend<0.001) this association remained significant.

**Conclusion:** Our observations revealed that higher DPI is significantly associated with lower risk of NAFLD. This could be a guide to underline the recommendation of more consumption of phytochemical-rich foods to protect against NAFLD. To confirm these findings, well-conducted prospective studies are needed.

**Keywords:** NAFLD, dietary phytochemical index, dietary intake, non-communicable diseases



## THE EFFECTS OF OLEOYLETHANOLAMIDE SUPPLEMENTATION ON ABDOMINAL OBESITY INDICES IN OBESE ADULT PATIENTS WITH NEWLY DIAGNOSED NON-ALCOHOLIC FATTY LIVER DISEASE: A TRI-PL- BLIND, RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** BMI is used as a surrogate indicator of body fat content but cannot reflect body fat distribution. Recent studies indicated that adipose tissue distribution instead of the actual amount of body fat might play a more crucial role in the progression of metabolic diseases or all-cause mortality. We aimed to examine the effects of OEA (Oleoylethanolamide) supplementation combined with calorie restriction on visceral obesity index (VAI), lipid accumulation (LAP) and deep abdominal adipose tissue (DAAT) in obese adult patients with NAFLD.

**Methods:** This randomized, triple-blind, placebo-controlled clinical trial was carried out on 65 obese patients newly diagnosed with NAFLD. Eligible subjects were randomly allocated into either OEA (two 125-mg OEA capsules daily) or placebo (two 125-mg starch capsules daily) groups along with calorie-restricted diets for 12 weeks. Fundamental indicators calculated the VAI, LAP, and DAAT.

**Results:** There was a significant change VAI, LAP, and DAAT between the two groups even after controlling for potential confounders. Between group analyses demonstrated a significantly decrease in VAI, LAP, and DAAT indices in the OEA group compared to the placebo, post-intervention (95% confidence interval [CI]: -2.2 to 0.4,  $P = 0.007$ ; 95% CI: -43.45 to -12.81,  $P = 0.001$ ; 95% CI: -84.4 to -10.28,  $P = 0.013$ ) respectively.

**Conclusion:** This study provides evidence supporting the beneficial effects of OEA supplementation on abdominal obesity indices. Further studies are needed to confirm our findings.

**Keywords:** Oleoylethanolamide, clinical trial, obesity, NAFLD, abdominal obesity indices



## THE ROLE OF INSUFFICIENT SLEEP IN OBESITY: A SYSTEMATIC REVIEW

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**Background and Aim:** Insufficient sleep is defined as sleeping less than recommended for health benefits. Sleep disturbances are common in nearly one-third of adults and sleep duration in the humans has been decreasing over the past half-century, while at the same time rates of overweight and obesity have been increasing. Both low quality of sleep and sleep time could be related to increased obesity. Present review focuses on the randomized controlled trial studies examining the relationship between insufficient sleep and obesity

**Methods:** A systematic review of 36 randomized controlled trial, published from 2008 to January 2024, was conducted using 8 bibliographic databases. Search terms included Insufficient sleep and obesity

**Results:** Insufficient sleep, in many ways predispose individuals to poor metabolic health and promote weight gain, Including perturbs the metabolic milieu via alterations in appetite hormones such as leptin, ghrelin, and peptide-YY energy expenditure, neuroendocrine and autonomic nervous systems. Also sleep restriction is associated with changes in energy homeostasis, insulin resistance and  $\beta$ -cell function. Although in some studies adiponectin levels were negatively associated with sleep duration. sleep loss predisposes people to abdominal visceral obesity. An increase in visceral adipose tissue can result in the secretion of inflammatory cytokines. Inflammatory cytokines can lead to a disturbance of the sleep-wake rhythm. So Insufficient sleep and weight gain have a two-way relationship

**Conclusion:** Given the importance of sleep in maintaining energy homeostasis and that it is potentially modifiable, promoting good sleep hygiene may create new avenue for obesity prevention and treatment

**Keywords:** Sleep. Obesity. Insufficient



## RELATIONSHIP BETWEEN VITAMIN C SUPPLEMENTATION AND P53 STATUS: A SYSTEMATIC REVIEW IN VIVO AND IN VITRO STUDY

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**Background and Aim:** Ascorbic Acid(AA) is a water-soluble vitamin that showed promising effects in cancer. Also, P53 is an autonomous tumor suppressor by induction of senescence. This systematic search aims to evaluate the impact of AA on P53 in in vivo and in vitro literature.

**Methods:** A systematic search was carried out on databases including PubMed/Scopus /web of sciences, and Google Scholar. Among, 1363 studies eighteen studies remained for data extraction.

**Results:** The AA supplementation in vivo and in vitro and human cancer cells studies do not demonstrate a constant effect. The AA when combined with taurine (spinal cord), chromium (brain tissue), UVB (skin), monosodium glutamate (liver), cisplatin (liver), and Ducribicine (heart) was lead to reduction of P53 level. Contrary, when combined with PM2.5 particulate(lung), nicotine (spleen), N acetyl cysteine (human cancer cells) increased the expression of P53. However, AA presented increased effect when solely supplemented in SKM-1 cells (showed inhibition effect on acute myeloid leukemia by showing mutations effect in the TP53 gene) and Human retinal pigment epithelium or decreased effect in spinal cord, adipose tissue, hypoxia condition in placental tissue and brain tissue. AA did not show significant change in P53 when solely placental tissue supplemented in heart tissue and under condition of increasing oxygen level.

**Conclusion:** This study showed that combinations of AA with some medications are promising for controlling cancers in some organs. Also, it showed an increasing effect on P53 in some tissues.

**Keywords:** P53, Ascorbic Acid, Cancer, Senescence



## ASSESSMENT OF MALNUTRITION RISK AND ASSOCIATED FACTORS IN ADULT CANCER PATIENTS RECEIVING CHEMOTHERAPY TREATMENT: A CROSS-SECTIONAL STUDY

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**Background and Aim:** The effect of cancer on the nutritional status of patients can have significant implications, potentially worsening related complications and hindering treatment effectiveness. Malnutrition related to cancer is a prevalent issue among these patients. Hence, this study aimed to evaluate the nutritional status of cancer patients using the malnutrition universal screening tool (MUST) questionnaire and implement suitable interventions to enhance their quality of life and alleviate complications

**Methods:** For this descriptive cross-sectional study, a total of 71 cancer patients receiving chemotherapy were included. The study was conducted at the Oncology Unit of Shahid Jalil Hospital in Yasuj, located in the Kohgiluyeh and Boyer-Ahmad Province, Iran.

**Results:** The study results indicated significant associations between age and cancer type with the risk of malnutrition among the patients ( $p=0.043$ ,  $p=0.008$ , respectively). Additionally, a significant relationship was found between gender and malnutrition risk ( $p=0.033$ ). Specifically, 48.65% of men were identified as being at a high risk of malnutrition. Gastrointestinal and breast cancers were the most prevalent types of cancer observed in the study, accounting for 42.25% and 28.17% of cases, respectively. Overall, 62% of the patients exhibited moderate to severe malnutrition.

**Conclusion:** The study's conclusions highlight that a high prevalence of malnutrition was observed among the patients analyzed, as indicated by the MUST scores. Consequently, it is crucial to promptly diagnose malnutrition related to cancer and implement appropriate intervention strategies. These measures are essential for improving patients' quality of life and potentially reducing cancer mortality rates.

**Keywords:** Cancer, Nutritional status, Malnutrition, Nutrition assessment



## DAILY NUTRITIONAL STATUS, TOTAL PROTEIN AND NUTRIC SCORE IN CRITICALLY ILL ADULT PATIENT ADMITTED TO THE INTENSIVE CARE UNIT: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Malnutrition is a common issue among patients who are hospitalized, and it can have a substantial effect on their clinical outcomes. As a result, it is crucial to conduct nutritional assessments and screenings in order to effectively manage critically ill patients.

**Methods:** Out of the 100 patients who were evaluated, (64.1% male). The median age of the patients was 59.48 years (18-92). Neurological disorders accounted for the primary clinical diagnosis (in 50.5%). The mean NUTRIC score, a measure of nutritional risk, was 4.3774 among all the patients included in the study, with scores ranging from 1 to 8. The most frequently observed NUTRIC scores among the patients were 4 and 6. In terms of protein adequacy, it was found that 48.3% of patients did not achieve the recommended level, with only 51.7% meeting the minimum protein intake recommendation. The occurrence of mortality was associated with the nutritional diagnosis, length of ICU stays ( $p = 0.041$ ), and protein adequacy ( $p = 0.012$ ).

**Results:** In this cross-sectional study, patients who met the following criteria were included: age over 18 years, hospitalization in the ICU for a duration exceeding 3 days, receipt of enteral nutrition (EN) and/or parenteral nutrition (PN) on the day of screening, and stable hemodynamic condition. The patients were selected from hospitals that had ICU departments affiliated with Isfahan University of Medical Sciences.

**Conclusion:** The clinical outcomes of critically ill patients were found to be significantly associated with their nutritional status and protein intake.

**Keywords:** Malnutrition, nutritional status, ICU, Assessment





## THE FOOD PATTERN DILEMMAS AND MATERNAL ANAEMIA IN THE SOUTH-WESTERN IRAN

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**Background and Aim:** This study was conducted to determine the dietary dilemmas related to the prevalence of anemia among pregnant mothers living in the southwest Khuzestan province, Abadan.

**Methods:** In this descriptive-analytical cross-sectional survey, 301 Iranian pregnant women referred to comprehensive health centres in 2021 in Abadan, Iran were selected by a multistage random sampling method. The usual dietary intake of the participants was collected by a semi-quantitative food frequency questionnaire and categorized into eight food groups: (1) grains, (2) legumes, (3) vegetables, (4) protein, (5) fruits, (6) dairy products, (7) oils and fats, and (8) unhealthy foods. The chi-square test was used to analyze data.

**Results:** In terms of the vegetable group, 133 (84.7%) non-anemic women and 38 (90.5%) anemic women consumed bell peppers monthly ( $p < 0.05$ ). Regarding fruit groups, four (2.5%) non-anemic women and one (2.4%) anemic woman consumed pomegranates weekly. Moreover, 50 (31.8%) non-anemic and 25 (61%) anemic women consumed dates weekly ( $p < 0.01$ ). In the unhealthy food group, 12 (28.6%) anemic women and 27 (17.2%) non-anemic women consumed cookies as a snack weekly ( $p < 0.05$ ), and 109 (69.4%) non-anemic women and 39 (92.9%) anemic women consumed pickled cucumbers weekly ( $p < 0.05$ ).

**Conclusion:** A higher intake of bell peppers, pomegranates, and dates and a lower intake of cakes and pickled cucumber may be protective factors against the incidence of anemia among the pregnant women living in the South-West of Iran. This study emphasizes the positive role of healthy dietary pattern and self-care practices in controlling anaemia.

**Keywords:** Anaemia; Food pattern; Dietary dilemmas; Pregnant women; Abadan



## MATERNAL ANAEMIA IN ABADAN, SOUTH-WESTERN IRAN: PREVALENCE AND UNDERLYING FACTORS

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**Background and Aim:** This survey aimed to estimate the prevalence of maternal anaemia and identify its underlying factors among pregnant women.

**Methods:** In this cross-sectional survey, 301 Iranian pregnant women with a mean gestational age of  $25.3 \pm 9.7$  weeks referred to comprehensive health centers during 2021 in Abadan, Khorramshahr, and Shadegan were selected by a multistage random sampling method. The disease history, laboratory, anthropometric, obstetric, and socio-demographic characteristics; were collected. Regression analysis was applied to analyze data.

**Results:** The rate of anemia in the second and third trimesters was 20.3%, of which 75%, 23.4%, and 1.6% were mild, moderate, and severe, respectively. The history of anemia before pregnancy was the most potent risk factor (OR= 6.048, 95% CI: 2.002–18.27,  $p \leq 0.001$ ). The chance of anemia in women who did not have risk or disease in the current or previous pregnancies was 5.5 times higher than in women who had at least one risk or disease in the current pregnancy or previous ones (OR=5.539, 95% CI: 2.783–11.002,  $p \leq 0.001$ ). The odds ratio of women who took iron supplements 1 to 5 times a week during pregnancy increased by 2.8 times compared to 6 to 10 times a week (OR=2.799, 95% CI: 1.438–5.450,  $p < 0.01$ ).

**Conclusion:** Twenty percent of pregnant mothers living in South-Western Iran suffered from anemia. The history of anemia before pregnancy, risk or disease in the current or previous pregnancy, and iron supplementation during pregnancy may have played a determinant role in the development of maternal anemia.

**Keywords:** Anaemia; Risk factor; Pregnant women; Iron supplementation; Abadan



## VITAMIN B12 DEFICIENCY IN VEGAN DIET; NOVEL APPROACHES FOR ITS DELIVERY

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**Background and Aim:** This review aims to assess the prevalence of vitamin B12 deficiency in vegan diets and, with a specific focus, evaluate the potential of plant protein-based encapsulation methods as a strategy for mitigating deficiency risks. The objective is to explore and analyze existing literature to understand the efficacy of encapsulation in enhancing vitamin B12 stability, bioavailability, and absorption within the context of plant-based diets.

**Methods:** The review concentrates on studies examining the encapsulation of vitamin B12 within plant proteins. The selected studies primarily investigated encapsulation techniques, such as particles, fibers, films, and hydrogels, employing plant proteins as carriers for vitamin B12. The methods and outcomes of these studies were critically evaluated to gauge the effectiveness of plant protein encapsulation in preserving and delivering vitamin B12.

**Results:** The results highlight the potential of plant protein-based encapsulation as a promising method for addressing vitamin B12 deficiency in vegan diets. Studies indicate that encapsulation enhances the stability of vitamin B12, protecting it from degradation caused by environmental factors. Moreover, these delivery systems offer a means to release vitamin B12 in a controlled manner, potentially improving its bioavailability within the human body.

**Conclusion:** In conclusion, the review underscores the significance of exploring encapsulation within plant proteins as a viable strategy to tackle vitamin B12 deficiency in vegan diets. Encapsulation methods have shown promise in protecting and delivering vitamin B12, providing a potential avenue for developing effective supplements or fortified foods for individuals adhering to plant-based lifestyles.

**Keywords:** Vitamin b12, encapsulation, plant protein, vegan diet



## COMPARISON OF THE EFFECTS OF DIET WITH AND WITHOUT PHYSICAL ACTIVITY ON SERUM LIPID PROFILE OF OBESE WOMEN

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**Background and Aim:** The unfavorable lipid profile in obese individuals is associated with high incidence of various diseases including cardiovascular disease, hypertension, etc. Dieting for weight loss and physical activity are among the most important factors affecting the serum lipid profile. The aim of this study was to compare the effect of diet with and without physical activity on body mass index and serum lipid profile of obese women.

**Methods:** This clinical trial was performed in 2011 on 39 obese women referred to a weight loss and nutrition counseling center. Subjects were randomly divided into an active group (diet and exercise) and inactive group (diet without exercise). Blood sampling was done before the intervention and two months after the intervention. Data was analyzed using SPSS and t-test.

**Results:** Mean level of triglyceride reduced significantly in both groups. Mean level of cholesterol and low-density lipoprotein decreased significantly only in the active group. The Mean level of high-density lipoprotein in the two groups had no significant difference.

**Conclusion:** The results indicate that dieting for weight loss along with short-term physical activity improves serum levels of cholesterol and low-density lipoprotein, but does not affect serum HDL level.

**Keywords:** Diet, Exercise, Triglyceride, Cholesterol, LDL, HDL



## EFFECT OF TYPE AND INTENSITY OF EXERCISE ON GUT MICROBIOME

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**Background and Aim:** The microbiome living in the human intestine, which has beneficial functions such as immunity and production of useful metabolites, changes under the influence of various factors. Exercise may be an important intervention to change gut microbial composition.

**Methods:** Search databases like Scopus, PubMed and Science Direct using keywords athletes and gut microbiota

**Results:** According to recent research, due to the relationship between respiratory function and intestinal microbial diversity, aerobic exercise increases the diversity of the microbiome and improves functional metabolism, which leads to the risk of obesity and metabolic and behavioral diseases. Being amateur or professional athlete affects the abundance and types of intestinal bacteria. In professional athletes and high-intensity training, an increase in bacteria involved in inflammatory processes, such as *Haemophilus* and *Rothia*, *Mucispirillum*, and *Ruminococcus gnavus*, increase in colon pH, increase in intestinal permeability, and overall adverse changes in the intestine and GI system, such as cramps and diarrhea, have been observed. In some studies, high-intensity interval training increases the growth of bacteria essential for urease production and lactate metabolism and increases *Faecalibacterium* that are beneficial. Moderate-intensity exercise in rats resulted in modulation of the gut microbiome and improvement of the intestinal barrier.

**Conclusion:** According to studies, aerobic exercise has positive effects on the gut microbiome and intense endurance training has adverse effects on the GI and gut microbiome. More studies are needed to determine the effect of the type and intensity of exercise on the intestinal microbial composition and function.

**Keywords:** sport, athlete, gut, gut microbiome, exercise



## FUNCTIONAL AND NUTRITIONAL VALUES OF PEA PROTEINS AS A PLANT-BASED SOURCE

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**Background and Aim:** This study looks into why pea proteins could be a good plant-based option for getting protein in our diets. People want more protein because it's good for our health, and there are more people in the world, but getting a lot of protein from animals can be bad for the environment. Producing 1 kilogram of good-quality animal protein needs 6 kilograms of plant protein for the animals to eat, and this puts a lot of pressure on land and water resources, plus it can lead to more greenhouse gas emissions. So, we need alternatives that are cheap, good for the environment, and healthy. Plant proteins, like those from peas, fit the bill.

**Methods:** Pea proteins have a lot of a kind of amino acid called lysine but not much of another called methionine. Rice proteins, on the other hand, have plenty of methionine but not much lysine. When you combine them (mix them together), they become a complete protein, which is great for our bodies. Combining pea and rice proteins makes sure we get all the amino acids our bodies need, just like the United Nations recommends. Moreover, pea protein has excellent functional properties such as solubility, water, and oil holding capacity, emulsion ability, gelation, and viscosity.

**Results:** Therefore, these functional and nutritional properties make pea protein a promising ingredient in the food industry.

**Conclusion:** Finally, this study shows that pea proteins are a good, healthy, and eco-friendly choice for our diets, addressing the need for more protein in the world while being mindful of the environment.

**Keywords:** Pea protein, amino acids, diet, nutritional value



## ROLE OF NUTRIGENOMICS IN OBESITY CONTROL: A SYSTEMATIC REVIEW

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**Background and Aim:** Nutrigenomics is a branch of nutritional genetics, which is defined as the study of the effect of nutrients on gene expression and, therefore, on possible changes in metabolic pathways. In 40-70% of obesity cases, the genetic cause is involved, because genes affect the way fat is absorbed, metabolized and stored in the body of persons. This review will survey the latest evidence on the role of nutrigenomics in obesity control.

**Methods:** The Number of 31 published literature was searched using the PubMed, Google Scholar, Scopus, ProQuest database with the search terms Nutrigenomics and obesity ' until 2024

**Results:** In the test to determine genes related to weight fitness, certain genetic differences known as "Single Nucleotide Polymorphism (SNP)" are investigated. Each SNP represents a specific location of the genome where the arrangement of a particular nucleotide in an individual may differ from what is common in the majority of the population. 39% of adults in the world experience overweight and obesity. Sometimes, despite the diets, the person suffers from obesity, because according to the research, due to the difference in the genome of people, it is not possible to use a single regimen for all people, because different people's bodies show different reactions to a single food. In these cases, with the help of nutrigenomics, it is possible to conclude what kind of diet is suitable based on the genetic profile of each person.

**Conclusion:** Nutrigenomics examines the effects of a certain diet on people's health based on changes in genes

**Keywords:** Nutrigenomics. Obesity. SNP



## THE READINESS OF IRANIAN LOCAL COMMUNITIES TO ENGAGE IN CHILDHOOD OBESITY PREVENTION PROGRAMS: A THEORY-BASED INTERVENTION

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**Background and Aim:** In designing community-based programs, measuring community readiness (CR) identifies how a community can address an issue of interest. A readiness assessment helps guide goals and prevention strategies to motivate and mobilize the community to a higher level of readiness. Accordingly, exploring changes in CR provides a framework to inform planners about the effectiveness of an intervention. Improving community readiness for addressing childhood obesity is a promising approach to reduce the issue. This study focuses on the fifth phase of a multilevel, multisector, theory-based study entitled Community Readiness Improvement for Tackling Childhood Obesity (CRITCO) to explore pre- and post-community readiness for engaging in childhood obesity prevention programs of late primary school children (students in grades 4 to 6) in Iran.

**Methods:** The CRITCO study was launched and implemented over two years (August 2018 to August 2020) in five distinct phases, where each phase developed based on the findings of the previous phases: The first two phases developed a validated socio-culturally adapted Persian version of the community readiness tool (CRT). Subsequently, a cross-sectional study determined the readiness of 12 local communities from two diverse socioeconomic districts of Tehran city (districts 2 and 16). The fourth phase developed an intervention package based on the readiness level data and environmental scan. In the fifth phase, the effectiveness of an evidence-based quasi-experimental intervention was determined by exploring changes in the readiness of intervention and non-intervention local communities. Interventions were located in eight local communities (four interventions; four comparisons) from two diverse socio-economic districts of Tehran, Districts 2 and 16. The Food and Nutrition Committees (FNCs) were established in each intervention community to make collaborative efforts among different sectors and assess the fidelity of the intervention. Pre-interviews with the key informant's representative sample (46 interviews:





22 interventions; 24 comparisons) were conducted and post-interviews were conducted after a seven-month intervention. Aligned strategies and activities with baseline readiness data were developed. Interviews were analyzed using the community readiness model (CRM) scoring protocol and qualitative methods. The Repeated Measure Analysis, Independent t-test, and Analysis of Variance (ANOVA) were used for cross-sectional comparisons between intervention and non-intervention groups at baseline and follow-up. Qualitative content analysis of interview data was performed by MAXQDA 2010. Results: The total readiness of intervention sites increased by 0.48 units ( $p < 0.001$ ) and shifted to the next higher level, from preplanning (fourth stage) to the preparation stage (fifth stage). At the same time, the readiness of control communities decreased by 0.39 units ( $p < 0.001$ ), although their readiness stage remained unchanged, reflecting the fourth stage. Also, a sex-dependent CR change was observed, such that the girls' schools showed a more remarkable improvement in interventions and less decline in controls. The readiness stages of interventions significantly improved for four dimensions related to community efforts, knowledge of the efforts, knowledge of childhood obesity issue, and leadership. Furthermore, the readiness of control communities significantly decreased on three of six dimensions related to community effort, knowledge of efforts, and resources.

**Conclusion:** The CRITCO successfully improved the readiness of intervention sites for addressing childhood obesity. The participatory efforts were made possible by engaging the community leaders, establishing FNCs, and making participatory efforts. It is hoped that the present study can be a spark for developing readiness-based childhood obesity prevention programs in Middle Eastern and other developing countries.

**Keywords:** Childhood Obesity, Prevention program, Community readiness, Local communities, intervention



## OBESITY, CAUSES AND CONSEQUENCES; WHAT WE LEARNED FROM RANCD COHORT STUDY

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**Background and Aim:** Obesity is a medical condition involving an excessive amount of body fat that increases the risk of non-communicable diseases (NCDs) such as cardiovascular diseases (CVDs) and diabetes. Life style and dietary modification is an appropriate approach to reducing this phenomenon. Although little information is known about it in the Kurdish population. The aim of this study was to report of the prevalence of obesity and abdominal obesity, their causes and consequences among Kurdish adults.

**Methods:** This study was applied data from baseline phase of Ravansar non-communicable diseases (RaNCD) cohort study. Obesity and abdominal obesity were defined using body mass index (BMI) > 30 kg/m<sup>2</sup> and based on the International Diabetes Federation (IDF) criteria, respectively. Dietary intake was assessed by the food frequency questionnaire. Binary logistic regression odds ratios (OR) and 95% confidence intervals (CI) were used to determine association between obesity and NCDs. The structural equation modeling was used to study the direct and indirect effects of risk factors on overweight and obesity.

**Conclusion:** Based on the BMI, 43.35% of the participants had overweight and 26.91% of them were obese. 79.37% had abdominal obesity (61.3% of men and 95.5% women). We found that higher adherence to healthy eating pattern was associated with lower odds for obesity and abdominal obesity (OR: 0.67; CI 95%: 0.58-0.78) and (OR: 0.87; CI 95%: 0.76-0.98), respectively. Obesity was significantly associated with higher odds for CVDs (OR: 1.42), diabetes (OR: 1.71), and hypertension (OR: 1.59). The direct effect of socioeconomic status (SES) on overweight and obesity was -0.070, the indirect effect was 0.127, and the total effect was 0.057. The indirect effect through three variables such as physical activity, dietary pattern, and smoking status, on the outcome. This study indicated high prevalence obesity in Kurdish population especially abdominal obesity in women. Factors associated with overweight and obesity not only by direct effect, but also can indirectly and through mediators (such as dietary pattern and physical activity as two important mediating variables) cause this outcome. Lack of physical activity, unhealthy dietary patterns, and smoking could develop overweight and obesity.

**Keywords:** obesity; abdominal obesity; healthy eating index; Kurdish adults



## **BODY MASS INDEX (BMI) AND COVID-19 MORTALITY: A REVIEW STUDY BASED ON IRANIAN FINDINGS**

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**Background and Aim:** The coronavirus disease 2019 (COVID-19) pandemic presents an outbreak health emergency to the whole world. As reported, the body mass index (BMI) may play a key role in COVID-19 mortality; though, this still remains unclear. Some observational studies have shown that COVID-19 is more common in countries with a high prevalence of obesity and those people with COVID-19 have an upper body mass index as well as higher rate of severity and death. This study aimed to review the evidence on body mass index and COVID-19 mortality rate from Iranian research studies.

**Methods:** The method used for this study included searching The Medline, PubMed, Scopus, google scholar Embase and Web of science for the link between body mass index and COVID-19 mortality among Iranian original research studies between years 2020 to 2023. Totally, 58 articles were found. The English and Persian free full-text article from 16 articles were included in this study.

**Results:** All 16 Iranian origin articles on risk factors, disease severity, and mortality from COVID-19 disease were studied. Findings demonstrated a linear dose-response association between BMI and COVID-19 severity. Obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) and underweight (BMI  $< 18.5$  kg/m<sup>2</sup>) were associated with significantly increased risk of COVID-19 mortality among Iranian population.

**Conclusion:** Findings suggest that the excess body weight may be considered as an important risk factor for mortality of COVID-19 disease. Treatment of overweight and obesity and long-term preventive strategies possibly help to reduce the severity of COVID-19 outcome.

**Keywords:** BMI; COVID-19; Mortality; Nutrition; Obesity



## MEGADOS MICRONUTRIENT SUPPLEMENTATION AND COVID-19 DISEASE: A REVIEW

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**Background and Aim:** Micronutrients play roles in strengthening and maintaining immune function, but their supplementation effects on COVID-19 are inconclusive. This review aims to explore the protective effect of megadose micronutrient supplementation on coronavirus severity and the length of hospital stay.

**Methods:** The method used for this study included searching The Medline, PubMed, Google Scholar, Embase and Web of science for the link between dietary supplement and COVID-19 among research studies between years 2020 to 2023. Totally, 31 articles were found. The English free full-text article from 18 articles were included in this study.

**Results:** All 18 articles were studied. Full-text articles on effect of mega dose of four dietary supplements including vitamin C, Vitamin D, Vitamin A and zinc on COVID-19 outcome mortality and length of hospital stay were investigated. Among all micronutrient supplementations, only megadose (50,000 IU) of vitamin D demonstrated a protective effect on COVID-19 recovery period but had no significant effect on disease mortality.

**Conclusion:** To justify the beneficial impacts of micronutrients supplementation in modulating the immunity against COVID-19, further experimental and clinical trials in this field is needed to be studied.

**Keywords:** COVID-19, MICRONUTRIENT, VITAMIN D, SUPPLEMENT, NUTRITION



## ASSOCIATION BETWEEN CARBONATED BEVERAGES CONSUMPTION AND HEALTH-RELATED POOR QUALITY OF LIFE: CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Quality of life (QOL) is a key concept in health and medicine that has many dimensions. Carbonated beverages are a food group that may affect health-related QOL negatively. However, the link between carbonated beverages intake and QOL is unclear. This study explored this question.

**Methods:** This cross-sectional study involved 604 Iranian adults aged 18-65 from various regions. We measured health-related QOL using the Short-Form 12-Item Survey-version 2 (SF-12v2), a validated questionnaire. We assessed carbonated beverage intake using a food frequency questionnaire (FFQ). We used logistic regression analysis in both unadjusted and adjusted models to examine the association between carbonated beverages intake and poor QOL.

**Results:** Carbonated beverages intake was not significantly associated with poor QOL in the crude model (OR: 1.126; 95% CI: 0.723-1.753; P= 0.601). This association remained non significant after adjusting for age, gender, smoking, Body mass index (BMI), and energy intake (OR: 1.217; 95% CI: 0.751-1.974; P=0.425).

**Conclusion:** This study found no significant link between carbonated beverages intake and poor QOL. More studies are needed.

**Keywords:** Quality of life, Carbonated beverages, Food group, Iran



## ASSOCIATION BETWEEN CARBONATED DRINK AND STRESS: FINDINGS FROM A POPULATION-BASED CROSS-SECTIONAL STUDY

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**Background and Aim:** Stress is the trigger or aggravator of many diseases and pathogenic conditions. Due to the high consumption of carbonated drinks around the world, the scientific community has increased its focus on their health effects. The aim of this study was to investigate the relationship between the consumption of carbonated drinks and stress.

**Methods:** This cross-sectional study involved 604 participants from different regions of Iran, aged 18 to 65 years old. We collected dietary data using a semi-quantitative food frequency questionnaire (FFQ) with 168 food items and measured stress using the DASS-21 (Depression Anxiety and Stress Scale 21) questionnaire. To investigate the relationship between stress and carbonated drinks, we used logistic regression analysis in crude and adjusted models.

**Results:** There was no significant association between intake of carbonated drinks and stress (OR = 0.920; 95% CI = 0.508 - 1.668; P-value = 0.783) in the crude model. This association remained not significant after adjusting for potential confounding variables, such as age, gender, BMI (Body Mass Index), smoking, and energy intake.

**Conclusion:** This study found no significant evidence to support the association between carbonated drinks and stress. Further studies are needed to investigate these findings.

**Keywords:** Stress; carbonated drinks; cross-sectional; IRAN



## IMPACT OF FOLIC ACID SUPPLEMENTATION ON BLOOD PRESSURE IN HUMANS: A SYSTEMATIC REVIEW AND META-REGRESSION ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Many clinical trial studies have shown that folic acid improves plasma homocysteine and vascular endothelial levels, thereby reducing blood pressure (BP). However, the findings regarding the effects of folic acid supplementation on BP are still contradictory. The aim of this systematic and meta-analysis study was to investigate the effects of folic acid supplementation on BP using randomized controlled trials (RCTs)

**Methods:** Available databases including PubMed/Medline, Web of Science, Scopus, Cochrane Library, and Embase were searched to find relevant RCTs up to June 2021. Effect size was expressed as weighed mean difference (WMD) and 95% confidence interval (CI).

**Results:** 20 RCT studies (21 treatment arms) with 33,182 participants were included in this article. Findings suggested that folic acid supplementation significantly reduced systolic (SBP: WMD - 2.30 mmHg; 95% CI - 3.85 to - 0.74, P=0.004) and diastolic (DBP: WMD - 0.88 mmHg; 95% CI - 1.38 to - 0.39, P=0.001) blood pressure compared to the control group. In addition, the results of the subgroup analysis showed that the reduction of SBP and DBP is more effective in subjects >50 years old, and also with a folic acid dosage of ≤ 5 mg per day. However, folic acid supplementation during the intervention ≤ 6 weeks and >6 weeks caused a further decrease in SBP and DBP, respectively.

**Conclusion:** This meta-analysis showed that folic acid significantly improved SBP and DBP. However, further studies are needed to confirm the findings.

**Keywords:** Meta-analysis, folic acid supplements, blood pressure, vascular endothelial



## EFFECTS OF NANO-CURCUMIN ON CARDIOVASCULAR DISEASES (CVDS) RISK FACTORS IN PEOPLE WITH NON-ALCOHOLIC FATTY LIVER DISEASE: A SYSTEMATIC REVIEW

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**Background and Aim:** Cardiovascular disease(CVD)is the leading cause of death in patients with nonalcoholic fatty liver disease(NAFLD).Cardiovascular disease(CVD)is the main cause of death in patients with non-alcoholic fatty liver disease(NAFLD).The aim of this study is to investigate the effect of nano curcumin supplementation in modulating cardiovascular disease risk factors and improving non-alcoholic fatty liver disease.

**Methods:** This systematic review study in2023with advanced search in valid databases including PubMed,Web of science,Scopus and Google scholar search engine using related keywords and their Mesh terms, all articles published in the period of 2013-2023 with inclusion criteria(only studies in English language,only human studies,without restriction of access to full text,clinical trial studies,cross-sectional studies,case-control studies) and exclusion criteria(review articles of systematic articles and meta-analysis,low-quality and repeated articles)it placed.

**Results:** From 123primary articles,8randomized clinical trials and7observational studies were selected.The results showed that nanocurcumin can improve some risk factors of heart diseases and non-alcoholic fatty liver disease.These factors include:bloodpressure,-improved blood glycemic profile,improved lipid profile,inflammatorymarkers,oxidative-markers,liver fibrosis markers,liver size and fat, and health-related quality of life.But the effect of nanocurcumin on some other factors such as:bodyweight,body mass index,abdominalfat,livermarkers,kidneymarkers,homeostasismarkers,and cancer markers was not clear.

**Conclusion:** This study shows that nano curcumin can be a useful food supplement for the treatment and prevention of heart diseases and non-alcoholic fatty liver disease. However,due to the small number of studies, variation in dosage and duration of use,there is a need for more and higher quality studies.

**Keywords:** Nano-curcumin, Curcumin, Cardiovasculardiseas, Nafld, non-alcoholic fatty liver disease





## THE EFFECT OF SELENIUM SUPPLEMENTATION ON THE PERFORMANCE OF RESISTANCE ATHLETES :A SYSTEMATIC REVIEW

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**Background and Aim:** Selenium plays an important role in the health of the immune system, thyroid, antioxidant production and protection of cells against oxidative stress. Some studies have shown that selenium can be useful for improving sports performance, muscle recovery and reducing muscle pain. The purpose of this systematic review article is to examine the available evidence on the effect of selenium supplementation on recovery and reducing muscle pain and improving sports performance.

**Methods:** This systematic review in 2023 by advanced search in authoritative databases including PubMed, Web of Science, Scopus and Google Scholar search engine using relevant keywords and their mesh terms, all articles published in the period 2013-2023, criteria Inclusion included (English-language articles, performed on humans, having a control group) and exclusion criteria (review articles, cases, meta-analysis, patients, subjects with selenium deficiency) were included.

**Results:** 7 articles related to the goal were included in the review. These articles included 139 participants (72 supplement users and 67 placebo users). The amount of selenium supplement used in these articles was between 200 and 2000 micrograms per day and the duration of use was between 4 and 16 weeks. The results showed that selenium supplementation can have a positive effect on some indicators of sports strength such as explosive strength, isometric strength and isokinetic strength. But some studies showed that taking selenium supplements had no significant effect on muscle mass, recovery and muscle pain.

**Conclusion:** This review shows that selenium supplementation can be beneficial for recovery and reduction of muscle soreness and improvement of athletic performance. However, due to the small number of studies, variation in the dose and duration of selenium supplementation, heterogeneity in the assessed risk factors and the variable quality of the articles, we need more and higher quality studies

**Keywords:** Selenium supplement, muscle recovery, reducing muscle pain, improving sports performance, resistance athletes



## DIETARY PATTERNS AND FUNCTIONAL DYSPEPSIA: A SYSTEMATIC REVIEW

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**Background and Aim:** Dietary patterns (DPs) may play important roles in functional dyspepsia (FD), which is one of the widely prevalent FGIDs. This systematic review was performed to summarize existing literature in the associations of DPs (i.e., DASH diet, Mediterranean diet, Vegetarian diet) with dyspeptic symptoms in healthy adults.

**Methods:** A comprehensive literature search was conducted in online databases including up to March 2023. All studies investigated the association between different DPs and FD symptoms were eligible for this systematic review.

**Results:** A total of 7 studies (3 RCTs and 4 cross-sectional) were enrolled in the present systematic review. DASH diet significantly increased the risk of dyspeptic symptoms, specifically bloating. High amounts of whole grain in the DASH diet (wheat and gluten) were associated with the generation of post-prandial distress syndrome (PDS) and epigastric pain syndrome (EPS). Mediterranean diet (MD) had a positive effect on alleviating dyspeptic symptoms. But certain MD foods (e.g., cantaloupe, grapefruit, oranges, and tangerines) were associated with higher abdominal pain and bloating. Sense of fullness, bloating, and nausea decreased significantly after transitioning to a vegetarian diet. High consumption of fruit in women, and both fruit and vegetable in men was related to a lower odd of post-prandial fullness.

**Conclusion:** There is limited evidence on the associations between DPs and FD, with mixed findings. Future intervention studies are needed before transferring any of the available data into clinical practice.

**Keywords:** "Functional Dyspepsia ; Dietary Patterns ; Fullness ; Bloating ; Pain "



## ASSOCIATION OF INTRADIALYTIC HYPERTENSION AND DIETARY ELEMENTS: A CASE- CONTROL STUDY

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**Background and Aim:** Intradialytic hypertension (IDH) is defined as a rise in blood pressure during or immediately after hemodialysis that is associated with increased mortality in these patients. This study aimed to evaluate the association between IDH and the nutritional intake of trace and micromineral elements in maintenance hemodialysis patients.

**Methods:** Patients with chronic renal failure treated with maintenance hemodialysis were assessed in this case- control study. The subjects who had intradialytic hypertension were selected as the case group. The Food Frequency Questionnaire (FFQ) was used to collect nutritional data; then, the diets of the two groups were analyzed. 23 patients with IDH and 23 without IDH were included in the analysis.

**Results:** Although there was no significant difference in daily calorie intake between the two groups, the mean dietary intake of sodium, calcium, phosphorus, and total fat was significantly higher in the IDH group than the control group ( $p$ -value  $<0.05$ ). In the group with IDH, the phosphorus intake was higher than the recommended amount, while the control group consumed significantly less oral phosphorus.

**Conclusion:** In conclusion, advising limiting oral phosphorus and sodium consumption along with low-fat diet may help to reduce blood pressure in the IDH patients and subsequent mortality.

**Keywords:** Hemodialysis, Dietary intake, Trace elements, Hypertension



## COMPARISON BETWEEN PROTECTIVE EFFECTS OF RESVERATROL AND ATORVASTATIN AGAINST ATHEROGENIC DYSLIPIDEMIA IN RATS

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**Background and Aim:** In the present study, the protective effects of RVL and atorvastatin (ATV) in rats fed with a high-fat/high-fructose diet were compared that aimed to introduce a safer medication than statins for the treatment of atherogenic dyslipidemia and preventing risks of cardiovascular mortality.

**Methods:** Thirty-six adult male Sprague Dawley rats were divided into 4 groups, including a group that was fed with a standard (STD) diet and three groups that were fed with a high-fat/high-fructose diet (HFHF) for 12 weeks. In two groups, in addition to the HFHF diet, animals received RVL (100 mg/kg) and ATV (10 mg/kg) by gavage. After 12 weeks, levels of body and heart weights, systolic blood pressure, serum biomarkers of atherogenic dyslipidemia, homeostasis model of assessment-insulin resistance (HOMA-IR), and MDA in the heart tissue were measured.

**Results:** After 12 weeks, the animals that received the HFHF diet had an elevation ( $p < 0.05$ ) in body weight, heart weight, systolic blood pressure, serum total triglycerides (T-TGs), total cholesterol (T-CHOL), LDL, HOMA-IR, AST, and TNF- $\alpha$ . The administration of RVL statistically reduced ( $p < 0.05$ ) heart weight, BP, serum TGs levels, HOMA-IR, and serum levels of TNF- $\alpha$  in rats who received the HFHF diet. MDA content was elevated in the heart tissue of the HFHF group but administration of RVL reduced it ( $p < 0.05$ ). Meanwhile, administration of ATV significantly reduced ( $p < 0.05$ ) heart-weight, serum levels, T-TGs, T-CHOL, LDL, and TNF- $\alpha$ .

**Conclusion:** RVL has better protective effects than ATV in rats who received the HFHF diet.

**Keywords:** Dyslipidemias, Resveratrol, Atorvastatin, Rats.



## THE EFFECT OF FLAXSEED ON NAFLD

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**Background and Aim:** Fat accumulation in the liver (hepatic steatosis) from non-alcoholic is called Non-alcoholic fatty liver disease (NAFLD). NAFLD is a growing global issue affecting 1.80 billion people, with no approved pharmacological approaches yet found. Lifestyle changes and diet have accelerated obesity and metabolic syndrome, leading to a higher incidence of NAFLD. Around 25% of the global population suffers from chronic liver diseases. High intake of dietary fat, particularly saturated fatty acids, is associated with liver inflammation and NAFLD. Flaxseed, a rich source of lignans, contains high amounts of  $\omega$ -3 PUFA, which have hepatoprotective properties and prevent oxidative stress and liver inflammation. Flaxseed can be a promising adjunct intervention for weight loss and reducing the risk of weight-related metabolic abnormalities like dyslipidemia, insulin resistance, and cardiovascular risk factors. This review aims to evaluate the effect of flaxseed on NAFLD.

**Methods:** Electronic search contains Flaxseed, nonalcoholic fatty liver disease, fatty liver grade, weight, liver enzymes, lipid profile were searched in databases including PubMed, Medline and Google Scholar

**Results:** Flaxseed is found to regulate liver enzymes and weight gain, with limited research on its effects on non-alcoholic fatty liver disease (NAFLD). Existing studies show improved lipid profiles (LDL-C, HDL-C, Cholesterol, TG), liver enzymes, reduced food intake, and even reduced body fat.

**Conclusion:** Overall, Flaxseed attenuated the hepatic inflammation, fibrosis via different mechanisms and affecting lipid profile but due to the limited number of studies in this field further studies are need

**Keywords:** Flaxseed, NAFLD, lipid profile



## INVESTIGATION OF THE EFFECT OF NANO-CURCUMIN SUPPLEMENT ON SERUM ADIPONECTIN IN OVERWEIGHT AND OBESE PATIENTS WITH CORONARY SLOW FLOW PHENOMENON

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**Background and Aim:** Coronary slow flow phenomenon (CSFP) is a condition with delayed passage of blood to the coronary tree without significant coronary stenosis. CSFP causes recurrent chest pains and poor quality of life. Inflammation and reduced adiponectin levels may play a role in CSFP pathogenesis. Turmeric, as a medical herb and ingredient, contains a bioactive compound called curcumin which has anti-inflammatory effects. Thus, we investigated the effect of nano-curcumin, with increased absorption rate, on serum adiponectin levels in CSFP patients.

**Methods:** 42 patients with CSFP diagnosis and body mass index (BMI) ranging from  $25 \leq$  to  $< 40$  kg/m<sup>2</sup> were randomized into two groups. They received either placebo or 80 milligram nano-curcumin capsule per day for 12 weeks. Both participants and investigators were blinded to the study groups. Patients were instructed to keep their usual physical activity level and diet, and their ongoing medical treatments during the study. Before and after the intervention, the participants' BMI and weight as well as serum adiponectin concentrations (by ELISA kit) were assessed.

**Results:** No significant differences in mean changes of serum adiponectin levels were detected between nano-curcumin ( $-1.6 \pm 4.5$  µg/L) vs placebo group ( $-3.1 \pm 10.8$  µg/L) ( $P: 1.00$ ) during the study. Likewise, there were no significant differences in mean changes of BMI ( $P: 0.485$ ) and weight ( $P: 0.432$ ) between the two study groups in this trial.

**Conclusion:** Although serum adiponectin is reduced in CSFP, its serum concentrations didn't improve in response to 80 mg/day nano-curcumin supplementation for 12 weeks. Further researches are needed to explore the potential treatments in these patients.

**Keywords:** Coronary slow flow phenomenon; Nano-curcumin; Adiponectin



## THE USE OF THE EXTENDED THEORY OF REASONED ACTION IN PREDICTING OF GLYCEMIC CONTROL AMONG PATIENTS WITH TYPE 2 DIABETES

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**Background and Aim:** HbA1c level is one of the most important clinical factors of glyce-mic control in patients with diabetes. Hence, this research aimed to use of the Extended Theory of Reasoned Action in predicting of glyce-mic control among patients with type 2 diabetes in Iran.

**Methods:** This cross-sectional study was conducted using a multistage random sample. A total of 240 patients with type 2 diabetes, who were referred to the diabetes healthcare centers in Chaldoran, Iran, participated in the research. Instruments consisting of stan-dardized questionnaires were used based on the Extended Theory of Reasoned Action (ETRA) constructs and the summary scale of diabetes self-care behaviors measure.

**Results:** According to the results of this study, demographic factors including age, level of education, duration of disease and monthly income had significant correlation with HbA1c level. Using Pearson's correlation coefficient, it was found that HbA1c level had a statistically significant positive correlation with knowledge ( $r = 0.563$ ), attitude ( $r = 0.404$ ), self-efficacy ( $r = 0.348$ ), behavioral intention ( $r = 0.365$ ), and self-care behav-iors ( $r = 0.731$ ), while subjective norms had no significant association ( $r = -0.083$ ). The results of hierarchical multiple linear regressions demonstrated the ETRA constructs, self-care practices, and demographic factors together account for almost 57% of the variation in the HbA1c. Self-care practices were the best indicator of HbA1c ( $\beta = -0.593$ ).

**Conclusion:** Self-care behaviors and ETRA constructs can be the best determinants of HbA1c level in type 2 diabetes. This model is suggested to be applied in designing inter-vention programs to improve HbA1c in these groups of patients.

**Keywords:** HbA1c; Extended Theory of Reasoned Action; Type 2 diabetes; Iran



## THE EFFECT OF WHOLE POMEGRANATE JUICE (PUNICA GRANATUM) ON NUTRITIONAL-IMMUNOLOGICAL STATUS IN HOSPITALIZED COVID-19 PATIENTS: AN EXPLORATORY RANDOMIZED DOUBLE-BLIND CLINICAL TRIAL

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**Background and Aim:** This study set out to explore the nutritional-immunological effects of pomegranate juice on hospitalized COVID-19 patients.

**Methods:** We conducted this study as an exploratory randomized clinical trial recruiting 48 COVID-19 patients. Subjects were randomly allocated to intervention and placebo groups. Intervention participants received 500 ml whole pomegranate juice as a complementary therapy, and control patients received the same amount of placebo for 2 weeks. CONUT, PNI & AGR scores were measured at baseline and the end of the trial.

**Results:** 43 patients completed the study. Cholesterol significantly decreased ( $P<0.0001$ ), and albumin ( $P<0.0001$ ), total protein ( $P=0.03$ ) and lymphocytes ( $P=0.04$ ) significantly increased in the PJ group. However, the result remained insignificant regarding CONUT, PNI, and AGR.

**Conclusion:** Our intervention showed that pomegranate juice had no significant effect on nutritional-immunological indicators, including CONUT, PNI and AGR scores. However, it did significantly reduce cholesterol levels and increase albumin, total protein and lymphocyte counts. Further studies are needed to determine the long-term effects of pomegranate juice consumption on nutritional-immunological indicators and overall health outcomes.

**Keywords:** Pomegranate, COVID-19, Randomized Controlled Trial, Complementary Therapies, Biomarkers





## THE EFFECTS OF GRAPE SEED EXTRACT SUPPLEMENTATION ON CARDIOVASCULAR RISK FACTORS, OXIDATIVE STRESS AND QUALITY OF LIFE IN PATIENTS WITH NON-ALCOHOLIC FATTY LIVER DISEASE: A RANDOMISED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY

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**Background and Aim:** This study aimed to investigate whether GSE could influence cardiovascular risk factors, oxidative stress, and quality of life (QoL) in NAFLD patients.

**Methods:** A double-blind, randomized clinical trial was conducted, involving 50 NAFLD patients. The patients were divided into two groups consisting of 25 patients each: one group receiving 2 capsules (260 mg) daily containing GSE and the other receiving 2 capsules (260 mg) of placebo daily (containing cellulose and starch) for two months. The levels of glycemic parameters, lipid profile, and oxidative stress (TAC, MDA, SOD, GPx, CAT, IL-6) were measured before and after the intervention. The patients' QoL was also assessed using the SF-36 questionnaire.

**Results:** After two months, significant reductions in insulin, HOMA-IR, TC, TG, LDL-c, ALT, AST, and AST/ALT levels, and increases in QUICKi and HDL-c levels were observed. Changes in insulin, HOMA-IR, TC, TG, and LDL-c were more pronounced in the GSE group, and HDL-c changes were significantly higher in this group ( $p < 0.05$ ). Furthermore, the changes in QUICKi after baseline adjustment were more significant in the GSE group than in the control group ( $p < 0.05$ ). Additionally, the GSE group experienced significant decreases in IL-6 and MDA, and increases in TAC, SOD, and GPx compared to the baseline values. QoL results indicated significant improvements in physical limitations, mental and physical health with GSE intervention ( $p < 0.05$ ).

**Conclusion:** The study concluded that GSE could effectively control insulin resistance, hyperlipidemia, oxidative stress, and QoL in NAFLD patients.

**Keywords:** Grape Seed Extract, Non-Alcoholic Fatty Liver Disease, Hyperlipidemia, Hyperglycemia, Hypertension



## THE EFFECT OF DIET THERAPY AND PHYSICAL ACTIVITY BASED ON IRANIAN TRADITIONAL MEDICINE ON ANTHROPOMETRIC INDICATORS, LIPID PROFILE AND INSULIN RESISTANCE IN OBESE PEOPLE.

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**Background and Aim:** In some sources of Iranian traditional medicine, there are solutions for obesity treatment. In this study, the effect of combining it with diet therapy on the treatment of obesity was investigated.

**Methods:** In this study, 60 obese patients were included in two intervention and control groups. In the intervention group, a low-calorie diet (500 KCAL less than the daily requirement) with an emphasis on the principles of traditional Iranian medicine. The control group had only the usual low-calorie diet and daily activity.

**Results:** after 2 months, comparing the two groups, the average weight loss ( $-4.9 \pm 0.2$  vs.  $-3.7 \pm 0.3$ ), decrease in body fat percentage ( $-6.7 \pm 1.3$  vs.  $(-5.5 \pm 1.4)$ ), the reduction of insulin resistance ( $-1.9 \pm 0.6$  against  $-1.1 \pm 0.9$ ) in the intervention group was significantly more than the control ( $P < 0.05$ ). There were no significant changes in fasting blood sugar and lipid profile in the intervention group compared to the control group. But when comparing the changes compared to the beginning of the study, there was a significant decrease in weight, body fat percentage, fasting blood sugar and triglyceride in both groups compared to the beginning of the study ( $P < 0.05$ ).

**Conclusion:** When weight loss diet and physical activity are used along with the scientific recommendations of Iranian traditional medicine, it can have better results in weight loss, body fat mass and insulin resistance.

**Keywords:** obesity, Iranian traditional medicine, lipid profile, weight



## COMPLEMENTARY EFFECT OF FISH OIL IN WEIGHT LOSS OF OVERWEIGHT AND OBESE INDIVIDUAL. A SYSTEMATIC REVIEW AND META-ANALYSIS STUDY

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**Background and Aim:** This systematic review and meta-analysis on randomized controlled trials (RCTs) evaluated the impact of EPA (Eicosapentaenoic Acid) and DHA (Docosahexaenoic Acid) in weight loss of overweight and obese individual. We conducted a thorough search of the data available in the citation database.

**Methods:** Of these 638 people who were investigated in these studies, it was found that the consumption of omega-3 supplements compared to placebo was associated with a reduction of 1.27 kg of body weight, although this weight loss was not statistically significant (95%CI -3.58, -10.04).

**Results:** Duration of studies that was more than 10 weeks, was a non-significant decrease in weight (MD = -2.47; 95 %CI:  $\pm$  0.65, 1.27), (MD = -2.47; 95 %CI:  $\pm$  0.65, 1.27), while heterogeneity between studies was significant ( $I^2 = 0.88$ ,  $P \leq 0.001\%$ ). Duration of studies that lasted less than 10 weeks, no weight loss was observed (Fig .5), also, heterogeneity was not seen in the studies (MD = 0.66; 95 %CI:  $\pm$  1.6, 1.49) ( $I^2 = 0$ ,  $P = 0.77\%$ ).

**Conclusion:** Therefore, it seems that omega-3 supplement is not a suitable solution for weight loss.

**Keywords:** EPA;DHA;Weight loss;Randomized controlled trials;analysis;fish oil.



## EFFECT OF MYO-INOSITOL (MI) SUPPLEMENTATION ON ANTHROPOMETRIC FACTORS, DAAT, FOOD INTAKE, AND APPETITE IN NON-ALCOHOLIC FATTY LIVER PATIENTS (NAFLD)

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**Background and Aim:** The prevalence of obesity has become a significant global health concern, which is closely linked to chronic diseases, including non-alcoholic fatty liver disease (NAFLD). Abdominal obesity is linked to these conditions and can be affected by dietary intake. Deep abdominal adipose tissue (DAAT) is a key factor in the development of NAFLD. DAAT is a type of visceral fat that accumulates around the organs in the abdominal cavity. Myo-inositol (MI) is a carbocyclic sugar polyalcohol. This study aimed to investigate the effects of MI supplementation on obesity factors, particularly DAAT, obese patients with NAFLD.

**Methods:** In this double-blind placebo-controlled randomized clinical trial, 48 patients with NAFLD were randomly assigned to receive either MI (4g/day) or placebo by dietary recommendations for 8 weeks. To evaluate patients' appetite, they were questioned using a validated survey. In addition, their dietary intake was measured through a 3-day food recall. The nutritional status and obesity indices were assessed pre- and post-intervention. The trial protocol was approved by the Iranian Clinical Trials Registration (IRCT20100209003320N2).

**Results:** Although weight, BMI (Body mass index), WC (Waist circumference), HC (hip circumference), and WHtR (waist-to-height ratio) decreased significantly in both groups, a greater decrease was observed in the MI group. After calculating DAAT using the formula, a decrease was seen in both groups, especially in the MI group, but this decrease was not significant. Regarding appetite factors and dietary intakes between-group differences were non-significant by the end of the study.

**Conclusion:** MI supplementation could improve some obesity indices in patients with NAFLD. Further clinical trials with larger sample sizes and longer durations are encouraged to study the different doses of MI and other inositol derivatives in patients with NAFLD.

**Keywords:** Myo-Inositol (MI), Deep abdominal adipose tissue (DAAT), Non-alcoholic fatty liver disease (NAFLD).



## THE EFFECTS OF OKRA AND SPINACH ON BLOOD GLUCOSE, LIPID PROFILE AND ANTHROPOMETRIC MEASUREMENTS IN DIABETIC WOMEN WITH BMI $\geq 25$

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**Background and Aim:** Diabetes mellitus is a group of metabolic disorders characterized by a high blood. We investigated the impact of okra seeds and spinach on blood glucose in overweight/obese women.

**Methods:** 48 women suffering of the type-2 debate, aged 25–65 years, BMI  $\geq 25$ . At each meal, patients consumed one capsule (2 gram) of okra seed powder and 5g/d spinach half-hour before breakfast for 90 days. In this study, blood samples were taken five times.

**Results:** The first sampling was carried out at the beginning of the research as control. Other samples were performed as after on first day, second day, thirtieth day and ninety day after the intervention by spinach and okra seeds. The values of FBG, BG2h, HbA1C, LDL, HDL, TG and Anthropometric measures was measured. FBG levels decreased in all the days comparison with the first day ( $P < 0.05$ ). HbA1C plasma concentration decreased after ninety day comparison with the first day and the mean for the before and after treatment were respectively (Before: 9.3mg/dl. After: 8.4mg/dl). Results showed okra seeds and spinach had significant role in reducing the amount of LDL and TG during period of three months, however okra seeds and spinach had not role in reducing HDL.

**Conclusion:** Data indicates that a single meal of okra seeds for dinner and spinach before of breakfast reduced blood glucose levels in diabetic overweight/obese women effectively. These data suggest that the okra seeds and spinach had synergic effects in reducing blood glucose levels.

**Keywords:** Okra, Spinach, lipid profile, Anthropometric measures, diabetes



## ASSOCIATIONS BETWEEN SALT CONSUMPTION AND DEPRESSION AND ANXIETY IN MIDDLEAGED ADULTS: A LARGE CROSSECTIONAL ANALYSIS AMONG IRANIAN MANUFACTURING EMPLOYEES

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**Background and Aim:** This cross-sectional study was performed among 16,000 Iranian employees in steel mill company in 2015 to assess lifestyle factors as well as individual, familial, occupational and socioeconomical characteristics of the participants. Using a semi-quantitative food frequency questionnaire, dietary intakes of participants were assessed.

**Methods:** All formal and contractual employees who had at least 1 year of work experience in Isfahan Steel Mill Company were included in our study. Participants were selected using a multistage random cluster sampling method.

**Results:** In this study found a significant relationship was observed between high salt consumption and depression (odds ratio [OR] =1.15, 95% CI: 1.10, 2.60; P trend = 0.01). There is a relationship between high salt consumption and anxiety in all three models and this relationship is statistically significant. These results in the raw model, model one and model two are equal to: (raw model, odds ratio [OR] =1.48, 95% CI: 1.04, 2.12; P trend = 0.03), (model-1 , odds ratio [OR] =1.53, 95% CI: 1.07, 2.20; P trend = 0.01) and (model-2, odds ratio [OR] =1.50, 95% CI: 1.02, 2.20; P trend = 0.04). The results of the present study show that high salt intake was more likely to develop depression and anxiety disorders.

**Conclusion:** It seems that not eating healthy food and maybe eating inappropriate foods or lack of some micronutrients can play a role in the occurrence of these disorders.

**Keywords:** salt,Depression,Anxiety,CrossSectional



## A REVIEW OF THE POSITIVE AND NEW EFFECTS OF FENNEL (FOENICULUM VULGARE) IN THE TREATMENT OF BREAST CANCER

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**Background and Aim:** Fennel (*Foeniculum vulgare*) is a fantastic plant of the Apiaceae family due to its abundant nutrients and compounds. Fennel has been widely used in many diseases, including cancer. The phytoestrogenic properties of fennel have led to doubts about its use in hormone-related cancers, including breast cancer. Therefore, to clarify this issue, we decided to review studies of the fennel effects on breast tumor.

**Methods:** Advanced search of pubmed, scopus and google scholar search engine by using "fennel", "foeniculum", "anethole", "estragole", "phytoestrogen", "neoplasm", "Tumor", "breast", "cancer", "malignancy", "carcinoma" and "chemotherapy" keywords and their derivatives were performed from 1990 to 2022, and finally related articles were used.

**Results:** The main factor in the phytoestrogenic properties of fennel is its anethole (p-propenyl methoxybenzene). The isoflavones in fennel inhibit the activity of enzymes that increase estrogen levels. Inhibition of cell proliferation and increased apoptosis of MCF-7 breast cancer cells are important functions of fennel. The inflammation that leads to the survival of tumor cells could be inhibited by fennel. Fennel also has beneficial effects in increasing the response to tumor treatments and reducing the side effects of cancer treatment such as reducing damage to healthy tissues.

**Conclusion:** Generally, it can be concluded that compared to conventional cancer therapies, fennel, as an inexpensive and easily accessible herbal remedy, is devoid of side effects commonly associated with many cancer drugs. It appears that fennel supplementation could be beneficial as an adjuvant therapy in breast cancer treatment. However, it should be noted that the studies conducted in this field are limited, mostly in cell lines and animal models, and further research, particularly clinical trials, are needed to definitively confirm fennel as an anti-cancer plant to prescribe to patients.

**Keywords:** Fennel, Breast cancer, Phytoestrogen, Anethole.



## THE PREVALENCE OF EATING DISORDERS IN FEMALE STUDENTS LIVING IN THE DORMITORIES OF SHOUSHTAR, AHVAZ, AND DEZFUL UNIVERSITIES OF MEDICAL SCIENCES: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Eating disorders are serious mental health conditions characterized by abnormal eating habits that can have a detrimental impact on physical and psychological well-being. Women are disproportionately affected by eating disorders, particularly during adolescence and this issue is far more prevalent than in men. Eating disorders affect up to 5% of the population and show an increase in this prevalence in developing countries. This study aimed to explore the prevalence of eating disorders and their correlation with body mass index (BMI) in female students of Shoushtar, Dezful, and Ahvaz dormitories.

**Methods:** 382 students from 3 dormitories were selected by stratified sampling method for the study. The EAT-26 Nutritional Attitude Questionnaire was employed to estimate the prevalence of eating disorders. Data were analyzed using descriptive statistics, the Chi-square test, and Spearman's correlation test.

**Results:** Among the subjects, 8.1% had a score of above 20 and had eating disorders. Based on the results, there was a significant association between BMI status and eating disorders status ( $p = 0.001$ ). However, this association was not observed when quantitative variables of BMI and eating disorders questionnaire were analyzed.

**Conclusion:** The results of this study indicate the important relationship between BMI and eating disorders.

**Keywords:** eating disorder, dormitory, students, BMI, Eating Behaviors.





## ASSOCIATION BETWEEN CLOCK 3111 T/C POLYMORPHISM WITH GHRELIN, GLP-1, FOOD TIMING, SLEEP AND CHRONOTYPE IN OVERWEIGHT AND OBESE IRANIAN ADULTS

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**Background and Aim:** The aim was to investigate the behavioral (sleep duration, food timing, dietary intake, appetite and chronobiologic characteristics) and hormonal (plasma ghrelin and Glucagon-like peptide-1 concentrations) factors that could explain the previously reported association between the CLOCK 3111T/C SNP and obesity.

**Methods:** This cross-sectional study included 403 subjects, overweight and/or obesity, aged 20- 50 years from Iran. The CLOCK rs1801260 data were measured by the PCR-RFLP method. Dietary intake, food timing, sleep duration, appetite and Chrono-type were assessed using validated questionnaires.

**Results:** After controlling for confounding factors, there was a significant difference between genotypes for physical activity ( $P=0.001$ ), waist circumference ( $P<0.05$ ), BMI ( $<0.01$ ), weight ( $P=0.001$ ), GLP-1 ( $P=0.02$ ), ghrelin ( $P=0.04$ ), appetite ( $P<0.001$ ), chronotype ( $P<0.001$ ), sleep ( $P<0.001$ ), food timing ( $P<0.001$ ), energy ( $P<0.05$ ), carbohydrate ( $P<0.05$ ) and fat intake ( $P<0.001$ ). Our findings also show that people with the minor allele C who ate lunch after 3 PM and breakfast after 9 AM are more prone to obesity ( $P<0.05$ ). Furthermore, there were significant interactions between C allele carrier group and high appetite on fat intake ( $P_{\text{interaction}}=0.041$ ), eat lunch after 3 PM on energy intake ( $P_{\text{interaction}}=0.039$ ) and morning type on fat intake ( $P_{\text{interaction}}=0.021$ ).

**Conclusion:** Sleep reduction, changes in ghrelin and GLP-1 levels, changes in eating behaviors and evening preference that characterized CLOCK 3111C can all contribute to obesity. Furthermore, the data demonstrate a clear relationship between the timing of food intake and obesity. Our results support the hypothesis that the influence of the CLOCK gene may extend to a wide range of variables related to human behaviors.

**Keywords:** CLOCK gene, appetite, food timing, sleep, Chronotype, obesity



## PROGNOSTIC VALUE OF NUTRITION INDICES IN LIVER CIRRHOTIC PATIENTS

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**Background and Aim:** Orthotopic liver transplantation (OLT) is a life-saving procedure in cases of liver failure and organ allocation is important in these patients. Therefore, scoring systems is needed to enhance devoting organ to these patients. Since anthropometric indices play important roles in predicting prognosis of cirrhotic patients, we introduced a scoring system utilizing anthropometric indices to predict survival in cirrhotic patients.

**Methods:** The clinical and anthropometric information of 64 patients referred to Ibn Sina Transplantation Center were followed up for three months. The Least Absolute Shrinkage and Selection Operator (LASSO) logistic regression model was used to devise the new scoring system. The new model was compared to Model for End-stage Liver Disease (MELD) regarding survival rate of the cirrhotic patients.

**Results:** The mean age of patients was  $46.50 \pm 12.871$  years old. Hand Grip (HG), Skeletal Muscle mass Index (SMI), Mean Arterial Pressure (MAP), serum sodium, and total bilirubin were included in the model scoring system that utilizes the area under the curvature of the Receiver Operating Characteristic (ROC) curve and could significantly predict survival in cirrhotic patients when compared with MELD scoring system.

**Conclusion:** We have introduced a new score in prediction of survival probability in cirrhotic patients that can help optimizing transplant resources and in decision making of liver allocation.

**Keywords:** Orthotopic liver transplantation; MELD; Cirrhosis; Survival



## THE EFFECT OF ZINC SUPPLEMENTATION ON BLOOD SUGAR CONTROL, INSULIN RESISTANCE AND LIPID PROFILE IN PREGNANT WOMEN WITH GESTATIONAL DIABETES RECEIVING INSULIN

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**Background and Aim:** Gestational diabetes is increasing and can have adverse effects on pregnancy outcomes. If blood sugar is not controlled with diet, insulin is started as a drug treatment along with diet. Zinc has insulin-like effects and has positive effects on insulin resistance. In this study, we studied the effect of zinc supplementation along with diet and insulin therapy on pregnancy outcomes.

**Methods:** In this randomized, double-blind, placebo-controlled trial, 50 pregnant women with gestational diabetes and receiving insulin were placed in two groups receiving 30 mg of zinc supplement (26) and placebo (24). After 6 weeks fasting blood sugar, serum insulin, insulin resistance, lipid profile were measured.

**Results:** The serum zinc level in the intervention group increased significantly more than the placebo group. After 6 weeks, in the group receiving zinc supplementation, fasting blood sugar decreased ( $11.2 \pm 6.6$  vs.  $+ 6.7 \pm 0.6$  mg/dL,  $P = 0.005$ ), serum insulin level, HOMA.IR index, and serum triglyceride were significantly higher. It was from the placebo group. Other lipid profiles (HDL, LDL, CHOL) were not significantly different in both groups.

**Conclusion:** : Zinc supplementation in pregnant women with diabetes who receive insulin can improve fasting blood sugar levels and insulin resistance in addition to insulin therapy. This effect could be due to the insulin-like effects of zinc. Also, zinc can improve the effects of insulin to control blood sugar by increasing the sensitivity of cells to insulin.

**Keywords:** zinc, supplementation, insulin resistance, pregnant women



## THE EFFECT OF HIGH-CALORIE HOSPITAL FOOD FORMULAS ON THE TREATMENT OF MALNUTRITION IN CHILDREN HOSPITALIZED IN BIBI HAKIMEH HOSPITAL, GACHSARAN CITY.

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**Background and Aim:** When children are hospitalized, their nutritional status (malnutrition) can affect the patient's clinical outcomes. As a result, the length of the patient's stay in the hospital increases the chance of infection and the cost.

**Methods:** This study was conducted on 100 children under 18 years of age who were admitted to Bibi Hakimeh Hospital in Gachsaran city in the period of 2020. The patients were randomly divided into two intervention groups (receiving 6 servings of high-calorie formula prepared with raw materials in the hospital kitchen) and control (receiving regular hospital food)

**Results:** At the end of the study, it was observed that the average weight gain in the formula group was  $1.9 \pm 0.21$  and in the control group was  $0.64 \pm 0.09$ . 35% of Formula group patients improved during hospitalization, 48% had a stable condition and 17% lost weight. While in the control group, 22% gained weight, 45% had a stable condition and 33% lost weight.

**Conclusion:** Pre-prepared high-calorie formulas in the hospital can be used to improve hospital malnutrition or keep it stable, along with nutrition education. This issue may be due to the small volume, good taste, easy to eat and specific and predetermined calories of the formulas.

**Keywords:** malnutrition, children, food formulas



## ASSOCIATION BETWEEN INFANTS ANTHROPOMETRIC OUTCOMES WITH MATERNAL AHEI-P AND DII SCORES

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**Background and Aim:** The present study sought to examine the association between an infant's anthropometric outcomes with maternal Dietary Inflammatory Index (DII) and Alternate Healthy Eating Index for Pregnancy (AHEI-P) scores during the third trimester of pregnancy

**Methods:** This prospective cohort study was applying 130 pregnant women, at the pregnancy training center in west Tehran, Iran (November 2020 to July 2021). The maternal dietary intake, and body mass index (BMI), and social economic level were evaluated. The data about birth weight, birth height, head circumference, and, gestational age at birth were extracted from each child's health records. The ultimate sample included 122 (93.8%) pairs of women/newborn children. The participants, mean age was 28.13  $\pm$  4.66 years with gestational age between 28 to 40 weeks and the mean of BMI was 24.62  $\pm$  3.51.

**Results:** Our outcomes, after adjustment for confounding factors, suggested that those newborn infants in the highest quartile of maternal DII score had a significantly lower weight ( $p < 0.001$ ) and height ( $p = 0.05$ ), in comparison to those in the lowest quartile, but not head circumference ( $p = 0.18$ ). Moreover, after adjustment for confounding factors, results suggested that those newborn infants in the First quartile of maternal AHEI-P score had a significantly lower weight ( $p = 0.018$ ) and, in comparison to those in the higher quartile.

**Conclusion:** Newborn infants with lower maternal DII and higher AHEI-P scores may have a better anthropometric outcome. Further longitudinal and in-depth qualitative and quantitative studies, with a longer-term follow-up, is warranted to support the integrity of our outcomes

**Keywords:** Infants; Anthropometry; Healthy Eating Index; Dietary Inflammatory Index; Pregnancy



## ALMOND INTERVENTION ON OBESITY MEASURES IN ADULTS: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF 37 RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** The results of available clinical trials are inconsistent regarding almond consumption and body composition parameters, therefore we summarized 37 randomized controlled trials (RCTs) and evaluated the association of almond intervention with obesity measures in adults.

**Methods:** Net changes in body weight, body mass index (BMI), waist circumference (WC), fat mass (FM), body fat percent, fat-free mass (FFM), waist-to-hip ratio (WHR), visceral adipose tissue (VAT) and were used to calculate the effect size.

**Results:** Pooled effect sizes indicated a significant reducing effect of almond intervention on body weight (WMD: -0.45 kg, 95% CI: -0.85, -0.05,  $p=0.026$ ), WC (WMD: -0.66 cm, 95% CI: -1.27, -0.04,  $p=0.037$ ), FM (WMD: -0.66 kg, 95% CI: -1.16, -0.17,  $p=0.009$ ), and hunger score (WMD: -1.15 mm, 95% CI: -1.98, -0.32,  $p=0.006$ ) compared with the control group. However, almond did not have a significant effect on BMI (WMD: -0.20 kg m<sup>-2</sup>, 95% CI: -0.46, 0.05,  $p=0.122$ ), body fat percent (WMD: -0.39 %, 95% CI: -0.93, 0.14,  $p=0.154$ ), FFM (WMD: -0.06, 95% CI: -0.47, 0.34,  $p=0.748$ ), WHR (WMD: -0.04, 95% CI: -0.12, 0.02,  $p=0.203$ ), and VAT (WMD: -0.33 cm, 95% CI: -0.99, 0.32). Subgroup analyses indicated that providing  $\geq 50$  g per day of almonds resulted in a significant and more favorable improvement in body weight, WC, and FM. Body weight, WC, FM, and body fat percent decreased significantly only in those trials lasting  $\geq 12$  weeks and when almonds were consumed by subjects with a BMI  $< 30$  kg/m<sup>2</sup>.

**Conclusion:** Further well-constructed randomized clinical trials are needed.

**Keywords:** Prunus dulcis, almonds, Obesity, Body weight



## THE IMPACT OF EATING BREAKFAST ON STUDENT LEARNING AND ACADEMIC ACHIEVEMENT: A REVIEW STUDY

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**Background and Aim:** Breakfast consumption is a very important aspect of student nutrition that can affect student health, including: improved mental performance, physical activity, and memory strengthening. However, it is often neglected or not prepared in a healthy way due to lack of awareness of the importance of this meal. The purpose of this study is to investigate the impact of eating breakfast on student learning and academic achievement.

**Methods:** This review study used the keywords “breakfast” “learning” “academic achievement” and “students” separately and in combination to search for articles in Persian databases of the University of Social Welfare and Rehabilitation (SID), medical journals in Iran, and the international database PubMed, as well as manual searching in Google Scholar from 2019 to December 2023. A total of 32 articles related to the topic were reviewed and analyzed.

**Results:** A review of the relevant studies shows that breakfast is the most important source of nutrients for the brain after a night’s rest and energy for daily activities. Academic achievement is directly related to learning, and learning is directly related to nutrition. The more nutritious the foods in breakfast, the better the brain cells process information.

**Conclusion:** Given the important role of breakfast in the health and efficiency of students, it should be tried to improve the nutritional status of students through education and increasing nutritional awareness and using nutritional support strategies such as variety of breakfast foods by parents and educators.

**Keywords:** Breakfast, Learning, Academic Achievement, Students, Review Study



## PROTEIN SUPPLEMENTATION AFTER BARIATRIC SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Bariatric surgery (BS) helps individuals with obesity achieve significant weight loss and improve their overall health. However, this transformative journey also requires careful attention to post-surgery nutritional needs. One crucial aspect of that is protein supplementation. In this meta-analysis study, we delve into the benefits of protein supplementation after BS and its impact on body composition.

**Methods:** PubMed/Medline, Scopus, ISI Web of Science, and Google Scholar databases were searched up to November 2023. Randomized clinical trials (RCTs) included if they were examined the effect of protein supplementation on the body composition after BS. The overall effect was presented as the weighted mean difference (WMD) at a 95 % confidence interval (CI) in a random-effects meta-analysis model. Also, we used the GRADE approach to examine the level of certainty of the evidence

**Results:** 11 RCTs were included in our meta-analysis and show protein supplementation has a significant effect on reducing weight (WMD: -1.61, 95% CI: -2.75 to -0.48), and fat mass (WMD: -3.91, 95% CI: -6.31 to -1.51), and results in a lower reduction of muscle mass (WMD: 1.33, 95% CI: 0.1 to 2.57), and fat-free mass (WMD: 2.14, 95% CI: 0.82 to 3.46) compared to placebo. There was no significant difference in weight and BMI. A moderate certainty of evidence for both weight and BMI and a low certainty of evidence for other outcomes were found by GRADE assessment,

**Conclusion:** As the beneficial effects of protein supplementation were seen, these supplements can be taken into account for improving body composition after BS.

**Keywords:** bariatric surgery, protein supplementation, amino acid supplementation





## IMPACT OF KITCHEN MECHANIZATION ON COST REDUCTION AND IMPROVEMENT OF PATIENT MEAL QUALITY AT MEHR HOSPITAL, AHVAZ

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**Background and Aim:** The mechanization of cooking facilities is a crucial evaluation indicator that significantly contributes to economic improvement and enhanced cooking quality. This study aims to investigate the advantages of industrializing the hospital kitchen.

**Methods:** In this qualitative study, after reconstructing the kitchen environment according to HACCP regulations and installing food preparation and cooking equipment, the benefits of this project were examined.

**Results:** Upon industrializing the kitchen (in the first 6 months of 2018 compared to 2017), the following reductions were observed: approximately 45 minutes reduction in cooking time, decreased maintenance costs for equipment, and a 35% decrease in water, electricity, and gas expenses. Other benefits included maintaining food temperature through the use of heated trolleys, significant improvement in food hygiene through steam systems and reduced oil consumption, and an increase in patient satisfaction with food quality and taste from 60% to 80%

**Conclusion:** Industrializing the kitchen led to a considerable reduction in operating costs and improved food quality and health standards

**Keywords:** food preparation and cooking equipment, healthy nutrition, patient meal quality, kitchen industrialization



## SCHOOL FOOD PROVISION GLOBALLY

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**Background and Aim:** The objective is to gather information about food availability in each school food provision and explain how students access school food. Also, various school food environments, such as tuck shops, canteens, cafeterias, à la carte options, buffets, kiosks, and vending machines, are being reviewed to identify whether students have access to a variety of food choices and to determine the types of food and beverages are usually offered through these environments.

**Methods:** Three databases were searched: Web of Science, Pumped, and Scopus. Articles were published in English language from 2000-2023 with information about school food, healthiness of food items, and financial aid to feed students were included. Also, relevant grey literature, through searching online websites like WFP, FAO, GCNF, and Ministry of Education, was found to complete this systematic review.

**Results:** The final selection of studies consisted of 71 papers with 20 grey literature from additional sources, which were mostly cross-sectional with the self-reported questionnaires. Almost all countries have feeding schemes for primary-aged students in deprived areas, especially Africa and Asia, aiming to reduce food insecurity and improve educational achievements. In comparison, developed areas provide students with various food options through canteens. Besides, vending machines and tuck shops are the second most common sources of food, especially in European secondary schools. However, vended items are mostly ultra-processed and unhealthy.

**Conclusion:** School food disparities have been identified in deprived countries compared to developed nations. A need exists, however, for further studies with other languages and school types to improve the generalizability of the current findings.

**Keywords:** School food, School food programme, School food environment, School feeding, School meal



## EFFECT OF KETOGENIC DIET AND HIGH-INTENSITY FUNCTIONAL TRAINING ON BRAIN METABOLITE CONCENTRATIONS IN HEALTHY OVERWEIGHT AND OBESE ADULTS

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**Background and Aim:** Obesity and overweight may have detrimental effects on neuronal function through disturbances in brain metabolism; therefore, this study evaluated the effects of High-Intensity Functional training and a ketogenic diet on neurometabolites, including N-acetylaspartate, choline, and myo-inositol, in obese and overweight healthy adults.

**Methods:** The participants were randomly assigned to three groups: control, HIFT, and HIFT+ketogenic diet. Over a period of 6 weeks, the HIFT group completed a 30-40 minute training session three times a week. The HIFT+ketogenic diet group followed a standard ketogenic diet based on body weight and adhered to the HIFT protocol. After six weeks, a urinary ketone test strip was used to compare the presence of ketone bodies in all groups. Subsequently, the subjects were evaluated at the Tehran University Brain Mapping Centre using proton magnetic resonance spectroscopy (HMRS) method to assess brain neurometabolites.

**Results:** Significant differences ( $p < 0.05$ ) were observed in the concentrations of neurometabolites between the HIFT and HIFT+ketogenic groups compared to the control group. The HIFT group exhibited the highest concentration of N-acetyl aspartate, whereas the HIFT+ketogenic group had the highest concentration of choline. Additionally, the concentration of myoinositol decreased significantly ( $p < 0.05$ ) in the HIFT and HIFT+ketogenic groups compared to the control group.

**Conclusion:** High-intensity functional training and the production of ketone bodies can result in effective changes in neurometabolite concentrations that improve brain health and may have more lasting effects on brain metabolite concentrations.

**Keywords:** ketogenic diet; High-Intensity functional training; obesity; neurometabolite; magnetic resonance spectroscopy



## EFFECT OF KETOGENIC DIETS ON EXERCISE PERFORMANCE AND BODY COMPOSITION: A COMPREHENSIVE REVIEW

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**Background and Aim:** This review examines the impact of ketogenic diets (KD) on exercise performance and body composition through the analysis of three distinct studies.

**Methods:** A systematic search on PubMed, targeting articles within the last three years, was conducted with keywords such as sports performance, diet in sports, and body composition. The selected articles aimed to shed light on the effects of different dietary interventions on exercise outcomes.

**Results:** In the resistance-trained group, KD demonstrated effective fat loss while preserving muscle mass. For cyclists and triathletes, KD did not significantly impact metabolic parameters compared to a traditional Western diet (WD). In male bodybuilders, KD preserved muscle mass and proved beneficial for fat loss without compromising muscle performance.

**Conclusion:** Ketogenic diets exhibit promising outcomes in diverse athletic populations, showcasing potential benefits for fat loss and muscle preservation. However, individualized nutritional guidance is crucial. While KD may present challenges, such as the reduction in testosterone levels observed in male bodybuilders, its positive effects on inflammation markers and neurotrophic factors highlight its multifaceted role in addressing various athletic demands.

**Keywords:** Ketogenic Diet; Exercise Performance; Body Composition; sports performance; diet in sports



## THE EFFECT OF HIGH-INTENSITY INTERVAL TRAINING AND NUTRITIONAL MEDIATING VARIABLES ON DYNAMIC BALANCE AND AEROBIC CAPACITY OF NATIONAL ROWING TEAM ATHLETES

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**Background and Aim:** This study aimed to examine the effect of high-intensity interval training (HIIT) and nutritional mediating variables (carbohydrate, iron and vitamin D) on dynamic balance and aerobic capacity of national rowing team athletes.

**Methods:** 44 male rowers were randomly divided into 4 groups of 11 people: HIIT, HIIT and nutritional mediating variables, nutritional mediating variables and control. HIIT was rowing on an ergometer (for 1 minute at 100%  $v\dot{V}O_{2max}$ ) for 8 weeks. nutritional Mediating variables of diet were measured by analyzing the menu of the national team camp, 24-hour food recall and food frequency questionnaire (FFQ). Dynamic balance and aerobic capacity were measured before the start of the first training session and 48 hours after the last training session. Statistical analysis was conducted using SPSS 24, with a significance level set at  $P \leq 0.05$ .

**Results:** The HIIT group and HIIT + nutritional mediator variable both showed a notable improvement in dynamic balance and aerobic power after 8 weeks ( $P < 0.05$ ). Additionally, the nutritional mediator variables led to a significant increase in dynamic balance in both the nutritional mediator variable and the HIIT + nutritional mediator variable groups, compared to the control group ( $P < 0.05$ ).

**Conclusion:** The national rowing team's dynamic balance and aerobic capacity can be improved through 8 weeks of HIIT, with mediator variables such as carbohydrates, iron, and vitamin D.

**Keywords:** High-intensity interval training ; nutritional mediating variables ; dynamic balance ; aerobic capacity ; rowing



## SERUM ZONULIN LEVEL AS A NOVEL APPROACH IN DIAGNOSIS AND FOLLOW-UP OF PATIENTS WITH CELIAC DISEASE. A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** It has been proposed that zonulin, a tight junction protein regulator, is involved in the pathogenesis of celiac disease (CD). In this regard, various studies compared the mean serum zonulin in patients with CD and healthy controls. However, this remains a subject of controversy due to contradictory results. Therefore, the goal of the present study was to summarize the findings of studies comparing CD patients' serum zonulin levels to healthy controls.

**Methods:** We searched PubMed, Scopus, and ISI Web of Science databases up to May 2022. All observational studies measured serum zonulin in adult patients with CD and healthy controls were included without language or date restrictions. The standardized mean differences (SMDs) and standard deviations were pooled using a random-effects model.

**Results:** Of 708 studies, six studies with 184 CD and 206 control participants were included in the systematic review and meta-analysis. According to a pooled analysis, CD patients had significantly higher zonulin levels than healthy controls (SMD = 1.08 ng/mL; 95% CI = 0.64, 1.52;  $P < 0.001$ ). Subgroup analyses were performed according to adherence to a gluten-free diet (GFD), zonulin assessment method, and CD diagnosis. The significant effect was maintained in all subgroups.

**Conclusion:** CD is significantly correlated with a higher level of serum zonulin. Thus, zonulin could be a potential biomarker for the diagnosis of CD, which deserves further investigation.

**Keywords:** Celiac disease, Zonulin, Gluten-free diet, Meta-analysis



## INVESTIGATING THE INTERACTION BETWEEN LONG NON-CODING RNAs MALAT1 AND TUG1 WITH DIETARY FAT QUALITY INDICES ON METABOLIC SYNDROME COMPONENTS IN OVERWEIGHT AND OBESE WOMEN: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Obesity is one of the most important factors involved in the occurrence of metabolic syndrome components, which is influenced by the interaction between environment and genetics. long non-coding RNAs (lncRNAs) perform various biological functions in the body, and their expression disorders are associated with metabolic diseases. Also, the type of diet, especially the quality of fat, can be related to metabolic syndrome. Therefore, the aim of this study was to investigate the interaction between metastasis-associated lung adenocarcinoma transcript 1 (MALAT1) and taurine upregulated gene 1 (TUG1) with fat quality indicators on the components of metabolic syndrome in overweight and obese women.

**Methods:** 346 overweight and obese adult women (18-48 years) were included in the study. The body composition of the participants was assessed by body analyzer. Blood pressure and various biochemical evaluations were evaluated. Dietary assessment was assessed with food frequency questionnaire (FFQ). Real-time polymerase chain reaction (real-time PCR) was performed to assess the lncRNAs MALAT1 and TUG1.

**Conclusion:** Significant positive significant interactions were observed between MALAT1 expression and dietary fat quality indices (CSI) on triglyceride and cholesterol, waist circumference and insulin resistance ( $p < 0.05$ ). Also, there were positive significant interactions between TUG1 expression and CSI on blood glucose levels, insulin resistance and fat mass ( $p < 0.05$ ). It seems that MALAT1 and TUG1, through interaction with fat quality indicators, play a role in increasing the risk of metabolic syndrome components. However, more prospective studies are necessary to clarify this concept.

**Keywords:** Long non-coding RNA, dietary fat quality, metabolic syndrome, Obesity.



## INVESTIGATION OF THE INTERACTION BETWEEN LONG NON-CODING RNAs MALAT1 AND TUG1 WITH GLYCEMIC INDEX AND LOAD ON PSYCHOLOGICAL DISORDERS (STRESS, ANXIETY, DEPRESSION) IN OVERWEIGHT AND OBESE WOMEN: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Obesity is associated with psychological disorders such as depression, anxiety, and stress; and environmental factors and genetics play a crucial role in this regard. Many of the long non-coding RNAs (lncRNAs) are related to the nervous system pathophysiology. We also intend to identify the possible interaction between metastasis-associated lung adenocarcinoma transcript 1 (MALAT1) and taurine upregulated gene 1 (TUG1) with the dietary glycemic index and load related to psychological disorders in women with overweight and obesity.

**Methods:** 346 overweight and obese women (18-48 years) were recruited in the present investigation. Food intake, glycemic index (GI), and glycemic load (GL) indices were determined using a valid and reliable food frequency questionnaire (FFQ) containing 147 items. Mental health was assessed by the depression-anxiety-stress scales (DASS-21). Real-time polymerase chain reaction (real-time PCR) was performed to assess the lncRNAs MALAT1 and TUG1.

**Conclusion:** A positive association was seen between anxiety and MALAT1 in obese and overweight women ( $P=0.007$ ,  $CC=0.178$ ). After adjustment for confounders including age, energy intake, physical activity, total fat, income, marriage, thyroid, and BMI, positive interaction between GI and TUG1 on DASS-21 ( $\beta=0.006$ ,  $CI=0.001, 0.01$ ,  $P=0.031$ ), depression ( $\beta=0.002$ ,  $CI=0.001, 0.004$ ,  $P=0.019$ ), and stress ( $\beta=0.003$ ,  $CI=0.001, 0.005$ ,  $P=0.027$ ) was observed. Moreover, there was a positive interaction between GL and TUG1 on stress ( $\beta=0.03$ ,  $CI=0.001, 0.07$ ,  $P=0.048$ ). The lncRNA TUG1 appears to be associated with depression and stress through interaction with GI and correlated with stress through interaction with GL. However, further investigations are required to establish this concept.

**Keywords:** Long non-coding RNA, Glycemic index, Glycemic load, Diet, Obesity, Psychological disorders





## THE ASSOCIATION BETWEEN MAJOR DIETARY PATTERNS AND SLEEP QUALITY IN OVERWEIGHT AND OBESE IRANIAN WOMEN: A CROSS-SECTIONAL STUDY

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**Background and Aim:** The object of this cross-sectional study is to investigate the association between major dietary patterns and sleep quality in overweight and obese Iranian women.

**Methods:** The study was conducted among 308 overweight and obese women aged 18 and 50 with a body mass index (BMI) range between 25 to 40 kg/m<sup>2</sup>. Food intake was evaluated using valid and reliable food frequency questionnaire (FFQ) containing 147 items. The dietary patterns were identified using factor analysis and included a healthy dietary pattern (HDP) and an unhealthy dietary pattern (UDP). The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep quality.

**Results:** The mean age and BMI of participants were 38.2 ± 5.3 years and 30.9 ± 2.3 kg/m<sup>2</sup>, respectively. In model 1, after adjusting for age, BMI, physical activity (PA), and energy intake, a significant association between HDP and sleep quality was observed in the second quartile (OR: 0.27; 95% CI: 0.13, 0.55, p=0.04).

**Conclusion:** The study concluded that major dietary patterns are associated with sleep quality in overweight and obese Iranian women. In particular, HDP is associated with better sleep quality, while UDP is associated with poorer sleep quality. These findings suggest that promoting a healthy diet pattern may help improve sleep quality in overweight and obese individuals.

**Keywords:** Healthy dietary pattern; unhealthy dietary pattern; sleep quality; obesity; overweight.



## POMEGRANATE EXTRACT SUPPLEMENTATION IMPROVES LUNG FUNCTION PARAMETERS AND IL-35 EXPRESSION IN PARTICIPANTS WITH MILD AND MODERATE PERSISTENT ALLERGIC ASTHMA: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL

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**Background and Aim:** Existing asthma treatments are associated with side effects and limitations, which has led to an interest in alternative and complementary therapies. Given the anti-inflammatory properties of pomegranate, the present study aimed to determine the impact of pomegranate extract supplementation on lung function parameters evaluated through spirometry, high-sensitivity C-reactive protein (hs-CRP), pro-oxidant antioxidant balance, and interleukin 35 (IL-35) in participants with mild and moderate allergic asthma (based on forced expiratory volume in 1 second (FEV1) and clinical symptoms).

**Methods:** Participants with mild and moderate allergic asthma ( $n = 64$ ) were randomly assigned to two groups: the intervention group, which received two pomegranate extract capsules (500 mg/day), or the control group for eight weeks. Also, the physician prescribed similar drugs to the participants in the study.

**Results:** At the end of the study, the change levels of IL-35 in the intervention group increased significantly compared to the control group. In terms of the lung function parameters, FEV1/forced vital capacity (FVC) (FEV1/FVC) ratio enhanced significantly in the intervention group compared to the control group. Also, the pomegranate extract significantly improved forced expiratory flow 25–75% (FEF25–75%), FEV1/FVC ratio, and FEV1 in the intervention group. No significant changes in FEV1 values were observed between the two groups at the end of the study. Also, no significant changes were seen in other indicators.

**Conclusion:** It seems that pomegranate extract can improve lung function parameters and IL-35 expression in mild and moderate allergic asthma.

**Keywords:** Asthma, high-sensitivity C-reactive protein, interleukin-35, lung function, pomegranate



## THE EFFECTIVE OF CREATININE LEVEL ON RELATIONSHIP BETWEEN FBS AND 2HPP WITH HBA1C IN DMT2 REFERRED TO CLINIC BASED ON THE TYPE OF TREATMENT AND ETHNICITY BETWEEN 2019 AND 2018

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**Background and Aim:** Kidney diseases are usually complication diabetes patients, with up to one-half demonstrating signs of renal damage.

**Methods:** This study was carried out cross-sectional and with a descriptive-analytical approach using the data recorded in the files of type 2 diabetic patients referred to Clinic between 2020-2022. Data were analyzed using SPSS v.18 software and through Mann-Whitney, Spearman, and linear regression analysis. The sample size, is 259 persons. participant were divided into two groups : creatinine levels < 1.3 mg/dl, creatinine levels  $\geq$ 1.3 mg/dl

**Results:** All types of treatment at all creatinine levels, the relationship between HbA1c values and 2hPP was positive and significant correlation ( $p=0.001$ ). In insulin treatment and combinatorial treatment group at creatinine  $\geq$ 1.3mg/dl, HbA1c values with 2hPP wasn't any positive and significant correlation ( $p=0.001$ ).

**Conclusion:** Creatinine level is significantly associated in relationship between FBS and 2hPP with hemoglobin A1c in different treatment categories. The association between creatinine level and HbA1c can be useful diabetes type 2 patients. There was some limitation in this research. the list incompleteness of patients' files was the most important limitation affecting our study, which was solved by increasing the number of patients' files. HbA1c is measured in different ways, it was not possible to compare the results based on the HbA1c measurement method. The correlation between HbA1c with FBS and 2hPP was investigated based on the type of treatment and ethnicity, while there were fewer people with Turkmen and Sistani ethnicities in insulin and oral+insulin treatments, which was a limiting factor and creates the need for more studies.

**Keywords:** Diabetes; Creatinine; Hemoglobin; Ethnicity; Treatment; Kidney



## ASSOCIATION BETWEEN DIETARY ACID LOAD AND ODDS AND SEVERITY OF RHEUMATOID ARTHRITIS

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**Background and Aim:** This study examined the relationship between dietary acid load and the risk of rheumatoid arthritis (RA) and disease severity.

**Methods:** This case-control study was conducted on 95 newly diagnosed RA patients and 190 age- and sex-matched healthy controls. Dietary intake was assessed using a validated 168-item food frequency questionnaire (FFQ). The dietary acid load was measured using net endogenous acid production (NEAP), dietary acid load (DAL), and potential renal acid load (PRAL) scores. We assessed the disease severity using the disease activity score 28 (DAS-28), erythrocyte sedimentation rate (ESR), and visual analog scale (VAS) for pain, morning stiffness, and tender and swollen joints.

**Results:** Mean PRAL, NEAP, and DAL scores in RA patients were  $0.53 \pm 13.5$ ,  $55.2 \pm 30$ , and  $10.3 \pm 12.6$  mEq/day, respectively. Multivariate Cox regression models were used to estimate the risk of RA across tertiles of PRAL, NEAP, and DAL. After adjustment for potential confounders including education, smoking, hypertension, physical activity, BMI, and energy, no significant association was observed between the highest compared with the lowest tertiles of the PEAL, NEAP and DAL scores with RA risk (OR= 1.46, 95% CI: 0.77-2.74, P for trend =0.22, OR=1.14, 95% CI: 0.61-2.10, P for trend =0.68, and OR=1.71, 95% CI: 0.88-3.30, P for trend =0.11 respectively). Also, dietary acid load scores were not significantly associated with disease severity in either crude or multivariate models (P value > 0.05).

**Conclusion:** This study failed to obtain independent associations between dietary acid load and the risk and severity of RA. However, further research is warranted to infer these findings.

**Keywords:** Dietary acid load, Rheumatoid arthritis, Disease activity score



## IMPACT OF COVID-19 OUTBREAK ON VITAMIN C AND VITAMIN D SUPPLEMENTS USE AMONG ADULTS OF LARESTAN REGION, A DESCRIPTIVE CROSS-SECTIONAL STUDY IN LARESTAN, FARS PROVINCE, IRAN

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**Background and Aim:** During the COVID-19 lockdown, people's social and lifestyle habits, including supplement intake, underwent significant changes worldwide. However, there is limited information available about these changes. Therefore, this cross-sectional study aimed to investigate the impact of the COVID-19 lockdown on supplement usage among the population in Larestan

**Methods:** this study is a cross-sectional study conducted in Ewas City during the COVID-19 pandemic between 1401 and 1402. The study involved adults aged 20 to 60 and collected demographic data from 347 completed questionnaires. Participants were asked about their history of chronic diseases and disabilities, as well as their history of COVID-19 infection. The study compared quantitative data using independent sample-t tests and one-way analysis of variance if normality was established; otherwise, non-parametric tests such as Wilcoxon and Kruskal-Wallis were used.

**Results:** 72 individuals increased vitamin D intake and 154 individuals increased vitamin C intake, as per participants' statements. The study found that increased consumption of vitamin C supplements was linked to various health issues, including diabetes, heart disease, obesity, high blood pressure, kidney stones, respiratory symptoms, and higher education levels. However, family income and the number of family members did not significantly impact this relationship. On the other hand, taking vitamin D supplements showed only a significant relationship with higher education levels.

**Conclusion:** : Vitamin C supplement usage has increased more than Vitamin D. Raising awareness about supplement benefits could prevent epidemics and reduce healthcare costs. Larestan residents should increase their awareness and use of vitamin supplements to combat COVID-19.

**Keywords:** COVID-19, supplementary, supplementary, vitamin C, vitamin D



## ANTHROPOMETRIC AND DEPRESSION ASSESSMENTS AMONG HIV/AIDS PATIENTS: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Since 20-37% of AIDS/Human immunodeficiency virus (HIV) patients suffer from depression, it has become one of the public health concerns recently. Despite this fact, there was no study to declare the status of depression and anthropometric measurements among HIV patients. As a result, the current investigation aimed to assess anthropometric as well as depression status among HIV/AIDS individuals.

**Methods:** This cross-sectional study was conducted with 335 HIV subjects who were referred to the Behavioral Disorders Counseling Center in Kermanshah province in Iran. Informed consent was obtained from all patients before participating in the study. The Beck Depression Inventory (BDI) form was applied to screen 21 symptoms of depression with a score range of 0-63. Physical activity (PA) was assessed by the International Physical Questionnaire Short Form. A food frequency questionnaire (FFQ) was used to calculate energy intake. A P-value<0.05 was considered significant.

**Results:** 63% of the patients were male. A higher prevalence of depression was among men (25%) than women (12.2%). The mean BMI of the patients with severe depression ( $21.77 \pm 3.94$  kg/m<sup>2</sup>) was significantly lower than other categories of depression, based on the BDI (P=0.008). Moreover, the mean of PA (P=0.035) and energy intake (P<0.001) in patients with severe depression were significantly lower than other categories of depression.

**Conclusion:** The finding showed lower BMI, PA, and, energy intake among HIV patients with severe depression. Thus, it is suggested to screen and pay more attention to the nutritional as well as depression status of these patients.

**Keywords:** " AIDS "," HIV "," depression "," anthropometric assessment "," Energy intake "," physical activity ".



## THE POTENTIAL EFFECT OF BLUEBERRY ON COGNITIVE HEALTH AND MOOD STATE BASED ON HUMAN INTERVENTION STUDIES: SYSTEMATIC REVIEW & MINI META-ANALYSIS

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**Background and Aim:** Blueberries are known for their high content of several bioactive compounds, which have been shown to be neuro-protection. Several human interventional studies have been conducted to assess the effects of blueberry intake on cognitive performance, however, the results of clinical trials are inconclusive. Therefore, this systematic review and meta-analysis evaluated the effect of blueberry supplementation on some aspects of cognitive performance and mood parameters using data from clinical trials based on existing evidence.

**Methods:** Relevant studies, published up until April 2021, were searched through PubMed/Medline, Scopus, Embase, and Google Scholar. The random effect size was used to estimate the pooled effect size. Heterogeneity between studies was evaluated by the Cochrane Q test and I-squared (I<sup>2</sup>).

**Results:** Fourteen randomized trials were included in the quantitative analysis, and six were pooled for statistical analysis. Blueberry intervention resulted in no significant change in mood state score (WMD = 0.03; 95% CI:-0.80 to 0.87, P = 0.16). Moreover, no significant effect of blueberry intake was shown in attention task reaction time (WMD = -1.50 ms; 95% CI:-24.75 to -21.75, P = 0.9), percentages of attention task accuracy (WMD = 0.85; 95% CI:-2.57 to 0.86, P = 0.3), one-back test accuracy (WMD = 0.03; 95% CI:-0.04 to 0.09, P = 0.4). A significant effect was indicated (WMD = 0.08; 95% CI: 0.02 to 0.13, P = 0.005) in two-back test accuracy.

**Conclusion:** We found a significant effect of blueberry consumption on two-back test accuracy as a cognitive outcome.

**Keywords:** Blueberry, Anthocyanin, Cognition, Mood, Intervention, Human



## THE EFFECT OF THERAPEUTIC AND NUTRITIONAL CARE IN THE CONTROL OF TYPE 2 DIABETES BASED ON AN OBSERVATIONAL STUDY

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**Background and Aim:** Diabetes is a prevalent and persistent health issue that has a substantial impact on both the well-being of individuals and the financial burden on society. Effective management of blood sugar levels and prevention of complications are crucial for patients, with nutritional care being a key component. The objective of this research is to examine the correlation between nutritional care and alterations in glycosylated hemoglobin levels among individuals diagnosed with type 2 diabetes.

**Methods:** A study was conducted on 200 patients diagnosed with type 2 diabetes, utilizing medical records of those receiving medical care. The participants completed the Diabetes Self-Management Questionnaire (DSMQ). Additionally, demographic information, disease history, treatment monitoring, self-monitoring of blood sugar, diet data, physical activity, and biochemical tests were obtained for analysis. This was a retrospective cohort study.

**Results:** Out of the 200 patients with type 2 diabetes studied, 45% were male and 55% were female. The majority of patients (90%) lived in urban areas, while only 10% lived in rural areas. The study found that patients who received nutritional education, including information on portion sizes, glycemic index, and adherence to weight loss diets, and who were followed up by a nutritionist, had better control of their diabetes. Patients who were aware of normal blood glucose levels and the consequences of uncontrolled diabetes also showed a significant relationship with better control of the disease.

**Conclusion:** these findings highlight the importance of incorporating nutritional education into the management plan for patients with type 2 diabetes.

**Keywords:** Nutritional care, glycosylated hemoglobin, type 2 diabetes





## THE ASSOCIATION BETWEEN THE DAIRY CONSUMPTION AND STRESS AMONG ADULTS: RESULTS OF CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Dairies are one of the important food groups; However dairy consumption is under average in Iran. We aim to figure out if there is any association between consuming dairy products and stress in adults.

**Methods:** This cross-sectional study was conducted among 604 respondents aged 18 to 65 years and a mean age of 33.8 from different regions of Iran. A validated Food Frequency Questionnaire was used to assess dairy consumption. Stress was evaluated by the DASS-21 scale. To examine the relationship between dairy consumption and stress, logistic regression analysis was applied in crude and adjusted models.

**Results:** There was no significant association between dairy consumption and stress (OR: 0.881; 95%CI: (0.491-1.582); P: 0.672) in the crude model. Moreover, no significant association was observed in the adjustment model for variables including total Kcal, BMI, age, gender and smoking cigarette with stress. (OR:0.272; 95%CI: (0.343-1.351); P:0.681).

**Conclusion:** Our research findings, there was no evidence confirming an association between dairy consumption and stress. Therefore, more studies need to be performed in the future.

**Keywords:** Cross sectional; dairy; stress; IRAN



## THE ASSOCIATION BETWEEN THE RATE OF FOOD CHEWING AND THE ODDS OF GENERAL AND CENTRAL OBESITY AMONG ADULTS

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**Background and Aim:** Obesity is a public health problem and one of the important risk factors for diabetes, blood pressure, fatty liver and cancer. Chewing food completely and slowly is an appetite control strategy to prevent obesity. The rate of food chewing is related to total caloric intake and dietary thermogenesis. The aim of this study is to investigate the relationship between rate of food chewing and central and general obesity.

**Methods:** 604 adults aged 18 to 65 from different regions of Iran participated in this cross sectional study. The rate of food chewing was measured using a standard questionnaire. General obesity was assessed using BMI (body mass index) and central obesity using waist circumference (WC) and waist-to-hip ratio (WHR) indices. To investigate the relationship between the rate of food chewing and general and central obesity, logistic regression was used in crude and adjusted models.

**Results:** The odds of central obesity were higher in people who chewed food more than those who chewed the least (OR = 0.37; 95% CI= 0.17-0.79; P = 0.01) in the crude model. This association was not significant after adjusting for potential confounding variables (OR = 0.73; 95% CI= 0.25-2.10; P = 0.57). There was no significant association between the rate of food chewing and general obesity in crude and adjusted model.

**Conclusion:** We found that there was no significant association between the rate of food chewing and the odds of general and central obesity in the adjusted model. Prospective studies are needed for more investigation.

**Keywords:** food chewing, obesity, Iran, cross-sectional



## HIGH PROTEIN LOW CARBOHYDRATE LOW FAT (HPLCLF) AND LOW PROTEIN HIGH CARBOHYDRATE HIGH FAT (LPHCHF) SCORES AND RISK OF PRIMARY INSOMNIA AMONG IRANIAN ADULTS: A CASE-CONTROL STUDY

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**Background and Aim:** A few epidemiological data are available assessing the associations of High protein low carbohydrate low fat (HPLCLF) and Low protein high carbohydrate high fat (LPHCHF) scores and risk of primary insomnia. We aimed to examine the associations of dietary scores with the prevalence of primary insomnia.

**Methods:** We analyzed data from a case-control study of 111 patients with primary insomnia and 333 controls. The HPLCLF and LPHCHF was calculated based on data collected from 168-item validated food frequency questionnaire. Sociodemographic data, physical activity, and anthropometric measures such as body weight, height, and waist circumference were determined. Partial correlation coefficient was used for assessing the correlation between the HPLCLF and LPHCHF with food sources. The odds ratio (OR) with a 95 % confidence interval (CI) of insomnia across tertiles of HPLCLF and LPHCHF was reported, and p-values < 0.05 were considered statistically significant.

**Results:** Individuals in the highest tertile of HPLCLF were 50% less likely to have insomnia (OR: 0.50; 95% CI: 0.27–0.93, P=0.02), compared with those in the bottom category in the crude model. After adjusting for the potential confounding factors, there was a positive significant relationship between insomnia risk and LPHCHF in the model 2 (OR: 1.92; 95% CI: 1.05–3.51, P=0.03).

**Conclusion:** Our study showed that, HPLCLF score lowers the odds of insomnia. We strongly recommend that the concepts proposed in this study must be tested in future longitudinal researches, in order to determine the association of HPLCLF and LPHCHF scores with insomnia.

**Keywords:** insomnia, nutrition, HPLCLF, LPHCHF



## DIFFERENT HIGH PROTEIN SCORES AND NON-ALCOHOLIC FATTY LIVER DISEASES: A CASE CONTROL STUDY

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**Background and Aim:** The precise association between various high protein scores and the risk of NAFLD is not well-established in the literature. As a result, this case-control study was conducted to explore the potential link between different high protein scores and the risk of NAFLD in the adult population.

**Methods:** We analyzed data from a case-control study of 225 patients with NAFLD cases and 450 controls. All participants completed a validated 168-item food frequency questionnaire, the results of which were subsequently used to calculate “high protein low CHO-fat”, “high protein-CHO and low-fat score, and “high protein-fat, and low CHO score”.

**Results:** In the age and sex-adjusted model, the odds of NAFLD decreased across tertiles of high protein low CHO-fat score (OR: 0.57; 95%CI: 0.38–0.87, Ptrend=0.006), and this association remained significant in the multivariable adjusted model (OR: 0.71; 95%CI: 0.56–0.91, Ptrend=0.016) after controlling for potential confounders, including BMI and WHR. However, there was no significant association between high protein-CHO low-fat score (OR: 0.85; 95%CI: 0.68–1.08, Ptrend=0.152) and high protein-fat low CHO score (OR: 0.85; 95%CI: 0.67–1.08, Ptrend=0.175) and the risk of NAFLD.

**Conclusion:** Overall, this study highlights the potential role of dietary patterns in modulating the risk of NAFLD. The findings suggest that a high protein lower CHO-fat diet may be associated with a reduced likelihood of developing NAFLD. However, further research is needed to confirm these associations and explore the underlying mechanisms involved.

**Keywords:** high protein scores, non-alcoholic fatty liver disease, NAFLD



## THE EFFECT OF VITEX AGNUS-CASTUS ON FERTILITY HORMONES IN WOMEN WITH POLYCYSTIC OVARY SYNDROME: A SYSTEMATIC REVIEW OF RANDOMIZED CLINICAL TRIALS

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**Background and Aim:** Polycystic ovary syndrome (PCOS) is a widespread endocrine disorder in women of fertile age, with an estimation of 6-15%. Despite many works conducted to determine the effects of the Vitex agnus-castus on PCOS manifestations, there has not been a comprehensive study to compile the evidence in this regard. Hence, we navigated a systematic review study to summarize the results of the effect of Vitex agnus-castus on PCOS outcomes.

**Methods:** We conducted a strategic search of PubMed, Scopus, Embase, ProQuest, and Google Scholar databases using related keywords including "Vitex agnus-castus", AND "polycystic ovary syndrome", OR "PCOS", OR "Ovarian Cysts", AND "clinical trial" from inception to October 2023. The inclusion criteria were all randomized clinical trials (RCT) in English-language journals on females with PCOS who received Vitex agnus-castus. We applied the Critical Appraisal Skills Program (CASP) checklist to assess the quality of the included articles.

**Results:** Out of 58 articles found in this research, only 5 studies had the eligible criteria. Investigations demonstrated that consuming Vitex agnus-castus was associated with increased levels of Luteinizing hormone (LH) and estrogen. While progesterone, free testosterone, and follicle-stimulating hormone (FSH) concentration decreased remarkably due to its anti-androgenic, emmenagogue, anti-oxidant, and anti-thrombotic properties. However, Vitex agnus-castus did not show significant improvement in anthropometric indices, lipid profiles, and glycemic status in PCOS women.

**Conclusion:** This study indicated that Vitex agnus-castus is a safe herbal with beneficial effects on alleviating the manifestations in PCOS women. Future trials with a larger sample size and longer duration are advised.

**Keywords:** Vitex agnus-castus, polycystic ovary syndrome, hormonal status, systematic review



## PLANT AND ANIMAL PROTEIN INTAKE AND ITS ASSOCIATION WITH DEPRESSION, ANXIETY, AND STRESS AMONG IRANIAN WOMEN

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**Background and Aim:** Mental disorders are conditions that affect the usual function of the brain, causing a huge burden on societies. The causes are often unclear, but previous research has pointed out, as is the case with many other diseases, that nutrition could have a major role in it. Amino acids, the building blocks of proteins, are the main precursor of neurotransmitters (the chemical messengers in the brain) malfunction of which is heavily associated with a wide range of brain disorders

**Methods:** We assumed different sources of dietary protein could have different impacts on mental well-being. Hence, we decided to collect the nutritional data (with a validated and reliable semi-quantitative food-frequency questionnaire) from a sample of 489 Iranian women and investigate the association between animal and plant protein sources and the risk of depression, anxiety, and stress. Symptoms of these mental disorders were assessed using a validated Depression, Anxiety, and Stress Scales (DASS) questionnaire with 21 items.

**Results:** After multivariable adjustment, it was shown that women in the highest tertile of animal protein intake were more likely to show symptoms of depression (OR: 2.63; 95% CI: 1.45, 4.71; P=0.001), anxiety (OR: 1.83; 95% CI: 1.04, 3.22; P=0.03), and stress (OR: 3.66; 95% CI: 2.06, 6.50; p<0.001). While no significant association was seen between plant protein and any of the studied mental disorders.

**Conclusion:** Overall, our findings suggest that a diet high in animal protein could predispose individuals to mental illnesses.

**Keywords:** Protein, Amino acids, Depression, Anxiety, Stress, Mental health



## CONTRIBUTION OF DIET QUALITY TO RHEUMATOID ARTHRITIS RISK: A SYSTEMATIC REVIEW

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**Background and Aim:** Rheumatoid arthritis (RA) is a chronic debilitating autoimmune disease. Diet and nutrients have the potential to influence the onset and progression of RA. thus, this systematic review examines the relationship between diet quality with disease activity and incidence in individuals with RA.

**Methods:** PubMed, SCOPUS, Web of Science, Embase, Cochrane Library, and Google Scholar databases were searched up to May 2023 for observational studies without time limits by two independent reviewers. Duplicate and irrelevant articles were screened. The quality of the articles was assessed by the Newcastle-Ottawa assessment tools.

**Results:** From 438 retrieved articles, 11 articles (1 Cohort, 7 Cross-sectional, 3 Case-control studies) were included. 9 articles in this review that investigated the relationship between diet quality and the incidence of RA showed a significant relationship, also 3 out of 5 articles that examined the correlation between diet quality and disease activity showed a significant relationship.

**Conclusion:** It seems that adherence to a high-quality diet is an effective factor in the alleviation of the incidence and severity of RA.

**Keywords:** Diet quality; Diet quality indices; Rheumatoid arthritis



## GRAPE PRODUCTS INTERVENTION AND SELECTED CARDIOVASCULAR RISK FACTORS IN ADULTS: A SYSTEMATIC REVIEWS AND META-ANALYSIS OF 31 RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Although grape products can improve cardiovascular risk markers, but their effects are still controversial. The primary objective of the current meta-analysis was to conduct a comprehensive examination and evaluation of randomized controlled clinical trials (RCTs) that have investigated the effects of grape products on cardiovascular risk factors in the adult population.

**Methods:** A thorough search was conducted in multiple reputable databases including PubMed, Medline via Ovid, SCOPUS, EMBASE, and ISI Web of Sciences, spanning until the 20th of September 2023. We stratified studies according to the type of supplements: grape seed extract (GSE), raisin, grape powder (GP), pomace, juice and, wine

**Results:** The consumption of grape products was found to have a significant effect on low density lipoprotein cholesterol (LDL-C) (SMD=-0.29, 95% CI, -0.37, -0.21), Total Cholesterol (TC) (SMD=-0.26, 95% CI,-0.34, -0.18) , triglyceride (TG) (SMD-0.05, 95% CI, -0.12, -0.02), systolic blood pressure (SBP) (SMD=-0.55, 95% CI,-0.64, -0.47), and diastolic blood pressure (DBP) (SMD=-0.34 ,95% CI,-0.42 , -0.27) but had no significant impact on C-reactive protein (CRP) (SMD=- 0.11 ,95% CI,- 0.25 , 0.02). In subgroup analysis only consumption of GSE conducted significant reduction in LDL-C, TC, TG, SBP, DBP levels.

**Conclusion:** Further well-constructed randomized clinical trials are needed

**Keywords:** "Grape products"; "cardiovascular risk factors"; "Meta-Analysis".





## THE DIETARY PATTERNS DERIVED BY REDUCED-RANK REGRESSION IN ASSOCIATION WITH FRAMINGHAM RISK SCORE AND LOWER DASH SCORE IN HOVEYZEH COHORT STUDY

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**Background and Aim:** This study aimed to investigate the association between the four dietary patterns (DPs) derived from reduced-rank regression (RRR) and the risk of CVD predicted by the Framingham Risk Score (FRS) in the Arab residence of Khuzestan, Iran.

**Methods:** In this cross-sectional study, 5799 individuals aged 35–70 without a CVD diagnosis were selected among the participants of the Hoveyze cohort study (HCS). The Risk of CVD was assessed using the FRS model. A semi-quantitative food frequency questionnaire evaluated dietary intake. Four DPs were derived using RRR with 28 food groups as predictors and total protein (g/d), fiber(g/d), fat(g/d), and magnesium intake (mg/d) as response variables. Multinomial and binary logistic regression were used to assess the relationship of DPs with intermediate (10–20%) and high (> 20%) levels of FRS. Four primary DPs were derived, which explained 89.10 of the total explained variance in participants' dietary intake.

**Results:** After adjustment for potential confounders, higher tendency to 1st and 2nd DPs in Model 1, OR = 4.67 (95% CI 3.65; 6.01), OR = 1.42 (95% CI 1.13; 1.79) were presented accordingly. The 1st DP was associated with greater odds of CVD with the intermediate level of FRS. However, higher adherence to the 3rd and 4th DP, was associated with a lower risk of FRS.

**Conclusion:** Our findings confirm the current knowledge regarding the beneficial effects of healthy plant-based DPs and the avoidance of high-fat and processed foods to prevent CVD.

**Keywords:** "Dietary Patterns"; "FRS"; "CVD"



## FROM MICROBIOTA TO GLYCAEMIC CONTROL: EXPLORING PROBIOTICS AS A PROMISING AP- PROACH IN TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW"

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**Background and Aim:** Type 2 diabetes mellitus (T2DM) is one of the most substantial metabolic diseases that characterized by chronic hyperglycemia. Since the gut–liver axis plays an important role in the pathogenesis of metabolic disorders such as diabetes, the probiotics efficacy for the treatment of T2DM are investigated by number of studies. Probiotics are living microorganisms that confers a health benefit on the host. This review explores probiotics as a biotherapeutic option for T2DM.

**Methods:** This review article was performed through PubMed, Science Direct, Google Scholar, SID, and Cochrane until November 2023. The keywords were type 2 diabetes mellitus, probiotics, and microbiota. Among the 76 articles found in this regard, 48 related articles were used at the end.

**Results:** Many studies demonstrate that probiotics have beneficial effects on T2DM patients such as strengthening intestinal integrity, reducing inflammations and enhancing insulin sensitivity. Suggested mechanisms of probiotics are as follows: 1) Increase of incretin secretion that is impaired in T2DM patients 2) Short chain fatty acids production which stimulate intestinal gluconeogenesis and gut wall integrity 3) Bile acid transformation that has insulin sensitizing effect 4) Regulation of adipose tissue via LPS-mediated inflammation. Some studies results showed synbiotic food had vital effects on insulin, HOMA-IR and triglycerides. Fermented milk decreased inflammatory cytokines and increased SCFA in diabetic patients. *Lactobacillus acidophilus*, *Streptococcus thermophilus*, *Lactobacillus bulgaricus*, and/or *Bifidobacterium lactis* could improve glycemic control in adults with T2DM.

**Conclusion:** It seems that probiotics may have a beneficial glucose-lowering effect in T2DM patients.

**Keywords:** Type 2 diabetes mellitus; probiotics; microbiota



## COMPARISON OF THE DIETARY INFLAMMATORY INDEX AND CARDIOMETABOLIC RISK FACTORS IN PATIENTS WITH CORONARY SLOW FLOW AND HEALTHY CONTROLS

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**Background and Aim:** There are few data on the role of dietary factors in coronary slow flow phenomenon (CSFP). Dietary inflammatory potential may be correlated with cardiometabolic risk factors, which in turn are associated with CSFP. The present study aimed to investigate differences in dietary inflammatory index (DII) and cardiometabolic factors between CSFP and healthy population.

**Methods:** In this cross-sectional study, 87 participants (42 in the CSFP and 45 in the healthy group) with age > 18 years and BMI  $\geq$  25 were examined. DII was calculated on the basis of dietary intakes from a 3-day 24-hr food recall. FBG, anthropometric indices, lipid profile, and blood pressure were also measured.

**Results:** The energy-adjusted DII (E-DII) was significantly higher in the CSFP group compared to the control group ( $1.9 \pm 1.2$  vs.  $1.2 \pm 1.2$ ,  $p=0.02$ ). The final logistic regression model in this data set showed that E-DII was among independent risk factors for CSFP (AOR=1.73, 95% CI: 1.04-2.88,  $P=0.036$ ). An increased DII score was associated with a 73% higher risk of having CSFP. Additionally, DBP ( $81.8 \pm 10.5$  vs.  $74.3 \pm 11.5$ ,  $p=0.003$ ), FBG ( $112.2 \pm 24.6$  vs.  $99.7 \pm 16.3$ ,  $p=0.01$ ), TC ( $181.9 \pm 39.8$  vs.  $155 \pm 42.3$ ,  $p=0.003$ ), TG ( $172 \pm 91.2$  vs.  $133.5 \pm 49$ ,  $p=0.04$ ), HDL-C ( $50.2 \pm 13.6$  vs.  $40.2 \pm 9.4$ ,  $p<0.001$ ), and non-HDL-C ( $131.7 \pm 39.1$  vs.  $114.5 \pm 37.2$ ,  $p=0.04$ ) were significantly higher in the CSFP compared to the control group. No significant differences in other cardiometabolic risk factors were observed between the two groups.

**Conclusion:** Dietary inflammatory potential may be a novel risk factor associated with CSFP

**Keywords:** Coronary slow flow phenomenon; Dietary inflammatory index; Cardiometabolic risk factor



## ANTIOXIDANT AND ANTI-INFLAMMATORY EFFECTS OF GINGER IN COLORECTAL CANCER: A SYSTEMATIC REVIEW

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**Background and Aim:** Colorectal cancer (CRC) is the third most prevalent form of cancer worldwide, accounting for approximately 10% of all cancer cases and being the second leading cause of cancer-related deaths globally. Medical nutrition therapy plays a critical role in the treatment of CRC patients, with significant nutritional interventions being implemented. This systematic review aims to explore the impact of ginger supplements on the anti-inflammatory and anti-oxidant outcomes in CRC patients.

**Methods:** This systematic review examined articles published in PubMed, Science Direct, and Google Scholar until October 2023. The search utilized the keywords "ginger," "Anti-oxidant," "Zingiber officinale," "Z.officinale," "colorectal neoplasms," and "colorectal cancer." Among the 47 articles identified, the final selection included five articles that met the inclusion criteria. All selected articles were written in English.

**Results:** Ginger, acting as a cyclooxygenase (COX) inhibitor, demonstrated the ability to inhibit COX and reduce Prostaglandin E2 (PGE2) levels, potentially preventing CRC development. The ginger-treated group showed a significant decrease in free arachidonic acid levels and a significant increase in LTB4 levels after protein normalization. Ginger supplements increase enzymatic antioxidant activity and non-enzymatic antioxidant activity.

**Conclusion:** This systematic review demonstrates that ginger supplements not only reduce the levels of PGE2 and arachidonic acid but also increase the amount of LTB4. Ginger supplements increase enzymatic antioxidant activities, such as superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPx), and nonenzymatic antioxidant activity includes total glutathione (GSH/GSSG) were inclined to increase. Further research is necessary to uncover the anticancer effects of ginger.

**Keywords:** ginger, colorectal neoplasms, inflammation, dietary supplement, Antioxidant



## FORMATION OF CALCIUM OXALATE KIDNEY STONES IS RELATED TO CONSUMPTION OF SOME ULTRA-PROCESSED FOODS

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**Background and Aim:** The impact of ultra-processed foods on kidney stone disease risk remains unknown. This study was aimed at providing a relationship between the Ultra-Processed Food Consumption or its subgroups, and Calcium Oxalate Kidney Stones.

**Methods:** A case-control study was conducted among 366 individuals (183 cases and 183 controls) in Tehran. All the participants with confirmed renal stones, aged 18-65 years were included. Demographic and anthropometric information, medical history, physical activity, and dietary intake were collected by interview. The intake of UPF was assessed using a validated 147-item food frequency questionnaire and evaluated using the NOVA classification. Multivariate logistic regression was used to assess significant associations.

**Results:** In the adjusted models, Intake of sweets (ratio Chance: 2.12, 95% CI: 1.15-3.90,  $P=0.016$ ) was significantly higher in highest tertile of UPFs intake compared to the lowest. In addition, the participants who were in the highest tertile of receiving dairy items had a lower odds ratio of kidney stones than the participants in the first tertile (odds ratio: 0.53, 95% CI: 0.96 -0.29,  $P=0.034$ ). However, total intake of Ultra-processed foods did not have a significant relationship with the odds ratio of calcium oxalate kidney stones (odds ratio: 0.72, 95% confidence interval: 0.39-1.34,  $P$  for trend = 0.297).

**Conclusion:** Results of this study indicate that some UPF's subgroups (sweets and dairy items) are associated with calcium oxalate kidney stones risk.

**Keywords:** Ultra-Processed Food; Calcium Oxalate Kidney Stone; Kidney Stone Disease.



## **CURCUMIN EFFECTS ON GLYCAEMIC INDICES, LIPID PROFILE, BLOOD PRESSURE, INFLAMMATORY MARKERS AND ANTHROPOMETRIC MEASUREMENTS OF NON-ALCOHOLIC FATTY LIVER DISEASE PATIENTS: A META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS**

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**Background and Aim:** This systematic review and meta-analysis assesses the impact of curcumin, a potential NAFLD treatment, on glycaemic indices, lipid profiles, blood pressure, inflammation, and body measurements in NAFLD patients.

**Methods:** Studies published up to January 2024 were sourced from PubMed, SCOPUS, WOS, Science Direct, Ovid, and Cochrane. Following the 2020 PRISMA guidelines, the Joanna Briggs Institute Critical Appraisal Checklist was used for quality assessment. Effect sizes were calculated using a random-effects model, with WMD and 95% CI. Subgroup analyses identified heterogeneity sources.

**Results:** From 21010 records, 21 RCTs were included, comprising 1191 NAFLD patients (600 intervention, 591 control). Curcumin doses ranged from 50–3000 mg/day. Significant changes were observed in FBG, HOMA-IR, TG, TC, LDL, weight, and BMI, but not in HbA1C, plasma insulin, QUICKI, HDL, SBP, DBP, CRP, TNF- $\alpha$ , and WC. Limitations include potential bias and contamination of curcumin supplements. Subgroup analysis showed significant changes in serum FBG, TG, SBP, WC in RCTs  $\geq$ 8 weeks and in larger sample sizes.

**Conclusion:** Curcumin supplementation (50–3000 mg/day for 8–12 weeks) significantly improved FBG, HOMA-IR, TG, TC, LDL, weight, and BMI in NAFLD patients. Its safety as a complementary therapy is noted, but caution is advised due to potential biases and lack of independent product assessment. Future studies should consider NAFLD grades and ensure rigorous product analysis.

**Keywords:** Curcumin; Non-Alcoholic Fatty Liver Disease (NAFLD); Glycaemic Indices; Lipid Profile; Randomized Clinical Trials



## ASSOCIATION OF DIETARY AND LIFESTYLE INFLAMMATION SCORE WITH SLEEP QUALITY IN HEMODIALYSIS PATIENTS: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Diet and lifestyle exposures may affect the risk of sleep disorders as common problems among hemodialysis (HD) patients. We aimed to examine the association of dietary inflammation score (DIS), lifestyle inflammation score (LIS), and joint association (DLIS) with sleep disorders in HD patients.

**Methods:** This multicenter cross-sectional study was conducted on 423 maintenance HD patients with a mean age of 53.7±14.97 years. Dietary data of subjects were collected using a 168-item food frequency questionnaire. The DLIS was calculated using the DIS, calculated by data from 18 diet components, and three components of LIS including physical activity, body mass index (BMI), and cigarette smoking. Participants were assessed for sleep quality using the Pittsburgh Sleep Quality Index (PSQI). The odds ratio (OR) and 95% confidence interval (CI) of poor sleep quality across quartiles of the DIS, LIS, and DLIS were estimated by logistic regression analysis considering potential confounders.

**Results:** participants in the top quartile of DLIS score had greater odds of poor sleep quality (crude model: OR: 2.59; 95% CI: 1.49–4.51, P for trend<0.0001, adjusted mode: OR: 3.11; 95% CI: 1.64–5.88, P for trend<0.0001) compared with those in the first quartile. No significant associations were found between adherence to the LIS and DIS separately with sleep quality (P>0.05).

**Conclusion:** Our results suggest that a combination of pro-inflammatory dietary and lifestyle exposures may jointly be associated with poor sleep quality in HD patients.

**Keywords:** diet, lifestyle, inflammation scores, sleep quality, Hemodialysis





## ASSOCIATION OF DIETARY AND LIFESTYLE INFLAMMATION SCORE WITH MENTAL HEALTH IN HEMODIALYSIS PATIENTS: A CROSS-SECTIONAL STUDY

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**Background and Aim:** Psychological disorders are common issues among hemodialysis (HD) patients. Previous studies have suggested a positive association between a more pro-inflammatory diet and lifestyle- factors with mental health disorders. We aimed to examine the association of dietary inflammation score (DIS), lifestyle inflammation score (LIS), and joint association (DLIS) with psychological disorders (depression, anxiety, stress) in HD patients.

**Methods:** This cross-sectional study was conducted on 423 HD patients with a mean age of 53.7±14.97 years. Dietary data of subjects were collected using a 168-item food frequency questionnaire. The DLIS was calculated using the DIS, including 18 diet components, and three components of LIS including physical activity, body mass index, and cigarette smoking. Assessment of psychological disorders was also conducted by the validated Iranian version of the depression, anxiety and stress scale questionnaire (DASS-21). The odds ratio (OR) and 95% confidence interval (CI) of psychological disorders across quartiles of the DIS, LIS, and DLIS were estimated by logistic regression analysis considering potential confounders.

**Results:** In the fully adjusted model, participants in the highest quartile of DLIS score had greater odds of depression (OR: 2.70; 95% CI: 1.30, 5.63), anxiety (OR: 2.19; 95% CI: 1.09, 4.40), and stress (OR: 1.88; 95% CI: 0.84, 4.16) compared with those in the first quartile. No significant associations were found between adherence to the LIS and DIS separately with mental health ( $P>0.05$ ).

**Conclusion:** Our findings showed that a higher inflammatory potential of diet and lifestyle was related to increased incidence of mental health disorders in HD patients.

**Keywords:** diet, lifestyle, inflammation scores, mental health, Hemodialysis





## ASSESSING HOUSEHOLD VULNERABILITY TO FOOD INSECURITY DURING COVID-19 IN TABRIZ, IRAN

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**Background and Aim:** Covid-19 affected food security of many households. Iran was also one of the countries that was affected by this problem. The aim of this study is to identify and rank the different aspects of Tabriz households' vulnerability to food insecurity.

**Methods:** This study was conducted in 2022 in Tabriz, Iran .A standard online questionnaire was used for data collecting. The Household Food Insecurity Access Scale was used to assess food insecurity levels, and first-order structural equation modelling was applied to determine factors that affect food insecurity. Five items of vulnerability were measured: social, cultural, economic, physical, psychology.320 families residing in Tabriz province, selected randomly for this research.

**Results:** About 41 % of the total sample faced food insecurity. Economic and psychological aspects of vulnerability had the highest effect on food insecurity during the initial COVID-19 lockdown.

**Conclusion:** policymakers must provide economic support to identified vulnerable households. Changes in lifestyle and nutrition are also effective in reducing food insecurity. Economic sanctions against Iran impress this issue and abolition of them should be implemented to reduce vulnerability to food insecurity with COVID-19 in this country.

**Keywords:** Covid-19- household- food insecurity



## DOES DIETARY SUPPLEMENTATION IMPROVE MORTALITY AND CLINICAL STATUS IN SEPSIS: A SYSTEMATIC REVIEW

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**Background and Aim:** The goal of the present systematic review was to assess the effects of different dietary supplements on the mortality and clinical status of adults with sepsis.

**Methods:** We searched PubMed, EMBASE, and the Cochrane Library Central Register of Controlled Trials until February 2023. The primary outcome was short-term mortality, and the secondary outcomes were long-term mortality, length of ICU and hospital stays, and need for mechanical ventilation (MV).

**Results:** Finally, 64 studies with 30,885 participants met the criteria. In general, approximately none of intervention was effective in comparison to control group, except for magnesium, which had a beneficial effect on short-term mortality. About our secondary outcomes, vitamin C and the combination of the eicosapentaenoic acid, gamma-linolenic acid, and antioxidants was effective in terms of duration of MV, hospital, and ICU length of stays.

**Conclusion:** In sepsis situation, almost all dietary supplements had no beneficial effect on mortality. Further investigation on the use of dietary supplements for sepsis should be highly discouraged.

**Keywords:** Sepsis, Dietary supplements, Nutrition, Septic shock, Intensive care unit



## THE POTENTIAL OF PROBIOTICS IN CHEMOTHERAPY-INDUCED GASTROINTESTINAL COMPLICATIONS MANAGEMENT IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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**Background and Aim:** Acute lymphoblastic leukemia (ALL) accounts for one-third of childhood cancers in developed societies. Chemotherapy is one of the successful treatment options for ALL with a cure rate of about 90% in children worldwide. However, intensive chemotherapy may have long-term effects on the gastrointestinal microbiota through direct damage, disruption of colonization, and increased growth of pathogens; This dysbiosis can lead to many digestive complications, which can increase the duration of hospitalization and treatment costs, delay or stop chemotherapy treatment. It also may cause anorexia, weight loss, nutritional deficiencies, electrolyte imbalance and dehydration. All these can worsen disease prognosis, reduce the quality of life and finally cause chemotherapy-induced death. Also, drug treatments of these complications can have the risk of interactions, drug dependence, and side effects. Probiotics are active microorganisms that can be effective in regulating dysbiosis. This narrative review reviews studies on the effect of probiotics on chemotherapy-induced gastrointestinal complications in children with ALL.

**Methods:** Searches were conducted in PubMed, Scopus and Web of Science databases during 2019-2023.

**Results:** It seems that probiotics can be effective in reducing gastrointestinal complications via intestinal barrier improvement, stimulation of the salivary glands, regulating the immune system, producing short-chain fatty acids, and reducing pathogens.

**Conclusion:** The prescription of probiotics can be considered a useful supportive factor in the treatment of patients with ALL. Also, the evidence shows that the use of the Lactobacillus strain in the induction phase of chemotherapy can be significantly effective in reducing digestive complications, especially diarrhea and constipation. however, more studies are needed.

**Keywords:** Acute lymphoblastic leukemia, probiotic, chemotherapy, side effects, gut microbiota



## INVESTIGATING BREAKFAST CONSUMPTION BEHAVIOR IN STUDENTS: APPLICATION OF SOCIAL COGNITIVE THEORY

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**Background and Aim:** Breakfast as an important meal is related to maintaining the health of adolescents. The purpose of this study was to investigate the quantitative and qualitative status of breakfast consumption behavior and its relationship with social cognitive theory constructs among 7<sup>th</sup> and 8<sup>th</sup> grade female students in Kovar city

**Methods:** Data was collected by completing the breakfast recall questionnaire and social cognitive theory constructs scale in 406 students and was analyzed using SPSS and NUT4 software.

**Results:** The body mass index of 64.3% of the students was within the normal range. More than 90% of the mothers were literate and 97.3% of them were housewives. About 35% of students rarely or sometimes had breakfast, of which 21.4% prepared their own breakfast. The place of having breakfast for 50% of the participants was on the way or at school. The frequency of breakfast consumption behavior showed a significant positive relationship with knowledge and social support ( $p=0.01$ ), self-efficacy and self-regulation ( $p=0.05$ ). The average energy intake from breakfast was 242.8 kcal, which was equivalent to 12.51% of the required energy. the group of vegetables (0.31) and fruit (0.09); And the group of bread and cereals (1.4) constituted the lowest and highest average units consumed by students in the breakfast meal, respectively

**Conclusion:** Considering the relationship between the important constructs of the model and the frequency of eating breakfast, it can be hoped that interventions designed based on the model with the aim of improving the quality of breakfast (content) will also be effective.

**Keywords:** Breakfast Consumption, Social Cognitive Theory, Student



## FEASIBILITY STUDY OF PLANTING A PLANT WITH UNIQUE NUTRITIONAL PROPERTIES IN IRAN

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**Background and Aim:** Tartary buckwheat is the most important nutritional source in terms of macronutrients and micronutrients. Buckwheat protein is mainly composed of digestible albumins and globulins, and the absence of gluten is one of its other characteristics; Therefore, the main question is whether this non-native plant has the ability to plant, grow and harvest in Iran?

**Methods:** In order to assess the feasibility of planting this wheat in the country, we chose Kohgiluyeh and Boyer-Ahmad province due to having cold and tropical regions. First, we selected two good varieties for planting. In order to prepare the land, the land was first plowed and then leveled. The next step was to implement the planting plan on the ground and then weigh and getting envelopes of seeds for planting

**Results:** In the tropical region of the first planting, due to extreme heat, almost 70% of the field turned yellow and dried up, and in the third week, the rest of the field failed to flower. On the date of the second planting in tropical region, we saw a more favorable situation, which was due to the decrease in daily temperature and night watering of this field. In cold region, on both planting dates, due to the favorable air and soil temperature, it had very good early green growth and appropriate initial vegetative growth caused this line to sprout on time

**Conclusion:** The results showed that it is possible to grow buckwheat in Iran

**Keywords:** Buckwheat, Planting, Nutritional properties



## THE EFFECTS OF KETOGENIC DIET AND HIGH-INTENSITY INTERVAL TRAINING ON BRAIN AGING IN HEALTHY, OBESE AND OVERWEIGHT ADULTS USING DIFFUSION TENSOR IMAGING

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**Background and Aim:** Pathological changes associated with obesity alter the uniformity of brain white matter neural networks, as shown by diffusion tensor imaging (DTI). The increase in mean diffusion (MD) and decrease in fractional anisotropy (FA) in DTI observed in obese subjects may be due to destruction of neural structures. This study aimed to investigate the effect of high-intensity interval training and a ketogenic diet on brain aging in obese and overweight adults using DTI.

**Methods:** The participants were divided into three groups: control, HIIT group, which only performed the training protocol, and HIIT+ ketogenic group, which followed both training and a ketogenic diet. The intervention duration was 6 weeks. The training protocol consisted of a 30-40 minute training session three times a week. The diet protocol was a standard ketogenic diet based on body weight. A urine ketone test strip used to compare the presence of ketones in all groups. The subjects were examined at the Brain Mapping Centre of Tehran University using DTI.

**Results:** The results showed that there was a significant difference between the mean MD and FA values in the HIIT and HIIT + ketogenic groups compared with the control. Mean MD decreased significantly ( $p < 0.05$ ) in the HIIT and HIIT + ketogenic groups, whereas mean FA increased significantly ( $p < 0.05$ ) in the HIIT and HIIT + ketogenic groups.

**Conclusion:** This study demonstrated that a ketogenic diet and HIIT had a positive impact on the uniformity of white matter by altering the MD and FA values. This may slow brain aging in obese individuals.

**Keywords:** ketogenic diet; High-Intensity Interval Training; obesity; Diffusion tensor imaging; brain aging



## EVALUATING THE EFFECT OF DIGITAL GAME-BASED NUTRITION EDUCATION ON ANEMIA INDICATORS IN ADOLESCENT GIRLS: A RANDOMIZED CLINICAL TRIAL

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**Background and Aim:** Iron deficiency anemia is the most common type of micronutrient deficiency in the world. Adolescence represents a period of increased risk of iron deficiency. Therefore, we aimed to determine the impact of nutrition education by a digital game on markers of iron-deficient anemia in adolescent girls.

**Methods:** In this study, 176 adolescent girls were randomly dichotomized into the intervention and control groups. At the beginning and the end of the intervention, knowledge, attitude, and practice of both groups were assessed by a questionnaire. Girls in the intervention group received the necessary education through a digital game during a 14-week period, while those in the control group received basic nutritional education through PowerPoint and pamphlets. Additionally, serum transferrin, serum iron, transferrin saturation, ferritin, CBC difference, and total iron binding capacity (TIBC) tests were checked.

**Results:** In this study, nutrition education significantly increased the level of knowledge, attitude, and practice of adolescent girls regarding their diet ( $p \leq .05$ ). Hemoglobin level was also significantly raised ( $p \leq .05$ ). However, no significant effect was observed on other markers of iron-deficient anemia, such as serum iron, TIBC, and hematocrit, in the intervention group compared with the control group ( $p \geq .05$ ).

**Conclusion:** The results of this study indicated the positive impact of nutrition education based on digital game on knowledge, attitude, and practice scores, as well as a significant difference in hemoglobin. It is recommended that educational games be designed for students in the future to promote health and nutrition information.

**Keywords:** adolescents, digital games, iron deficiency anemia, nutrition education



## OPTIMIZING THE PRODUCTION OF FUNCTIONAL SOUP POWDER FROM A TRADITIONAL FERMENTED FOOD BASED ON GRAINS AND VEGETABLES

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**Background and Aim:** Ash-Kardeh is a traditional fermented product based on grains and domestic vegetables, which bacteria are mainly from the family of lactic acid bacteria, but uncontrolled fermentation can be the source of various contaminations during the traditional production of this product

**Methods:** 33 Ash-Kardeh samples were collected from different parts of Kohgiluyeh and Boyer-Ahmad province. The pH and humidity content of the samples were measured, then the total count of form, coliform group, total count, mold and yeast count was carried out. Biochemical and physio morphological tests along with 16S rRNA molecular method were performed to identify lactic acid bacteria

**Results:** The mean  $\pm$  standard deviation of pH and humidity of the samples were ( $3.50 \pm 0.33$ ) and ( $91.50 \pm 2.97$ ), respectively. Among 22 isolates (66.7%) of Staphylococcus bacteria and 11 isolates (33.3%) of Gram-negative isolates, a selective starter was made. Finally, using the selected starter, the Ash-Kardeh was industrially produced and turned into powder by lyophilization method. Based on the findings of the sensory evaluations, Functional soup won a higher score compared to traditional soup due to the high concentration of Ash-Kardeh and the preservation of flavor and taste

**Conclusion:** Due to its therapeutic application and pleasant taste, this product has the ability to be offered to the market as a functional soup with nutraceutical properties with a long shelf life

**Keywords:** Traditional fermented food, Ash-Kardeh, Functional





## OPTIMIZING THE PRODUCTION OF HEALTH-ORIENTED YOGURT DRINK (DOOGH) FROM A VARIETY OF TRADITIONAL FERMENTED PRODUCT "RICHAL"

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**Background and Aim:** Richal is a traditional dairy-based fermented product that is traditionally prepared from fermented milk, several different plants and some salt inside the musk. Considering the production of Richal by the domestic and the unsanitary nature of the musk production process, the presence of microbial contamination in this product is not far from expected

**Methods:** 77 lactic bacteria and 11 yeasts were isolated from three Richal product samples (collected from the south of Kohgiluyeh and Boyer-Ahmad province) and the morphophysiological, biochemical, technological, antimicrobial, genetic (16S rRNA and 26S rRNA) and symbiosis properties of both groups were investigated

**Results:** Among the isolates, a starter consisting of two lactic bacteria *L. plantarum* and *L. pentosus* and a yeast *Chloromyces marcianus* was produced, which had strong antimicrobial properties, a unique musky taste, and high viability. It is worth mentioning that the salt tolerance test and Sherman test (temperature tolerance) were also performed for this starter and it was found that it has a salt tolerance of 0-6% and a thermal shock tolerance of 60 degrees Celsius for 30 minutes

**Conclusion:** The industrial production of Richal's health-oriented yogurt drink by using domestic starter can prevent the removal of genetic reserves and market a new product with a traditional and native taste, which, due to its high antimicrobial properties, improves the digestive system

**Keywords:** Doogh, Starter Culture, Richal



## ASSOCIATION BETWEEN DIETARY MAGNESIUM INTAKE AND PROTEINURIA

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**Background and Aim:** Proteinuria is a medical disorder where there is an excessive amount of protein in the urine. The outcome is caused by two mechanisms involving the aberrant movement and release of proteins due to increased capillary wall permeability in the glomerulus, followed by the disturbance of their reabsorption in the proximal renal tubules. Severe kidney injury is indicated by the presence of significant albuminuria or proteinuria. Furthermore, certain studies claim that proteinuria may intensify the deterioration of renal cells and contribute to the advancement of renal disease through the stimulation of interstitial fibrosis. Empirical data has demonstrated that dietary factors and specific nutrients have a significant impact on the reduction of proteinuria. Magnesium is an important electrolyte that may have a connection to CKD and proteinuria. Proteinuria has been found to be one of the independent risk factors for hypomagnesemia, which is most common in CKD patients. However, prior researches mostly examined the correlation between serum magnesium levels and proteinuria, and there is a scarcity of data regarding the association between dietary magnesium intake and this condition. Therefore, the inquiry is if the consumption of magnesium through diet may be associated with proteinuria. For this reason, we choose to utilize the food intake data of patients from our earlier work ( DOI:10.1053/j.jrn.2021.01.027 ) , to assess the potential independent association between dietary magnesium consumption and proteinuria.

**Methods:** Our study included 90 individuals with proteinuria who were instructed to record their dietary consumption over a 24-hour period for three days each week using a questionnaire. The urinary protein to creatinine ratio (UPCR) was tested in a random urine sample as an indicator of proteinuria. We have discovered a significant negative relationship between the consumption of magnesium in one's diet and the presence of proteinuria. The statistical analysis yielded a beta coefficient of -0.222 and a p-value of 0.028. This correlation remained statistically significant even after controlling for potential confounding factors, including gender, age, eGFR, BMI, systolic blood pressure, history of diabetes mellitus, dietary consumption of energy, phosphorous, sodium, potassium,



and medication use. There are various ways to approach the inquiry of how magnesium prevents proteinuria and the progress of CKD, based on data from previous research. Magnesium has the potential to directly or indirectly impact the occurrence of proteinuria and the course of CKD. This element exerts direct protective effects on endothelial cells. The animal and cell studies have demonstrated that a lack of magnesium negatively impacts the functioning of endothelial cells. This deficiency leads to increased inflammation and oxidative stress, as well as heightened expression of prothrombic factors like vascular cell adhesion molecule-1 and plasminogen activator inhibitor-1. The presence of these inflammatory substances disrupts the ability of blood vessels to dilate in response to the endothelium, leading to inadequate blood flow to the kidney and causing damage to the glomerular membrane. This damage leads in the presence of protein in the urine and the advancement CKD. Magnesium's ability to mitigate phosphorus poisoning can indirectly contribute to the reduction of CKD progression and proteinuria. It has the ability to form a bond with phosphorus in the intestine, so preventing the absorption of phosphorus from the diet. Hence, a diet deficient in magnesium enhances the accessibility and bioavailability of phosphorus in the gut. Conversely, a diet low in magnesium can impact the proximal tubule and impair the elimination of phosphorus through urine, resulting in an accumulation of phosphorus in the blood. This can contribute to further kidney damage and an elevated mortality rate. Nevertheless, it is imperative to validate these acquired findings through human trials.

**Conclusion:** Present observational study was one of the pioneering investigations to demonstrate a significant inverse correlation between dietary magnesium consumption and proteinuria. However, future prospective cohort studies or clinical trials may provide a more comprehensive understanding of this association.

**Keywords:** Dietary; Magnesium; Proteinuria; Chronic kidney disease



## THE EFFECT OF LIRAGLUTIDE INTERVENTION ON WEIGHT REGAIN AFTER BARIATRIC SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Overweight and obesity are the fifth leading cause of death worldwide, contributing to nearly 3.4 million deaths each year. Currently, bariatric surgery is considered the most effective treatment option for people with obesity. There have been limited clinical studies investigating the impact of GLP1-RAs on weight regain after bariatric surgery

**Methods:** A systematically searched was done for articles published up to October 2022 in PubMed/Medline, Scopus, and EMBASE. The overall effect size was estimated by weighted mean difference (WMD) and 95% confidence interval (CI), in a random effect meta-analysis

**Results:** In the final quantitative analysis, the meta-analysis considered 5 randomized controlled trials (RCTs) with 286 participants. Based on the random effects model, liraglutide can diminish weight up to 4 kg in spite of the fact that this impact was not significant (WMD: -4.18 kg; 95% CI, -8.74 to 0.39; P= 0.07). Subgroup analysis showed a significant reduction in weight was observed in trials that injected liraglutide < 3 mg/d (WMD: -4.31 kg; 95% CI, -6.07 to -2.55; P< 0.001).

**Conclusion:** According to the results of our meta-analysis, liraglutide does not seem to be effective in weight loss after bariatric surgery. Further high-quality studies with larger sample size are required to assess the efficacy of liraglutide on weight loss in patients after bariatric surgery.

**Keywords:** Liraglutide\_ bariatric surgery\_ weight regain



## EFFECTS OF OLEOYLETHANOLAMIDE SUPPLEMENT ON GLYCEMIC STATUS, OXIDATIVE STRESS, INFLAMMATORY FACTORS, AND ANTI-MULLERIAN HORMONE IN WOMEN WITH POLYCYSTIC OVARY SYNDROME

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**Background and Aim:** Objective: Polycystic ovary syndrome (PCOS) is a prevalent hormonal disorder in young women. Oleoylethanolamide (OEA) showed anti-inflammatory properties in previous studies. The present study aimed to investigate the effect of OEA supplement on glycemic status, oxidative stress, inflammatory factors, and anti-Mullerian hormone (AMH) in women with PCOS.

**Methods:** Method: This study was a randomized clinical trial, double-blinded, placebo-controlled that was carried out on 90 women with PCOS. Patients were divided into two groups: receiving an OEA supplement (n=45) or a placebo (n=45). The intervention group received 125 mg/day OEA and the placebo group received the wheat flour for 8 weeks. Demographic data were collected through questionnaires. Fasting blood sugar (FBS), insulin resistance (IR), total antioxidant capacity (TAC), malondialdehyde (MDA), C- reactive protein (CRP), tumor necrosis factor-alpha (TNF- $\alpha$ ), and AMH were measured before and after the study.

**Results:** Results: Data analysis of food recall and physical activity questionnaires, showed no significant differences between the two groups ( $p < 0.05$ ). Biochemical factors including glycemic status, MDA, inflammatory factors, and AMH decreased significantly ( $p < 0.05$ ). TAC increased remarkably ( $p < 0.05$ ) in comparison between the two groups, after the intervention.

**Conclusion:** Conclusion: OEA supplement with anti-inflammatory characteristics could be efficient independent of diet changes and physical activity in improving disrupted biochemical factors, so both supplementation or food resources of this fatty acid could be considered as a compensatory remedy in patients with PCOS.

**Keywords:** Keywords: Oleoylethanolamide; glycemic status; inflammation; anti-Mullerian hormone; polycystic ovary syndrome



## ASSOCIATION BETWEEN DAIRY CONSUMPTION AND POOR QUALITY OF LIFE: A CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Quality of life (QoL) is important for maintaining people's physical health. A healthy lifestyle and proper nutrition can improve the quality of life and prevent diseases. Dairy products are important for health because they have diverse and rich nutrients. Therefore, this study aims to investigate the relationship between dairy consumption and poor quality of life.

**Methods:** This cross-sectional study involved 604 adults aged 18 to 65 from different regions of Iran. A validated food frequency questionnaire was used to collect data on dairy intake. Health-related QoL was assessed by the short form 12 Survey-version 2 (SF-12v2) questionnaire. Logistic regression was used to analyze the relationship between dairy consumption and poor quality of life in crude and adjusted models.

**Results:** In the crude model, no significant relationship between dairy consumption and poor quality of life (OR = 1.083; 95% CI = 0.650-1.806; P = 0.759) was observed. After adjusting for confounding factors including of age, gender, smoking status, BMI (Body Mass Index), and energy intake, no significant association was observed.

**Conclusion:** No significant relationship was found between dairy consumption and poor quality of life. It seems that there is a need for more studies in this field.

**Keywords:** Dairy Consumption; Quality of life; Cross-sectional; IRAN



## THE EFFECT OF GENISTEIN SUPPLEMENTATION ON GLYCAEMIC INDICES AND SOME CARDIOVASCULAR FACTORS IN ADULTS: A GRADE-ASSESSED SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** This study investigates the impact of genistein supplementation on markers of glucose control, insulin sensitivity, and cardiovascular health. In response to divergent findings in extant clinical trials, we conducted a comprehensive analysis of 16 randomized clinical trials (RCTs) to assess genistein's association with glycemic control and cardiovascular risk factors.

**Methods:** A systematic search was executed across multiple databases, including SCOPUS, PubMed, Medline via Ovid, ISI Web of Science, and Google Scholar, up to July 2023. The outcomes of interest encompassed glycemic control indices such as blood glucose, insulin, insulin resistance (HOMA-IR), insulin sensitivity (QUICKI), and hemoglobin A1c (HbA1c), along with cardiovascular factors including C-reactive protein (CRP), fibrinogen, and adiponectin. Effect sizes were calculated using weighted mean difference (WMD) and 95% confidence intervals (CI).

**Results:** Our analysis, incorporating 16 trials with 1486 participants, revealed a significant reduction in blood glucose (WMD:  $\approx 6.09$  mg/dl, 95% CI:  $\approx 7.42$ ,  $-4.76$ ,  $p < 0.001$ ), insulin (WMD:  $-9.87$  pmol/l, 95% CI:  $\approx 12.37$ ,  $-7.38$ ,  $p < 0.001$ ), HOMA-IR (WMD:  $-0.48$ , 95% CI:  $\approx 0.54$ ,  $-0.40$ ,  $p < 0.001$ ), and fibrinogen (WMD:  $\approx 61.60$  mg/dl, 95% CI:  $\approx 71.50$ ,  $-51.71$ ,  $p < 0.001$ ). No significant impact was observed on HbA1c, QUICKI, CRP, and adiponectin. Subgroup analysis highlighted a significant effect on blood glucose in participants with a baseline of  $\approx 100$  mg/dl. Notably, a reduction in blood glucose, insulin, and HOMA-IR was evident in subjects with a BMI  $< 30$  kg/m<sup>2</sup>.

**Conclusion:** Genistein supplementation exhibits positive effects on glycemic control and reduces plasma fibrinogen, while showing no significant impact on CRP and adiponectin levels.

**Keywords:** Genistein, Glucose, Insulin resistance, Cardiovascular markers



## INVESTIGATING DIETARY PATTERNS AND THE STATUS OF NON-COMMUNICABLE DISEASES IN PATIENTS WITH BLOOD LIPID DISORDERS IN THE RESEARCH POPULATION

Tahereh Teimori

**Background and Aim:** Considering the effect of nutrition on non-communicable diseases, this study was conducted with the aim of investigating the dietary pattern of people with blood lipids and the status of non-communicable diseases in the studied population.

**Methods:** A cross-sectional study was conducted on 300 patients with hyperlipidemia, and the participants were those who visited the health centers of Alvand city by simple random method. The data was collected with a semi-quantitative FFQ food frequency questionnaire. The findings were analyzed by SPSS 24 software

**Results:** Among the three healthy, unhealthy, and moderate dietary patterns in this study (66.3%) followed the median dietary pattern. There was a correlation between people's eating patterns and non-communicable diseases ( $P < 0.05$ ). There was a significant relationship between dietary pattern and education level ( $P < 0.05$ ). There was no significant relationship ( $P > 0.05$ ) between dietary pattern and BMI of the participants. There was no significant relationship between people's age, marital status and their eating pattern ( $P > 0.05$ ). It seems that modifying people's eating pattern is effective in preventing non-communicable diseases.

**Conclusion:** Most of the participants followed a moderate or normal eating pattern. People who follow an unhealthy eating pattern have more non-communicable diseases. People with a higher level of education had a healthier eating pattern. It seems that modifying the food pattern can be effective in preventing other non-communicable diseases in the future.

**Keywords:** Food patterns, lipid disorders, non-communicable diseases





## ASSOCIATION BETWEEN HIGH LEVELS OF LOW-DENSITY LIPOPROTEIN (LDL) AND ANTHROPOMETRIC MEASUREMENT AMONG THE MASHAD STUDY POPULATION

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**Background and Aim:** This study aimed to evaluate the association of anthropometric indices and hyper-low-density lipoprotein (LDL) cholesterolemia among the MASHAD study population.

**Methods:** This is a cross-sectional study on phase 1 of Mashhad Stroke and Heart Atherosclerotic Disorder (MASHAD) study. The relationship between high LDL levels and anthropometric indices containing: BRI (body roundness index), LAP (Lipid Accumulation Product), AVI (Abdominal volume index), Waist to height ratio, and Waist to hip ratio, were assessed; using logistic regression (LR).

**Results:** A total of 9704 individuals was incorporated in the study, which among them 29% of males and 35% of females had LDL levels  $\geq 130$  mg/dl. There was a significant association between BRI, AVI, Waist height ratio, Waist to hip ratio, and LAP, and LDL cholesterolemia ( $P < 0.001$  for all).

**Conclusion:** BRI, AVI, Waist to height ratio, waist to hip ratio, and LAP were significantly associated to hyper LDL cholesterolemia. These novel anthropometric indices may be useful for early diagnosis and treatment of dyslipidemia.

**Keywords:** body roundness index; Lipid Accumulation Product; Abdominal volume index; LDL cholesterolemia



## THE EFFECTS OF URSODEOXYCHOLIC ACID ON ANTHROPOMETRIC MEASUREMENTS, BLOOD PRESSURE, AND INFLAMMATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Chronic diseases such as obesity, hypertension, and metabolic syndrome are major health concerns worldwide. Ursodeoxycholic acid (UDCA) is a bile acid that is naturally produced in the liver and has been used for the treatment of various liver diseases. In this systematic review and meta-analysis, we looked into how UDCA might affect inflammation, blood pressure, and obesity.

**Methods:** Five major databases were searched from inception to February 2023. The investigated outcomes included body mass index (BMI), systolic blood pressure (SBP), diastolic blood pressure (DBP), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF- $\alpha$ ). A random-effects model was applied to estimate pooled weighted mean difference (WMD) with 95% confidence intervals (CI). The registration code is CRD42023428064.

**Results:** Twelve publications were included in the systematic review and meta-analysis. UDCA consumption significantly decreased BMI (WMD: -0.29 kg/m<sup>2</sup>, 95% CI: -0.58, -0.01, P=0.04), and DBP (WMD: -2.16 mmHg, 95% CI: -3.66, -0.66, P=0.005). It also increased SBP (WMD: 5.50 mmHg, 95% CI: 3.65, 7.35, P<0.001). However, there was no significant effect of UDCA on body weight (WMD: -0.3 kg, 95% CI: -1.3, 0.71, P=0.56). Moreover, UDCA consumption does not affect IL-6 and TNF- $\alpha$  levels.

**Conclusion:** This systematic review and meta-analysis suggest that UDCA supplementation has a lowering effect on BMI and DBP in adults, but increases SBP and has no effect on weight or inflammation. However, further long-term and well-designed RCTs are needed to confirm our findings.

**Keywords:** Ursodeoxycholic acid; Blood pressure; Body weight; Meta-analysis; Inflammation



## EFFECT OF SAFFRON SUPPLEMENTATION ON DEPRESSION

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**Background and Aim:** Introduction: saffron (*L.crocus sativus* Iridaceae), an ancient plant that attracted attention of many researchers these days .According to novel pharmacological researches saffron and it's bioactive constituents such as crocin, picocrocinn and safranal, have positive effect on cardiovascular system, depression, diabetes, atherosclerosis ,cancer , neurologic system and memory. Depression is a common mental health disease as a consequence of complexity psycho-neuro-endocrinological disorder with 8-20% prevalence in Iran.This disease is associated with mood disorder and constant sadness and loss of motivation Discover an optimal treatment is still a challenge. In this article, we will review whether saffron can be an alternative treatment for depression or not.

**Methods:** Methods: In this article we used just double blind randomized controlled clinical trials from 2006 till 2023 ,that have only used saffron powder for supplementation and not the trials that used aqueous and alcoholic saffron extract. The duration of supplementation in the studies that have been reviewed is 6- 12 weeks with an average dose of 30 milligrams (capsule of stigma of *crocus sativus*) in human subjects who have mild to moderate depression. These trials have used Hamilton depression rating scale (HDRS) and Beck's depression inventory (BDI-II) to evaluate depression in the studied subjects

**Results:** Result: Active ingredients of saffron reduce depression by modification serotonin and dopamine secretion in brain. According to the present review this plant has a significant effect on the treatment of depression severity

**Conclusion:** Conclusion:In conclusion more studies are needed to find an optimal dosage and confirm mechanism.

**Keywords:** Keywords : *Crocus sativus*; saffron; depression; crocin



## INVESTIGATING THE RELATIONSHIP BETWEEN STRESS, PHYSICAL ACTIVITY AND SOCIODEMOGRAPHIC FACTORS ON NUTRITIONAL HEALTH AND PROTEIN QUALITY AMONG EMPLOYEES OF MASHHAD UNIVERSITY OF MEDICAL SCIENCES

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**Background and Aim:** Malnutrition and muscle wasting are global concerns. One of the key elements pertaining to these worries is food intake. The present study was designed with the aim of investigating the relationship between stress, physical activity and sociodemographic factors on nutritional health and quality of protein consumption among employees of Mashhad University of Medical Sciences.

**Methods:** The current cross-sectional study was conducted using data from the PERSIAN cohort on 4572 employees of Mashhad University of Medical Sciences. HEI and PDCAAS indices were calculated based on the data collected by the food frequency questionnaire. The statistical method of conceptual model drawing and bootstrapping algorithm through PLS-SEM software has been used to analyze the variables.

**Results:** The study showed that increasing physical activity has a positive relationship with the quality of protein intake, but this relationship was not seen with HEI. In addition, Stress, anxiety, and depression were found to have a negative relationship with protein intake, but this relationship was not observed with HEI. Also, the results stated that with the increase in wealth, age and education status, the index of healthy eating and the quality of protein intake increases. The study also states that while men had a better quality of protein intake, the healthy eating index score was higher in women.

**Conclusion:** There may be a relationship between stress, physical activity and sociological factors with nutritional health and the quality of protein intake. Therefore, by making policies intended to lessen stress, anxiety and depression, as well as improving physical activity facilities, we can improve the quality of life.

**Keywords:** HEI; PDCAAS; DASS21; Physical activity



## CYTOTOXIC AND APOPTOTIC EFFECTS OF SWEET APRICOT (*PRUNUS ARMENIACA L.*) EXTRACT ON PANC-1 PANCREATIC CANCER CELLS

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**Background and Aim:** Pancreatic cancer is known as the most malignant tumor. Surgery and chemotherapy are potentially curative treatments for pancreatic cancer patients with a low response rate. Recently, a growing interest has been dedicated to natural products. Sweet apricot kernel exerts a number of pharmacological activities; however, the anti-cancer effect, related mechanisms and its active compounds were rarely investigated. In this research, we aimed to evaluate the cytotoxic/apoptotic effects of sweet apricot kernel ethanolic extract (SAEE).

**Methods:** The extract was prepared by maceration and its chemical composition analyzed by gas chromatography-mass spectrometry (GC-MS). The biological effects of SAEE on cancerous PANC-1 and 293/KDR normal cells were investigated by MTT assay, DAPI and AnnexinV/PI staining. The expression of pro- and anti-apoptotic genes was evaluated by Real-time q-PCR analysis.

**Results:** The SAEE showed selective growth inhibitory activity against PANC-1 cells in a dose- and time-dependent manner. DAPI staining and flow cytometry revealed nucleus fragmentation and elevation of apoptotic cells, respectively. Also, a significant decrease of Bcl-2/Bax ratio and up-regulation of caspase-3 expression indicated the induction of apoptosis in PANC-1 cells, but not in 293/KDR cells. These results suggest that SAEE could induce apoptosis in cancer cells via a mitochondrial dependent pathway. Furthermore, GC-MS analysis showed that the SAEE is rich in gamma-sitosterol and gamma-tocopherol.

**Conclusion:** Our findings suggest that due to the selective impacts of SAEE on PANC-1 cells, it could be considered as a promising adjuvant for pancreatic cancer therapy. Though, the potent anti-cancer effects of main components of SAEE should be further investigated.

**Keywords:** Pancreatic cancer, Sweet apricot kernel, Apoptosis,  $\gamma$ -sitosterol,  $\gamma$ -tocopherol



## INVESTIGATING THE MOTIVATIONAL AND INFLUENCING FACTORS ON CHOOSING FOOD ITEMS BY CITIZENS OF TABRIZ, IRAN

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**Background and Aim:** This study aimed to find appropriate nutritional factors and understand the motivation for food choices. We also investigated the factors affecting the purchase and consumption of food items among citizens of Tabriz, Iran.

**Methods:** In this cross-sectional descriptive study, 209 valid and reliable researcher-made questionnaires were randomly distributed among volunteer citizens of Tabriz.

**Results:** Price, health, and ease of cooking were the strongest determining factors for food choices, and the feeling of cheerfulness was the least influential factor. Also, there was a significant relationship between "nutrition and health information with different education levels", "information and weight control with different occupational groups", and "information and price with participant's income".

**Conclusion:** The researcher-made questionnaire used in this study had high validity. So, it can be used to determine the motivational and influencing factors in choosing food items in Iran.

**Keywords:** Purchase motivation; Food choices; Healthy diet



## ANIMAL PROTEIN SOURCES AND RISK OF INFLAMMATORY BOWEL DISEASES: A SYSTEMATIC REVIEW AND META-ANALYSIS OF COHORT STUDIES

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**Background and Aim:** We aimed to conduct this dose-dependent meta-analysis to examine the relation between animal protein and its sources with inflammatory bowel disease (IBD).

**Methods:** We searched databases, comprising PubMed/Medline, Web of Science (ISI), Embase, and Google Scholar, for the published studies up to March 28, 2023. Prospective cohort study designs that investigated associations between dietary intake of various animal protein sources and with risk of IBD in the general population were identified. Eleven prospective cohort studies with 4,302,554 participants and 8067 cases were considered eligible. Findings indicated that higher intake of dairy was significantly associated with a lower risk of IBD (RR: 0.81; 95% CI: 0.72, 0.90), Crohn's disease (RR: 0.69; 95% CI: 0.56, 0.86), and ulcerative colitis (RR: 0.84; 95% CI: 0.75, 0.94). There was no association between different sources of animal protein and the risk of IBD. The dose-response analysis suggested that each 100 g/d increment in dietary total meat consumption was associated with a 38% greater risk of IBD. Moreover, A positive linear association was found between total meat intake and risk of IBD ( $P_{\text{nonlinearity}}=0.522$ ,  $P_{\text{dose-response}}=0.005$ ).

**Conclusion:** Overall, among the dietary sources of protein, the risk of IBD increased only with increasing total meat intake, and the consumption of protein from dairy products was found to be a protective factor against the IBD risk.

**Keywords:** Animal protein, Inflammatory bowel diseases, Meta-analysis



## ASSOCIATION BETWEEN CARBONATED DRINK CONSUMPTION AND EXCESSIVE DAYTIME SLEEPINESS IN ADULTS: A CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Excessive daytime sleepiness is a widespread mental health problem that can affect daily functioning. Food groups may influence sleepiness, but the link between carbonated drink intake and sleepiness is unclear. Therefore, this study aimed to investigate the association between intake of carbonated drink and sleepiness in adults.

**Methods:** This cross-sectional study involved 604 Iranian adults from different regions. We measured carbonated drink intake using a standard Food Frequency Questionnaire (FFQ). A Persian translation of the Epworth Sleepiness Scale (ESS) was used to determine the excessive daytime sleepiness (EDS). We used logistic regression analysis in both unadjusted and adjusted models.

**Results:** The finding revealed that there was no significant association between the carbonated drinks intake and sleepiness in the crude model (OR: 1.641; 95% CI: 0.925-2.911; P-value=0.09). After adjustment of variables including age, gender, smoking cigarette, Body mass index (BMI), and energy intake, no significant relationship was observed between the carbonated drinks intake and sleepiness (OR: 1.529; 95% CI: 0.821-2.848; P-value=0.278).

**Conclusion:** This study did not find a significant link between carbonated drink intake and sleepiness. More research is required to investigate this topic further.

**Keywords:** Sleepiness; Cross-sectional study; Carbonated drinks; Iran





## THE EFFECTS OF SHORT CHAIN FATTY ACID-BUTYRATE ON EXPRESSION OF ANTI-INFLAMMATORY GENES PGC-1 $\alpha$ AND SIRT1 IN PATIENTS WITH ULCERATIVE COLITIS: A DOUBLE BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Short chain fatty acid butyrate may reduce the severity of ulcerative colitis (UC) by activating genes such as silent information regulator 1 (SIRT1) and peroxisome proliferator-activated receptor  $\gamma$  coactivator-1  $\alpha$  (PGC-1  $\alpha$ ) which responsible for biological processes including inflammation, apoptosis, and oxidative stress response. The present research aimed to assess for the first time the effect of butyrate supplementation on the expression of SIRT1 and PGC-1  $\alpha$  as potential factors in UC patients

**Methods:** In this double-blind, randomized parallel clinical trial, 30 individuals with mild-to-moderate active UC were divided into two treatment groups. Fifteen patients received 600 mg/kg/day of sodium butyrate, while the remaining 15 patients received a placebo for a duration of 12 weeks. The study obtained ethical approval from the Research Ethics Committee of Shiraz University of Medical Sciences under reference number IR. SUMS.SCHEANUT.REC1402057. The fold change expression rates of SIRT1 and PGC-1  $\alpha$  genes were assessed in the peripheral blood mononuclear cell (PBMC) by using the real-time polymerase chain reaction.

**Results:** We found that the expression of SIRT1 was significantly increased compared to placebo group ( $2.43 \pm 0.6$  vs.  $0.35 \pm 0.35$ ;  $p=0.041$ ). Although no significant differences in expression of PGC-1  $\alpha$  in butyrate group compared to placebo group ( $0.971 \pm 0.112$  vs.  $1.008 \pm 0.115$ ;  $p=0.376$  respectively) were seen.

**Conclusion:** It seems that butyrate supplementation may provide protection against inflammation in UC by modulating the expression of SIRT1 genes.

**Keywords:** : Butyrate, inflammation, IBD, ulcerative colitis, Gene expression, Sirt1



## THE EFFECTS OF SHORT CHAIN FATTY ACID-BUTYRATE ON THE EXPRESSION OF APOPTOSIS GENES, BCL2, BAX IN PATIENTS WITH ULCERATIVE COLITIS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL

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**Background and Aim:** Upregulation of apoptosis is a critical concern in ulcerative colitis (UC). Butyrate, a short-chain fatty acid, exhibits beneficial effects on apoptosis in colon cells by modulating gene expression. The aim of the present study was to assess the effect of butyrate supplementation on the expression of two key apoptosis-related genes, Bax and Bcl2 for the first time.

**Methods:** In this randomized clinical trial 30 patients with mild-to-moderate active UC were divided into butyrate group (15 patients received Na Butyrate (600 mg /day) and control group (15 patients received placebo) for 12 weeks period. The ethical approval study received from the Research Ethics Committee of Shiraz University of Medical Sciences with reference number: IR. SUMS.SCHEANUT.REC1402.057). The fold change expression of Bax and Bcl2 genes were examined in the blood by using the Real-Time PCR.

**Results:** The results revealed a significant increase in Bcl2 expression within the butyrate group compared to the placebo group ( $1.51 \pm 1.91$  vs.  $0.428 \pm 0.357$ ;  $p=0.01$ ) after 12 weeks supplementation. Although, there were no significant differences observed in the expression of Bax between the butyrate group and the placebo group ( $0.474 \pm 0.353$  vs.  $1.381 \pm 1.647$ ;  $p=0.187$ ).

**Conclusion:** The findings indicate that butyrate supplementation may have an effect on apoptosis regulation and cell survival in active UC

**Keywords:** IBD, Ulcerative colitis, Butyrate, apoptosis, gene expression, Bax, Bcl2



## THE PURPOSE OF THIS STUDY WAS TO EXMINE THE PREVALENCE OF EATING DISORDERS IN GIRL TEENAGERS ATHLETIES: THE ROLE OF ENTITLEMENT, PERFECTIONISM AND EMOTIONAL DYSREGULATION.

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**Background and Aim:** The purpose of this study was to examine the prevalence of eating disorders in girl teenagers athletes: the role of entitlement, perfectionism and emotional dysregulation.

**Methods:** For this field, 301 girl teenagers athletes selected by convenience sampling in Hamadan and filled out the entitlement, perfectionism, emotional dysregulation and eating disorders scales. The research method was correlation. Pearson correlation and regression were used for analyzing the data.

**Results:** Results indicated that 12.3 percent of girl teenagers athletes had symptoms of bulimia nervosa and 10.3 percent symptoms of anorexia nervosa. Results of Pierson correlation indicated that there was positive correlation between entitlement, negative perfectionism and emotional dysregulation with bulimia nervosa and anorexia nervosa. According to regression results, negative perfectionism and entitlement the predictive variables of symptoms of bulimia nervosa and entitlement, negative perfectionism and emotional dysregulation were the predictive variables of symptoms of anorexia nervosa.

**Conclusion:** Based on results attention to psychological strategies for decreasing the symptoms of eating disorders in girl teenagers athletes.

**Keywords:** eating disorders; emotional dysregulation; entitlement; perfectionism; teenagers



## THE RELATIONSHIP BETWEEN DEPRESSION AND INTAKES OF SNACKS AMONG UNIVERSITY STUDENTS AT AHVAZ JUNDISHAPUR UNIVERSITY OF MEDICAL SCIENCE

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**Background and Aim:** The effect of depression on many aspects of life causes various problems in human communities. Regarding that emotional problems such as depression may have effect on food intake, this research was conducted to study the relationship between depression and the kind and quality of the snack intake among university students.

**Methods:** This study was conducted on 173 university students at Ahvaz Jundishapur University of Medical Sciences. The severity of depression was measured by Beck depression questionnaire and students were divided into three groups: without depression, mild and medium to severe signs of depression. The quality of snack intake was determined using a valid designed questionnaire.

**Results:** More percent of girls showed medium to severe signs of depression compared with boys (18.4% and 9.8% respectively,  $P=0.047$ ). Also more percent of bachelor of sciences students (68.8%) suffered from depression compared with master of sciences (33.3%) and general doctoral or Ph.D. (41.9%) ( $P=0.003$ ). A significant relationship was observed between healthy and depression students on kind of snack intake; more healthy students (17.1%) had tendency to intake sour or spicy snacks ( $P=0.019$ ). Also more percent of students with medium to severe signs of depression (19.7%) compared with healthy ones (7.3%) never pay attention to expiration date and labels of food products ( $P=0.006$ ).

**Conclusion:** Results showed the relationship between depression and quality of food materials of the snacks. So this could show the importance of the healthy food intake among individuals with depression.

**Keywords:** Depression, Snack, University student



## THE EFFECTS OF CLIMATE CHANGE ON FOOD SECURITY IN IRAN AND STRATEGIES TO DEAL WITH IT IN IRAN AND OTHER COUNTRIES TO IMPROVING FOOD SECURITY: A NARRATIVE REVIEW STUDY

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**Background and Aim:** One of the challenges of the 21st century is the subject of climate fluctuations and changes, food security is the access of all people at any time in physical and economic dimensions, to nutritious and sufficient food, so that people are able to afford it.

**Methods:** In this study, a systematic search was conducted in databases, three examples of climate change studies and its effects on food security in Iran were extracted along with strategies to deal with it, and finally, these strategies were compared and analyzed with other countries. has been - The effects of climate change on food access: (food access): The effects and consequences of climate change on food importing countries will also be great because food exports may be reduced or prohibited in the event of extreme weather events. - The effects of climate change on food consumption: (food utilization): following the increase of climate change and the increase in food prices, the nutritional quality of diets will decrease, which will exacerbate obesity and health inequalities.

**Results:** The results of the literature review in this field, especially in Iran, indicate that societies need to choose a new approach and an integrated policy to protect natural resources against the consequences of climate change in order to reduce climate change.

**Conclusion:** Implementation of climate change adaptation strategies may reduce the negative effects under moderate climate change conditions.

**Keywords:** "food security""climate change"



## INTERACTION OF VITAMIN D RECEPTOR GENE FOKI VARIANTS AND PUFA W3 ON PERCEIVED STRESS SCORE: A CROSS-SECTIONAL STUDY

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**Background and Aim:** There is a high prevalence of perceived stress among nurses. Recent studies have shown that PUFA w3 and genetic variants contribute to perceived stress. This study aimed to examine interactions between vitamin D receptor (VDR) gene FokI polymorphism and PUFA w3 on perceived stress score .

**Methods:** A total of 268 Iranian nurses (248 women; 20 men) participated in this cross-sectional study. PUFA w3 and perceived stress score of participants were evaluated using a 3-day food record and the Perceived Stress Scale (PSS)-10, respectively. VDR FokI polymorphism was genotyped using the restriction fragment length polymorphism method.

**Results:** In carriers of ff genotype, lower intake of EPA was related to the elevated perceived stress score (P Interaction=0.06).

**Conclusion:** FokI polymorphism interacts with PUFA w3 (EPA to increase perceived stress score in nurses.

**Keywords:** PUFA w3; Eicosapentaenoic Acid, Docosahexaenoic Acids, Linoleic Acid, Vitamin D receptor; Receptors Calcitriol , Interaction



## INVESTIGATING CHANGES IN NUTRITIONAL LITERACY AND NUTRITIONAL STATUS INDICATORS IN A GROUP OF HEMODIALYSIS PATIENTS AFTER TWO MONTHS OF EDUCATIONAL INTERVENTION IN SHAHID MOSTAFA KHOMEINI HOSPITAL OF ILAM

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**Background and Aim:** Inadequate nutrition while receiving hemodialysis treatment is well known as one of the factors of treatment failure, which is significantly related to the level of nutritional literacy of individuals. Therefore, the present study was designed with the aim of investigating changes in nutritional literacy and indicators of nutritional status in a group of hemodialysis patients after two months of nutrition education.

**Methods:** This research was conducted as a single-centered interventional study on 84 hemodialysis patients of Ilam. Before starting the nutrition education, patients' data about demographic characteristics and the main variables, including nutritional literacy, blood profiles and anthropometric indices were gathered. Then the educational intervention was implemented for two months for all patients. Primary and secondary outcomes of the study were measured immediately after the completion of the intervention and consequently three months after that. Nutritional literacy level was assessed using DSNLS validated questionnaire. The average age of patients participating in the study was  $58.15 \pm 13.54$  years. The average score of the nutritional literacy level in the patients at the beginning of the study based on the mentioned questionnaire was  $10.2 \pm 1.50$  and at the end of the study was  $17.2 \pm 3.90$ . Three months after the end of the study, it was  $13.50 \pm 2.30$ . There were no significant changes in the status of anthropometric indicators including weight, BMI, arm circumference and skinfold thickness, but the changes in blood indicators were significant.

**Conclusion:** Nutrition education can lead to the improvement of specific nutritional literacy of patients, but due to the condition of their disease, there is a need for its continuing. The effect of above mentioned training can be very effective especially for controlling the status of laboratory values in such patients. In order to improve communication with the patients and to continue the education, it is recommended to use the remote education programs using new technologies

**Keywords:** Nutritional literacy, nutritional status, hemodialysis, education



## STAKEHOLDER ANALYSIS FOR AFFORDABLE AND SUSTAINABLE FOOD BASKETS IN IRANIAN SOCIETY-1402

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**Background and Aim:** Food baskets are used by policymakers and their stakeholders as a tool for formulating solutions to food and promotion issues. Sustainable food baskets Cost-effectiveness can be helpful in determining the food choices of people in the community.

**Methods:** The present study is a qualitative study with the aim of identifying the stakeholders of sustainable and affordable food baskets. Analysis of interviews with analysis approach the content was done using Maxqda 10 software version 2020. Using Ashmir's Stakeholder Analysis Guide Protocol in Stakeholder Analysis Studies, Stakeholder Position Based on Power Level and knowledge and awareness of the stakeholders.

**Results:** Among the subjects studied, Shahid Beheshti University of Medical Sciences (Institute of Nutritional Research and Food Industries of the country and Faculty of Nutrition) and the Office of Community Nutrition Improvement of the Ministry of Health with great power and awareness of the supportive position towards the plan Compilation of 1402 food baskets in Iranian society. In the meantime, none of the stakeholders and organizations related to them had a low level of awareness and knowledge. They didn't have an obstructing position, and they all supported the policy in question.

**Conclusion:** The qualitative study of stakeholder analysis carried out in the plan for compiling and revising the optimal food basket in 1402 shows that this program If it is associated with better results, multi-sectoral and comprehensive cooperation from all actors involved in this policy In order to provide the best possible food basket to Iranian society.

**Keywords:** "stakeholders"; "sustainable diets"; "food"; "food basket". Affordable





## INVESTIGATING THE EFFECT OF LACTOBACILLUS PLANTARUM AND CORN OIL ON THE AMOUNT OF LINOLEIC ACID IN YOGURT

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**Background and Aim:** The aim of this study was to increase CLA levels in yogurt using corn oil and *Lactobacillus plantarum* bacteria.

**Methods:** To carry out this study, the bacteria *Lactobacillus Plantarum* linoleic isomerase enzyme has the ability to synthesize CLA precursor with a source of corn oil was used to inoculate and mix them together with the starters usual yogurt with different treatments to produce high raising the amount of CLA in their physicochemical and sensory characteristics were evaluated.

**Results:** The results showed that the addition of the bacterium *Lactobacillus plantarum* is capable of producing this fatty acid, and the amount of CLA production was greatly increased when combined with our usual starters. During the addition of corn oil as a rich source of acid, CLA production increased significantly. Also, the addition of *Lactobacillus plantarum* bacteria caused favorable sensory properties in the produced yogurts.

**Conclusion:** Using the bacteria *Lactobacillus Plantarum* and optimal conditions for producing corn oil is rich in conjugated linoleic acid compared with regular yogurt containing conventional starter and the production of a functional product was prepared.

**Keywords:** yogurt; Conjugated linoleic acid; *Lactobacillus Plantarum*; corn oil



## ASSOCIATION BETWEEN FOOD CHEWING RATE AND STRESS AMONG ADULTS: RESULTS OF A CROSS-SECTIONAL STUDY IN IRAN

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**Background and Aim:** Stress is one of the most prevalent mental health problems that can severely affect everyday activities. Food chewing rate can be related to stress. So, this study aimed to explore the association between food chewing rate and stress.

**Methods:** This cross-sectional study involved 604 Iranian adults aged 18-65 from various regions. We used the DASS-21 questionnaire to measure stress and a predefined questionnaire to assess food chewing rate. We applied logistic regression analysis in unadjusted and adjusted models to examine the link between food chewing rate and stress.

**Results:** In the crude model, chewing more was associated with lower stress levels (OR: 0.341; 95% CI: 0.135-0.861; P= 0.023). The adjusted model confirmed this association after controlling for age, Body mass index (BMI), energy intake, gender, and smoking (OR: 0.296; 95% CI: 0.091-0.964; P=0.043).

**Conclusion:** The lower odds of stress was observed among the participants who chewed the most. Further prospective studies are required to confirm these findings.

**Keywords:** Stress; Eating pattern; Cross-sectional; Food chewing; Iran



## EFFECTS OF GREEN TEA SUPPLEMENTATION ON THE CRP, ESR, AND CBC IN THE PATIENTS WITH COVID-19, A DOUBLE-BLIND PLACEBO-CONTROLLED CLINICAL TRIAL

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**Background and Aim:** This research aimed to investigate the impact of green tea extract on biomarkers and symptoms in individuals who were hospitalized due to COVID-19.

**Methods:** This research constituted a double-blind clinical trial comprising 74 patients under hospital care. These individuals were randomly divided into two groups: one administered a 900mg/d dosage of green tea supplement, and the other given a placebo. This administration lasted for 14 days. Blood factors and anthropometric factors were measured before and after the intervention. In addition, dietary intake was assessed during the study.

**Results:** After the intervention, there was a significant decrease in CRP [MD 18.34 and 95%CI (8.05 to 28.62)] and ESR [MD 16.68 and 95%CI (7.41 to 25.94)] levels in the green tea group compared to the placebo group. There were also significant changes in neutrophils, lymphocytes, red blood cells (RBC), and blood oxygen saturation in the green tea group ( $p < 0.05$ ). However, there were no significant differences in other blood indices between the two groups.

**Conclusion:** The results suggest that green tea extract supplementation may have a slight positive effect on inflammation and blood markers in COVID-19 patients. Additionally, it may improve blood oxygen saturation. IRCT: IRCT20150711023153N3

**Keywords:** COVID-19, SARS-CoV-2 coronavirus; green tea, supplementation, inflammation, Complete Blood Count



## REDUCING THE INFLAMMATORY INTERLEUKINS WITH ANTI-INFLAMMATORY AND ANTIOXIDANT EFFECTS OF PROPOLIS IN PATIENTS WITH TYPE 2 DIABETES: DOUBLE-BLIND, RANDOMIZED CONTROLLED, CLINICAL TRIAL

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**Background and Aim:** This research was designed and conducted to evaluate propolis supplementation effects on insulin resistance and inflammation in patients with type 2 diabetes.

**Methods:** In the double-blind, randomized controlled study, 60 patients with type 2 diabetes were enrolled. Patients were randomly assigned to receive Iranian propolis (1500 mg/day for 8 weeks) (n = 30) and the placebo (n = 30). The primary endpoint was to detect changes in the fasting blood glucose (FBG), fasting insulin, the homeostasis model assessment insulin resistance (HOMA-IR) evaluation model, QUICKI, the homeostasis model assessment of  $\beta$ -cell function (HOMA-B), and inflammatory factors including Interleukin 6 and Interleukin 17 from baseline to the end of this study.

**Results:** Eight weeks after intervention, the mean of FBG, fasting insulin and HOMA-IR, were significantly decreased in patients treated with propolis compared with the placebo group. Furthermore, there was a considerable enhancement in the HOMA-B as a measure of  $\beta$ -cell function and QUICKI index after the administration of propolis in treated group. Serum IL-6 and IL-17 were diminished remarkably in the propolis group, while there was no significant change in the placebo group.

**Conclusion:** Based on this study, the daily intake of 1500 mg of bee propolis supplement for 8 weeks results in improvement of glycemic status, reduction in insulin resistance and inflammatory condition in patients with T2D. (Clin Diabetol) 202X

**Keywords:** propolis, diabetes mellitus, insulin resistance, interleukin 6, interleukin 17



## PROBIOTICS THAT MAY BE BENEFICIAL FOR PATIENTS WITH CIRRHOSIS

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**Background and Aim:** Probiotics are used in cirrhosis management to restore gut balance, alleviate complications, and enhance liver health by modulating inflammation and supporting the immune system. This complementary approach, alongside conventional treatments, contributes to ongoing research for a deeper understanding of probiotics' specific benefits in cirrhosis patients.

**Methods:** A thorough review of probiotic use in cirrhotic patients, using databases like PubMed and Cochrane Library, revealed key insights on probiotic strains, supplementation, and relevant treatments for cirrhosis.

**Results:** The supplementation or food enrichment with the following bacteria have been shown to be associated with positive outcomes related to cirrhosis, including AST, ALT, IL-6, TNF- $\alpha$ , TBIL, endotoxin, IL-2, IL-10: *L. bulgaricus*, *S. thermophilus*, *Lactobacillus acidophilus*, *B. bifidum*, *Lactobacillus rhamnosus GG*, *Lactobacillus subtilis*, *Streptococcus faecium*, *Bifidobacterium longum*, *E. faecalis*, *Clostridium butyricum*, *Bacillus cereus*, *Bacillus licheniformis*. Furthermore, adding prebiotics can additionally promote the effects of these probiotics. Novel techniques such as Fecal Microbiota Transplantation have shown promising results in Liver Cirrhosis. Also, phage therapies are showing promising results which may be beneficial to be implemented in therapies for humans but more research is needed to confirm its efficacy and find potential side effects.

**Conclusion:** In conclusion, the evolving research on probiotics suggests an impactful role in cirrhosis management, offering potential benefits for restoring gut balance and enhancing overall well-being in affected individuals.

**Keywords:** Cirrhosis; probiotics; symbiotic; Microbiota-Transplantation; phage-therapy



## LOW-CALORIE JELLIES CONTAINING MICRONUTRIENTS

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**Background and Aim:** Functional foods have beneficial effects on the host's health. By optimizing the production conditions, it is possible to use sugar and pectin substitutes, and appropriate microbial products with micronutrients in the formulation of jelly powder and produced gels with favorable quality properties and comparable to commercial pectins.

**Methods:** Food enrichment policies with micronutrients for the general health of the body, teeth and bones and compounds with antioxidant activity are being carried out all over the world. Among the common methods to reduce the calorie content in food products is the use of non-nutritive sweeteners such as saccharin, sucralose, aspartame and stevia, dates, honey, agave nectar and other natural syrups, which can also be used in the production of low-calorie jelly powder. These sweeteners are much stronger than sugar and are used in smaller amounts, resulting in fewer calories. In the production of jelly, pectin is an important ingredient to form the gel structure. But if there is a need to replace pectin, Several different alternatives such as gelatin, carrageenan, gums, which have high nutritional value, can be used as stabilizers and emulsifiers in the production of low-calorie gels.

**Conclusion:** Due to the increasing consumption of jelly, its enrichment with micronutrient compounds such as iron, calcium, zinc and various vitamins for children and teenagers is necessary to improve the health of society.

**Keywords:** Functional foods-low-calorie -micronutrients



## PROBIOTICS ACT AS A POTENT INTERVENTION IN IMPROVING LIPID PROFILE: AN UMBRELLA SYSTEMATIC REVIEW AND META-ANALYSIS

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**Background and Aim:** Several meta-analysis studies have revealed improving effects of probiotics on lipid profile, while some studies have reported controversial findings. The purpose of present study was to evaluate the efficacy of probiotics on blood lipids.

**Methods:** Relevant studies were searched in the international databases, including PubMed, Scopus, EMBASE, Web of Science, and Cochrane Central Library up to August 2021. The pooled results were calculated with the use of a random-effects model to assess the effects of probiotics on blood lipids. Overall, 38 meta-analyses were included in the study. The results indicated that the probiotics supplementation was effective on reduction of total cholesterol (TC) (ES= -0.46 mg/dL; 95% CI: -0.61, -0.30,  $p < 0.001$ ; I<sup>2</sup>= 83.8%,  $p < 0.001$ ), triglycerides (TG) (ES= -0.13 mg/dl; 95% CI: -0.23, -0.04,  $p = 0.006$ ; I<sup>2</sup>= 74.7%,  $p < 0.001$ ), and low-density lipoprotein cholesterol (LDL-C) levels (ES= -0.29 mg/dL; 95% CI: -0.40, -0.19,  $p < 0.001$ ; I<sup>2</sup>= 77.8%,  $p < 0.001$ ). There was no significant effect of probiotics on high-density lipoprotein cholesterol (HDL-C) levels (ES= 0.02 mg/dl; 95% CI: -0.04, 0.08,  $p = 0.519$ ; I<sup>2</sup>= 72.5%,  $p < 0.001$ ).

**Conclusion:** The results of present umbrella meta-analysis strongly support supplementation with probiotics as an influential intervention for improving lipid profile.

**Keywords:** Probiotics; Blood lipids; Dyslipidemia; Lipid profile; Umbrella meta-analysis



## EFFECTS OF PROBIOTICS SUPPLEMENTATION ON BLOOD PRESSURE: AN UMBRELLA META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Background and Aim:** Several meta-analyses have revealed that probiotics could lower blood pressure (BP), but the findings were inconsistent. In this regard, an umbrella meta-analysis was carried out to provide a more accurate estimate of the overall impacts of probiotics supplementation on BP.

**Methods:** We searched the following international databases till November 2021: PubMed, Scopus, EMBASE, Web of Science, and Google Scholar. A random-effects model was applied to evaluate the effects of probiotics on BP. Sensitivity analysis was performed by using the leave-one-out method. Grading of Recommendations Assessment, Development, and Evaluation (GRADE) was used to evaluate the certainty of evidence.

**Results:** Pooled effect size of 14 meta-analyses with 15,494 participants indicated significant decreases in both systolic (Weighted mean difference (WMD)= -1.96 mmHg; 95% confidence interval (CI): -2.78, -1.14,  $p < 0.001$ , and standardized mean difference (SMD)= -2.62 ; 95%CI: -4.96, -0.28,  $p < 0.001$ ) and diastolic blood pressure (WMD= -1.28 mmHg; 95%CI: -1.76, -0.79,  $p < 0.001$ , and SMD= -0.60 mmHg; 95%CI: -1.08, -0.12,  $p = 0.014$ ) following probiotics supplementation. Greater effects on SBP were revealed in trials with a mean age of  $>50$  years, and duration of intervention  $\leq 10$  weeks. DBP was also more reduced in studies with a dosage of  $\geq 10^{10}$  colony-forming unit (CFU) and SBP was decreased in patients with hypertension or diabetes analyzing WMD.

**Conclusion:** The present umbrella of meta-analyses suggests probiotics supplementation can improve blood pressure and claims that probiotics could be used as a complementary therapy for controlling high blood pressure.

**Keywords:** Probiotics; Blood pressure; Systematic review; Umbrella meta-analysis





## SAFFRON, AS AN ADJUNCT THERAPY, CONTRIBUTES TO RELIEVE DEPRESSION SYMPTOMS: AN UMBRELLA META-ANALYSIS

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**Background and Aim:** Saffron is a traditional herbal medicine that has been used to treat various ailments such as depressive mood. However, the findings of several meta-analyses regarding anti-depressive properties of saffron (*Crocus sativus* L.) are controversial. The current umbrella meta-analysis was carried out to determine the magnitude and direction of saffron administration on depression.

**Methods:** Relevant studies were searched in international databases including PubMed, Scopus, EMBASE, Web of Science, and Cochrane Central Library up to June 2021. Meta-analysis studies investigating the effects of saffron on depression were considered to include in the study. Random-effects model was used to perform the meta-analysis. Additional analyses including subgroup and sensitivity analyses were carried out.

**Results:** Overall, 7 meta-analyses were included in the study. The results demonstrated that the consumption of saffron resulted in a significant reduction in BDI scores (ES: -3.87; 95% CI: -5.27, -2.46). However, saffron did not change the HAMD scores (ES: -2.10; 95% CI: -5.05, 0.86,  $p = 0.164$ ) and mixed scores (HAM-D/BDI/DASS) (ES: 0.02; 95% CI: -0.39, 0.43,  $p = 0.941$ ).

**Conclusion:** Present umbrella meta-analysis demonstrated that saffron intake might contribute to alleviation of depression disorder, however, it cannot be considered as a single therapeutic approach to treat depression.

**Keywords:** Saffron; *Crocus Sativus* L; Depression; Umbrella Meta-analysis.



## THE EFFECT OF ZINC SUPPLEMENTATION ON SERUM ADIPOLECTIN CONCENTRATION AND LIPID PROFILE IN PATIENTS WITH TYPE 2 DIABETES; A SYSTEMATIC REVIEW

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**Background and Aim:** Zinc has a special role in diabetic patients due to its involvement in the production, storage and secretion of insulin. Adiponectin is a peptide hormone that is secreted from adipose tissue in humans and is effective on fat and glucose metabolism. This study was conducted with the aim of investigating the effect of zinc supplementation on serum adiponectin concentration and lipid profile in patients with type 2 diabetes.

**Methods:** This study was conducted in 2023 with an advanced search in reliable databases. The reviewed articles are from 2013 to July 2023. Among the 78 articles reviewed in three stages by reading the title, abstract and then reading the full text according to the Prism guidelines according to the entry and exit criteria (studies conducted on humans and animals, the language of the articles in English, without restrictions on access to the full text and the type of study) 10 studies were included in the research.

**Results:** Zinc plays a role in the metabolism of lipids. Zinc supplementation in people with type 2 diabetes significantly reduces the level of total blood cholesterol, LDL cholesterol and triglycerides, and also increases the level of HDL-C cholesterol. Zinc also increases Release of adiponectin from human adipocytes.

**Conclusion:** Zinc supplementation restored the concentration of adiponectin in patients with type 2 diabetes and significant changes were made in all 4 lipid profile components. However, more studies are needed to determine the definitive effectiveness.

**Keywords:** Adiponectin, Zinc, Type II Diabetes Mellitus, Lipid profile



## THE EFFECT OF NUTRITION ON MENTAL HEALTH: A SYSTEMATIC REVIEW

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**Background and Aim:** Mental health disorders are one of the common complications of this century and it is predicted that they will be the main cause of disease burden globally by 2030. Scientific evidence shows that diet and nutrition are not only vital for the physiology and composition of the human body, but also have significant effects on mood and mental health. The purpose of this study is to provide an overview of the emerging field of nutritional psychiatry and to examine the role of nutrition on various aspects of mental health

**Methods:** This study was conducted by searching Pubmed database and Google Scholar search engine from 2012 to 2023 using the keywords Nutritional psychiatry, Nutrition, Mental health

**Results:** 80 articles were identified from two databases and 30 duplicate records were excluded, and then 22 records were excluded based on the assessing the title, abstract and full text. The remaining 28 articles were assessed for eligibility and finally 10 articles were included in this systematic review. The results show that the composition, structure and function of the brain depends on the availability of appropriate nutrients. In addition, endogenous gut hormones, neuropeptides, neurotransmitters, and gut microbiota are directly affected by dietary composition.

**Conclusion:** Overall, emerging studies in the field of nutritional psychiatry have established that learning and memory abilities, as well as mood, can be influenced by diet. However, the mechanisms by which diet modulates mental health are still not fully understood, and an important step in the future is to discover these mechanisms.

**Keywords:** Nutritional psychiatry, nutrition, mental health



## ROLE OF FASTING DIET IN POLYCYSTIC OVARY SYNDROME

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**Background and Aim:** Polycystic ovary syndrome is the most common syndrome during a woman's fertility period. 19.5% of Iranian women suffer from polycystic ovary syndrome. Complications of this syndrome include menstrual disorders, infertility, ovarian cysts, oligomenorrhea, hyperandrogenism, dyslipidemia, metabolic syndrome, and obesity. Obesity is associated with some diseases, including coronary arteries, high blood pressure, heart disease, dyslipidemia, and type 1 and 2 diabetes. A fasting diet is one of the new and effective ways to lose weight, which has different types. In the intermittent fasting diet, there is a free day on which food is consumed freely, in another type of fasting diet, there is a limited time during food consumption.

**Methods:** In this review study, we searched Pub Med, Elsevier, and Google Scholar databases, and keywords such as polycystic ovary, fasting diet, and obesity, diet were used. Several diets have been suggested for treating PCOS, such as a low glycemic diet, Mediterranean diet, low carbohydrate diet, ketogenic diet, low starch and low dairy diet, vegetarian diet, and fasting diet.

**Results:** However, an intermittent fasting diet can help improve the symptoms of polycystic ovary syndrome. A fasting diet with a time limit can be effective in reducing body weight and improving insulin resistance in patients with polycystic ovary disease.

**Conclusion:** Finally, the fasting diet can be considered an effective way to improve polycystic ovary syndrome

**Keywords:** fasting, diet, polycystic ovary syndrome



## THE IMPACT OF DIETARY CAFFEINE WITH LIPID PROFILE

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**Background and Aim:** Considering the lack of consistent findings concerning the relationship between coffee intake and lipid profile levels, further investigations into the association between caffeine and lipid profile are warranted.

**Methods:** Our study included a total of 7,334 subjects (3,565 men and 3,769 women) aged 20-59 years. Odds ratios and 95% confidence intervals were calculated for lipid levels (total cholesterol (TC)  $\geq$  200 mg/dl, triglycerides (TG)  $\geq$ 150 mg/dl, low density lipoprotein cholesterol (LDL-C)  $>$ 115 mg/dl, high density lipoprotein cholesterol (HDL-C)  $<$ 40 mg/dl, TC/HDL-C  $>$ 5, LDL-C/HDL-C  $>$ 3.3, non-HDL-C  $>$ 130 mg/dl.

**Results:** Based on the fully adjusted model (including age, sex, race, BMI, occupation, sleep duration, sugar intake, alcohol consumption, smoking, diabetes, arterial hypertension, physical activity, energy intake, protein intake, fat intake, carbohydrate intake, fiber intake, triglycerides, and total cholesterol), subjects who consumed higher coffee intake have high TG levels (OR: 1.14, CI: 1.05 to 1.24,  $p=0.001$ ), TC (OR: 1.14, CI: 1.09 to 1.19,  $p<0.001$ ), LDL-C (OR: 1.08, CI: 1.0001 to 1.16,  $p<0.001$ ). However, this impact was no significant for HDL-C (OR: 1.07, CI: 0.99 to 1.15,  $p=0.063$ ).

**Conclusion:** Our findings suggest that dietary caffeine intake significantly increase TC, TG and LDL in the American population. Further research is warranted to explore this relationship in patients with different inflammatory diseases.

**Keywords:** caffeine; coffee; lipid profile; inflammation.



## FOOD INSECURITY IN CANCER PATIENTS: A SYSTEMATIC REVIEW

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**Background and Aim:** Cancer is a disease that involves abnormal cell growth and spread. Cancer patients may face challenges with their diet, making them more vulnerable to food insecurity. Food insecurity (FI) refers to insufficient access to culturally and nutritionally appropriate food. FI is a significant public health issue that affects many cancer survivors in the United States. FI can negatively impact their health and make it harder for them to receive medical care. This study aimed to summarize the available evidence regarding food insecurity in patients with cancer.

**Methods:** Pertinent studies up to March 2023 were identified using Scopus, ISI Web of Science, and PubMed. Three researchers assessed the titles, abstracts, and full texts to include eligible articles.

**Results:** This study included twenty eligible studies; based on the search results, the prevalence of food insecurity among cancer patients and survivors ranges from 4.0% to 26.2%. Women were more likely than men to report being food insecure. Food insecurity may negatively impact cancer treatment results through various pathways, as it has been linked to the reduced consumption of nutrient-rich foods and lower intake of essential micronutrients. Food-insecure patients have significantly higher levels of nutritional risk, depression, and lower quality of life than food-secure patients.

**Conclusion:** Food insecurity is a significant concern among cancer patients and affects them disproportionately regardless of sex, ethnicity, or race. Further investigation is required to gain a better understanding of the reasons for and consequences of food insecurity among individuals with cancer.

**Keywords:** Food insecurity ; cancer ; screening ; malnutrition



## MALNUTRITION AND COGNITIVE STATUS IN ELDERLY REFERRED TO OUTPATIENT CLINICS OF MILAD HOSPITAL IN TEHRAN

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**Background and Aim:** Food insecurity can cause adverse effects on the physical and mental health of the elderly. This study aimed to investigate the association among food insecurity, malnutrition, and cognitive impairment in elderly.

**Methods:** In this cross-sectional study, 165 elderly people referred to Milad Hospital clinics were selected using random sampling method. A general questionnaire was used to collect demographic data, as well as Household Food Insecurity Access Scale (HFIAS) to assess food insecurity, Mini Nutritional Assessment (MNA) questionnaire to assess nutritional status and Short Mental Status Test (MMSE) questionnaire to evaluate cognitive status. For data analysis, logistic regression test was used in SPSS software.

**Results:** There was a significant association between food insecurity and malnutrition (odds ratio [OR] = 5.36; 95% confidence interval [CI], 2.18-13.17;  $P < .001$ ). The odds of cognitive impairment in the elderly with food insecurity were also more than 4 times higher than those with food security (OR = 4.35; CI, 1.78-10.59;  $P = .01$ ).

**Conclusion:** Because of the association between food insecurity, malnutrition, and cognitive impairment, food security in the elderly should be considered.

**Keywords:** cognitive impairment, elderly, food insecurity, malnutrition



## ASSOCIATIONS OF ABDOMINAL OBESITY WITH DIFFERENT TYPES OF BONE FRACTURES IN ADULTS: A SYSTEMATIC REVIEW AND DOSE-RESPONSE META-ANALYSIS OF PROSPECTIVE COHORT STUDIES

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**Background and Aim:** Findings on the association between abdominal obesity and hip fracture were summarized in a meta-analysis in 2017; however, no study has examined the dose-response association between abdominal fat indices and hip fracture. Also, we found no meta-analysis investigating other types of bone fractures including any vertebral fractures in relation to abdominal obesity. Therefore, the present systematic review and dose-response meta-analysis of prospective cohort studies were conducted to examine the association between abdominal obesity and different types of bone fractures.

**Methods:** A comprehensive literature search was done by searching PubMed, Scopus, Web of Science, and Google Scholar until October 2021.

**Results:** In total, 23 articles from prospective cohort studies with a total sample size of 3,456,631 participants were included. During the follow-up periods ranging between 4 and 26 years, 137,989 cases of bone fracture were recorded. After comparing the highest and lowest categories of abdominal fat indices, the summary relative risks (RRs) of any, hip, and vertebral fractures were 0.99 (95% CI: 0.81–1.20), 1.09 (95% CI: 0.82–1.43), and 1.18 (95% CI: 1.05–1.33), respectively, indicating a significant positive association between abdominal obesity and risk of vertebral fracture. In the non-linear dose-response analysis, abdominal obesity based on the waist-to-hip ratio (WHR) was positively associated with an increased risk of hip fracture from 0.7 to 1.1 units of WHR. In the linear analysis, a 10 cm increase in waist circumference (WC) was associated with a 3% higher risk of vertebral fracture.

**Conclusion:** In conclusion, abdominal obesity may be associated with a higher risk of hip and vertebral fractures.

**Keywords:** Abdominal obesity; osteoporosis; hip fracture; waist circumference; meta-analysis





## THE IMPACT OF SUMAC (*RHUS CORIARIA L.*) FLAVONOIDS COMPOSITION ON POTENTIAL IRON DEFICIENCY RESULTING FROM SPORTS-RELATED INFLAMMATION

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**Background and Aim:** The purpose of this study was to investigate the effect of the simultaneous consumption of sumac powder (*Rhus Coriaria L.*) and ferrous sulfate for six weeks on hematologic indices such as ferritin, hemoglobin (Hb), hematocrit (HCT), and mean corpuscular volume (MCV), and inflammation (high sensitivity C-reactive protein), in teenage volleyball players with depleted iron stores (serum ferritin less than 40 ng/ml)

**Methods:** In a semi-experimental study, 30 girls aged 15-18 years with three to five years of background in volleyball who were at the special level of preparation with low iron stores were screened and randomly divided into three homogeneous groups (iron supplementation, iron supplementation+ sumac powder, and placebo). Capsules containing ferrous sulfate with 50 mg of elemental iron, one gram of sumac powder, and one gram of rice flour (placebo) were consumed daily by the subjects until the end of the study.

**Results:** Compared to the other two groups, only the iron group showed a significant increase in ferritin concentration ( $P=0.000$ ). None of the three groups showed any significant changes in Hb, Hct and Mcv ( $P=0.57$ ,  $P=0.36$ ,  $P=0.33$ ), and hs-C reactive protein ( $P=0.06$ ).

**Conclusion:** The results indicated that sumac powder not only failed to improve the blood markers through reducing inflammation, but also had a negative impact on them.

**Keywords:** Ferritin, flavonoids, hs-CRP, sumac powder, volleyball



## PROBIOTICS AS AN EFFECTIVE THERAPEUTIC APPROACH IN ALLEVIATING DEPRESSION SYMPTOMS: AN UMBRELLA META-ANALYSIS

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**Background and Aim:** Growing evidence has suggested that the consumption of probiotics can decrease depressive symptoms. However, even the results of meta-analyses are conflicting. In this regard, we performed an umbrella meta-analysis and proposed the decisive impacts of probiotics on depressive symptoms.

**Methods:** The following international databases were searched up to July 2021: PubMed/Medline, Web of Science, Scopus, EMBASE, and Google Scholar. Meta-analyses investigating the impact of supplementation of probiotics on depression symptoms in adults were included. According to the studies, random-effects model was used to perform the analysis. Subgroup analysis was performed by dosage of probiotics, duration of supplementation and total sample size. Publication bias was assessed using Egger's, Begg's and visual inspection of funnel plot. Ten meta-analyses (n= 8886 participants) were included in study. The pooled data indicated that probiotic supplementation significantly reduced depression symptoms (ES= -1.41; 95% CI: -2.53, -0.30, p= 0.016; I<sup>2</sup> = 99.4, p= <0.001). Subgroup analysis of studies with intervention duration >8 weeks and dosage >10 × 10<sup>9</sup> CFU demonstrated a more robust effect of probiotics on decreasing depression symptoms. There was also significant between-study heterogeneity in which dosage was identified as source of it.

**Conclusion:** The results of present umbrella meta-analysis suggest administration of probiotics for relieving depression symptoms for >8 weeks with dosage of >10 × 10<sup>9</sup> CFU.

**Keywords:** Probiotics, Depression, Major depressive disorder, Umbrella meta-analysis.



## Associations of abdominal obesity with different types of bone fractures in adults: A systematic review and dose-response meta-analysis of prospective cohort studies

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Findings on the association between abdominal obesity and hip fracture were summarized in a meta-analysis in 2017; however, no study has examined the dose-response association between abdominal fat indices and hip fracture. Therefore, the present systematic review and dose-response meta-analysis of prospective cohort studies were conducted to examine the association between abdominal obesity and different types of bone fractures. A comprehensive literature search was done by searching PubMed, Scopus, Web of Science, and Google Scholar until October 2021. In total, 23 articles from prospective cohort studies with a total sample size of 3,456,631 participants were included. During the follow-up periods ranging between 4 and 26 years, 137,989 cases of bone fracture were recorded. After comparing the highest and lowest categories of abdominal fat indices, the summary relative risks (RRs) of any, hip, and vertebral fractures were 0.99 (95% CI: 0.81–1.20), 1.09 (95% CI: 0.82–1.43), and 1.18 (95% CI : 1.05–1.33), respectively, indicating a significant positive association between abdominal obesity and risk of vertebral fracture. In the non-linear dose-response analysis, abdominal obesity based on the waist-to-hip ratio (WHR) was positively associated with an increased risk of hip fracture from 0.7 to 1.1 units of WHR. In the linear analysis, a 10 cm increase in waist circumference (WC) was associated with a 3% higher risk of vertebral fracture. We found no other dose-response association for other types of bone fractures. In conclusion, abdominal obesity may be associated with a higher risk of hip and vertebral fractures.