شرکت در این کنگره رایگان است

# چهارمین کنگره سالانه

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# چکیده مقالات پوستر های چهارمین کنگره سالانه همگرایی در علوم غدد درون ریز

## *Gene Therapy, CRISPR, a new way to treat obesity*

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Abstract

Purpose

The potential of gene therapy especially CRISPR/Cas9 to address human diseases has been known. The efficacy and safety of obesity management options are under question showing the need for more effective approaches. This study aims to explore the potential of gene therapy specifically CRISPR/Cas9 in obesity treatment.

Methods

A comprehensive literature review was undertaken by searching keywords such as "gene therapy", "genome editing" and CRISPR/cas9 in databases including PubMed, Scopus, Web of Sciences, and Google Scholar. Additionally, information about gene therapy in obesity was obtained by adding the word "obesity". Artificial intelligence tools were implemented to summarize and extract key points from the reviewed articles.

Results

Gene therapy in obesity intends to restore and preserve energy homeostasis by transferring and expressing therapeutic genes in appropriate cells. Target genes consist of those related to circadian rhythm, thermogenesis, lipid lysis, adipocyte differentiation, food intake, fatty acid metabolism, and expansion of visceral adipose tissue. The use of adeno-associated viral vectors to transfer BMP7 gene has revealed evidence in treating insulin resistance, type 2 diabetes, and obesity. CRISPRi system targeting Fabp4 has demonstrated reduced adipocyte expression, leading to weight loss, improved insulin resistance, and hepatic steatosis in obese mice. Also, it has been shown that CRISPRa activated an existing copy of SIM1 gene and returned obesity or protected mice heterozygous for MC4R from obesity.

Conclusion

CRISPR/Cas9 is a powerful genome editing tool due to its high efficiency, cost-effectiveness, and ease of use. However, ethical considerations should be taken into account, including potential misuse, unintended consequences, and implications for future generations. In general, the potential of using gene therapy, especially the CRISPR system, as the basis of modern obesity treatments is promising while additional research confirming the responsible and beneficial use of this technology is a necessity.

## *Treatments of Obesity Based on the Persian Medicine Resources and its Comparison with Conventional Medicine*

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Purpose : This study aims to extract the recommended treatments for Obesity in Persian medicine (PM) sources for lifestyle modification, employing therapeutic methods, and comparing them with conventional medicine (CM).

Methods: In this narrative review treatment of obesity, were extracted from 15 PM sources then, compared with CM recommendations.

Results: According to PM books, obesity is divided into two categories, and three main causes are mentioned, including increased phlegm, coldness of the body's temperament, and dominance of moisture. Numerous complications, including increased risk of chronic infections, infertility, stroke, and cardiovascular disease, have also been mentioned. The principles of obesity treatment include adherence to lifestyle measures and body cleansing from waste materials using oral (23

formulations) and topical (various warm oils and ointments) treatments. In addition, specific instructions for local obesity treatment have been proposed, including bandaging, warming the organ, using a suction cup (dry cupping) on the opposite side to reduce blood supply to the organ of interest, and using topical medications that dissolve excess materials within the organ (about 10 topical formulations). The most of the recommended medications in PM have appetite suppressant, metabolism-enhancing, blood sugar-lowering, anti-obesity, and blood fat-lowering properties.

Conclusion: The information obtained from this study can be an idea for future studies and, if proven effective, can be used as complementary treatments for obesity.

Keywords: Obesity, Persian Medicine, lifestyle modification, treatment

## *Effects of a traditional herbal formulation on cardiometabolic risk factors in overweight and obese women*

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Background and Aim : The escalating global obesity crisis, impacting over 1.9 billion adults, has fueled the quest for innovative weight management solutions. This investigation explores the potential of Zireh capsule (ZC), a Persian Medicine compound comprising fennel, ajwain, black caraway, and anise. The primary objective is to assess ZC's impact on metabolic parameters and anthropometric indices, particularly targeting overweight and obese women.

Methods: This randomized controlled trial involved 70 women with a BMI of 25-34.9 kg/m2. Divided into two groups, they received either a low-calorie diet with 2 g/day of ZC or a placebo for eight weeks. Anthropometric, dietary, and biochemical parameters were measured, and adherence to the diet was assessed by comparing recommended and consumed calories and macronutrients.

Results: Sixty patients (intervention=30; placebo=30) completed the trial. After the intervention, the ZC group, had a significant reduction of weight (-4.8kg vs. -3.2 kg, P-Value=0.0001), BMI (-1.8 kg/m2 vs. -0.79 kg/m2, P-Value=0.0001), hip circumference (HC) (-0.018 vs. -0.008, P-Value=0.047), waist circumference (WC) (-5.28 vs. -3.20, P-Value=0.004) and low-density lipoprotein (LDL) (-11.7 vs. 6.7, P-Value=0.0001) compared with placebo group. None of the patients in both groups reported any side effects. There was no significant difference between the recommended and consumed intake in both groups.

Conclusion: Combining ZC with calorie restriction shows promise in alleviating cardiometabolic risks in overweight and obese women, but further research is essential to establish its efficacy as a complementary obesity intervention.

Keywords: overweight, obesity, Persian Medicine, cardiovascular diseases

## *Exploring Causes of Underweight: Lifestyle Measures and Recommended Treatments in Iranian Traditional Medicine*

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Purpose: The purpose of this study is to explain underweight and severe underweight from the perspective of Persian medicine, its types, causes, and treatment methods.

Method: In the present review study, 15 PM sources such as *Al-Hawi fi Al-Tib* and *Qanun fi Al-Tib*, were examined, and information related to underweight was extracted.

Findings: According to Persian medicine sources, underweight is divided into two categories based on body composition: due to cold and dryness or due to heat and dryness. The diagnostic methods for each type and the nine causes have been discussed in detail (after precise examination), and after the diagnosis, specific lifestyle measures (special foods, massage and exercise, and bath) and in the next stage, oral and topical drug treatments (more than 160 formulations with one or more medicinal herbs) have been recommended. If a subject is only suffering from underweight in one part of the body, specific solutions have been presented in PM sources to restore that part to its natural size.

Conclusion: These recommendations can be presented as complementary treatments to patients alongside the recommendations provided in conventional medicine. However, it is necessary to first investigate the effectiveness of PM recommendations regarding underweight by conducting studies.

Keywords: Underweight, Nutrition, Complementary treatment, Persian Medicine

## *Behavioral outcomes of online diabetes information-seeking behavior among patients with type 2 diabetes: the role of e-health literacy and patient-physician communication*

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*Abstract*
Purpose: The internet has revolutionized how people, especially those with chronic illnesses like diabetes, access health information. While research suggests online information seeking can positively influence health behavior, its impact may vary depending on additional factors. We aimed to examine the moderating role of e-health literacy (eHL) and patient-physician communication in the relationship between the online diabetes information-seeking behavior (Online DISB) and behavioral consequences.
Methods: A total of 760 individuals with type 2 diabetes completed a cross-sectional survey assessing sociodemographic characteristics, diabetes status, Online DISB, eHL, aspects of patient-physician communication (Hurried Communication, Elicited Concerns/responded, Explained Results/medications), and patient behavioral outcomes (self-care and medication adherence). The data were analyzed using multiple regressions using maximum likelihood in M-plus.
Results: Online diabetes information-seeking behavior significantly predicted diabetes self-care and medication adherence behaviors. Lower Hurried Communication, higher Elicited Concerns, higher Explained Results, and higher eHL were significantly associated with better self-care and medication adherence. Explained Results/medications, and eHL moderated the relation between Online DISB and both self-care activities, and medication adherence.

Conclusions: Our findings demonstrate that e-health literacy and effective patient-physician communication strengthen the positive association between online diabetes information seeking and self-care practices. This underscores the importance of promoting both e-health literacy and strong communication to improve self-care practices and medication adherence among individuals with diabetes who use online resources.

Keywords: Type 2 diabetes mellitus; Online health information-seeking behavior, e-Health literacy, Patient-physician communication

## *A review of the applications of novel medical technologies in disease diagnosis based on Complementary Medicine diagnostic pattern*

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Abstract

Purpose: Traditional Persian Medicine (TPM) is one of the complementary therapies which analyzes personalized indicators in clinical reasoning for disease diagnosis and examines finer criteria a more precise evaluation. It appears essential to utilize more standard computational methods and instruments in Traditional Medicine diagnostic process.

Methods: This study explores innovative biomedical devices utilized for diagnosis of diseases in traditional and complementary medicine through searches in scientific databases such as Pubmed, Google Scholar, SID and ScienceDirect using relevant keywords.

Results: In the contexts of complementary medicine including TPM, there is a notable emphasis on the detailed description of the patients' state and evaluation of semiology as the most important factors in disease diagnosis. Assessing features such as tongue appearance, skin color, urine, stool and pulse has guided physicians in diagnosis based on changes observed in these cues. The findings of this study suggest that there is a potential for interaction between traditional and modern medicine to improve disease diagnosis considering changes recorded in imaging devices and emerging medical technologies. By utilizing imaging devices used for face, eye and mouth, along with sophisticated software, the detection of diseases such as diabetes, fatty liver, dyslipidemia, as well as kidney and liver disorders has been facilitated through the analysis of registered changes. Additionally, non- invasive tools have been developed for measuring blood pressure based on assessing pulse characteristics in examing internal issues. Telemedicine systems also use temperature and pulse features emphasized in Persian Medicine patterns. Biosensors are inexpensive and available diagnostic tools that transmit different electronic signals based on sensitivity to the concentration of the type of herbal drug used individually.

Conclusion: Taking into account society's interest, it seems that more research is required within the field of intelligent health care design through collaboration between TPM and modern medicine.

Keywords: Technological diagnosis, Smart healthcare, Biomedical engineering, Complementary Medicine, Persian Medicine

## *Review article: Personalized medicine in diabetes with the approach of Persian medicine*

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Purpose: The clinical decision-making process has been greatly influenced by diabetes, which is considered one of the oldest diseases in human history. This is primarily due to the high costs of care and the varying responses of patients to standard treatments. The lack of focus on personalized medicine in the therapeutic field has contributed significantly to these challenges. In this paper, we investigate the personalized medicine issues within Persian medicine (PM) and explore how it addresses patient and disease reasoning.

Methods: In the present review study, Avicenna, Razi, Ahvazi and Zahrawi's books were utilized to examine personalized indicators of diabetes in different conditions.

Results: The terms “personalized medicine” and “precision medicine” have been utilized for individualized- based medicine in recent articles correlating to diabetes. This concept is expressed as “*Estedlalat*” meaning clinical reasoning in the PM resources. Ten personalized indicators have been identified in clinical reasoning based on precision medicine analysis including: type and cause of the disease, strength of the disease, patient's natural temperament(genetic), deviation from the natural temperament (epigenetics), age and habits, seasons of the disease, city of residence and patient condition at the illness time. Then, more accurate symptoms like pulse, urine, feces, etc. are scrutinized.

Conclusion: Personalized medicine with the approach of PM has always been closely linked to clinical reasoning. Recent findings emphasize the increasing importance of implementing personalized medicine and precision medicine in the treatment of diabetes.

Keywords: Persian Medicine, Diabetes, Personalized medicine, Precision medicine, clinical reasoning

## *The association between anthropometrics indicators and TSH, T4, T3 and T3up in a population of Iranian with breast cancer and treatment with tamoxifen*

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Introduction:

Relatively recently, obesity has become a worldwide concern at an increasing rate and has been recognised as a risk factor for cancer development. Obesity is defined as the accumulation of extra fat in the body, and since there is currently no direct technique to measure total body fat, the BMI index is used as the reference for defining obesity; however, studies have shown that measuring the waist size could be a more accurate approach. On the one hand, reports have shown different results in terms of the effect of this drug on thyroid function, and on the other hand, hypothyroidism can cause obesity. In this study, we aimed to determine the effect of tamoxifen on obesity in people with hypothyroidism.

Methods:

We selected people who have completed chemo and radiotherapy and could be candidates for using tamoxifen as well. First, their height, weight, and the size of their waist and hips were measured, and a blood sample was taken to determine and check TSH, T3, T4, and T3UP, and repeated 3 and 6 months after the treatment commencement. Cox regression software was used to determine the Hazer ratio and interval confidence to investigate any possible relationship between anthropometric features and the risk of developing cancer. The T-test was utilized to analyses the data.

Results:

It was observed that tamoxifen affects T3, T4, TSH, and T3UP blood concentration. A significant decrease in the values of T3 uptake (P=0.002), T3 (P=0.01), T4 (P=0.02) and a significant increase in TSH (P=0.008) were observed. The results show that the decrease in T3 up-take, which indicates the increase in the binding capacity of serum TBG, has led to a decrease in T3 and T4, followed by an increase in serum TSH.

Conclusion:

To conclude, there is a direct relationship between obesity and tamoxifen intake in terms of thyroid disorders.

Key words: TSH, T4, T3, T3up, cancer, Tamoxifen, Anthropometric

## *Improvement of bioavailability of herbal medicines by nano-structures in management of diabetes: a systematic review of in vivo studies*

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Abstract

purpose: Combination of nanotechnology with herbal treatments will improve bioavailability, decrease the required dose, and decline adverse events leading to enhancement of the pharmacological efficacy of herbal extracts. As diabetes is a worldwide concern, we aimed to summarize the available evidence of nanostructure-based herbal treatments in the management of diabetes in animal studies.

Methods: In this systematic review we searched PubMed and Web of Science using relevant keywords and synonyms for 'herb' AND 'animal study' AND 'nanostructure' AND 'diabetes' up to September 2023. After excluding irrelevant studies, (P) animal studies using (I) herbal treatments with nanostructures and (C) any comparisons on (O) diabetes parameters were included according to PRISMA guidelines. Animal type, plant name and extraction method, dose

and duration of intervention, type of nanoparticle, outcomes, and side effects were extracted from studies.

Results: From 264 retrieved studies, 13 animal studies were enrolled for further evaluation. Most of the studies used rats rather than mice, 5-10 weeks old, and mostly males. Syzygium cumini L. was repeated in 2 studies, nanoparticles ranged from 10 to 236 nm and mostly chitosan. Significant improvement in diabetes parameters (fasting blood glucose, serum insulin, and glycosylated hemoglobin), lipid profiles (cholesterol and triglycerides), and liver, inflammation, and oxidative stress markers with no adverse event were reported.

Conclusion: This systematic review shed a light through the way of managing diabetes and its complications such as diabetic foot, dyslipidemia, oxidative stress, and inflammatory condition with herbal medicines combined with nanotechnology.

Keywords: diabetes; phytotherapy; nanotechnology; medicinal plants

## *Effects of a Cumin based Traditional Persian Medicine formula in the management of obesity: a randomized placebo-controlled double-blinded clinical trial*

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Abstract:

Purpose: Obesity is one of the most common chronic diseases associated with serious mortality in metabolic diseases. Although central obesity is closely related to insulin resistance, dyslipidemia, and systemic inflammation, patients' adherence to the available treatments is loose. Hence, according to the increasing tendency of patients to use traditional medicines, we aimed to evaluate the effectiveness an herbal formula based on Persian Medicine to alleviate obesity.

Methods: After obtaining legal permissions from Tehran University of Medical Sciences (Ethics code: IR.TUMS.MEDICINE.REC.1400.1380) and registering the protocol of study (IRCT20171007036614N2), participants signed an informed consent. Firstly, Patients were divided into 2 strata: overweight and obese. Then in each stratum, patients were randomized into 2 groups using block randomization receiving either medicine or placebo capsules. Herbal capsule was made of Cuminum cyminum L., Apium graveolens L., Ruta graveolens L., Trachyspermum ammi L., Origanum majorana L., and sodium tetraborate and placebo capsuled were filled by pectin. Participants were requested to take two 500 mg capsules 3 times a day for 2 months. Anthropometric indices were compared before, after 1 month and 2 months after the intervention using SPSS repeated measurements.

Results: Total 108 patients were included in this study, mean age 42.38 years old (P=0.398) and 67% females (P=0.864). In both intervention groups, herbal capsules significantly reduced arm, wrist, waist, and leg circumferences (P<0.05) with no change in weight (P>0.05).

Conclusion: The Cumin-based Traditional Persian Medicine formula can be helpful as an adjuvant medicine for improvement of anthropometric indices. Further studies with higher sample size are required.

Keywords: obesity; Persian Medicine; medicinal plants; phytotherapy

## *A systematic investigation of the role of bio-synthetized nanoparticles to enhance anti-diabetic herbal treatments*

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Abstract

Purpose: As nanotechnology has improved, different treatments based on nanoparticles (NP) have been established to enhance the efficacy, bioavailability, and safety of the treatments. Regarding the global concern of diabetes and its complications, we aimed to investigate animal studies on diabetes used bio-synthetized NPs by medicinal herbs.

Methods: We performed a systematic search in PubMed and Web of Science with relevant keywords and synonyms for 'herbal treatment', 'in vivo studies', 'nanoparticles', and 'diabetes' up to December 2023. Based on the PRISMA guideline, we included diabetic animal studies that used bio-synthetized nanoparticles to ameliorate complications of diabetes. After excluding irrelevant studies, plant scientific name and the method of extraction, dose and duration of intervention, type of nanoparticle, and significant results were extracted from full-texts.

Results: From a total of 264 studies, 43 animal studies were included for further investigations. Different herbal extracts have been used among included studies such as pomegranate, sore tea, fenugreek, etc. golds, silver, copper, zinc, and selenium were reduced by herbal agents to synthesize nanoparticles. This study showed that combining nanoparticles with herbal extracts can significantly improve different features of diabetes such as fasting blood glucose, serum insulin, and glycosylated hemoglobin, total cholesterol, HDL, LDL, triglycerides, and oxidative stress and inflammatory markers such as catalase or glutathione.

Conclusion: This study showed that combining nanotechnology with herbal treatments can enhance the effectiveness of herbal treatments in improvement of diabetes hyperglycemia and other complications of diabetes such as dyslipidemia and oxidative stress.

Keywords: diabetes; phytotherapy; nanotechnology; medicinal plants

## *Investigating the genotypes frequency of rs1931013246 and rs747089665 CYP2D6 gene in the Iranian Population*

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Abstract

Purpose: The *CYP2D6* enzyme, which belongs to the cytochrome P450 (CYP) metabolizing enzyme family, is important for breaking down 20-25% of the drugs that are prescribed. The *CYP2D6* gene has genetic variants, leading to variable enzyme activity among individuals. This study focuses on elucidating the prevalence of specific *CYP2D6* genetic polymorphisms, such as rs1931013246 (*CYP2D6*55*) and rs747089665 (*CYP2D6*135*), within the Iranian population.

Materials and Methods: The criterion for entering the people into the study was specific and precise ethnicity, assuming the absence of disease and the use of specific drugs, which were asked according to the prepared questionnaires. Blood samples were extracted from 389 individuals from different Iranian ethnic groups such as: Persian, Turk, Lore, Kurd, Gilaki and Mazani, Baloch, Turkaman and Arab. The Sanger sequencing method was used for genotyping.

Results: No risk alleles were found for the studied polymorphisms, indicating the absence of *CYP2D6*55* and *CYP2D6*135* in the Iranian population. The normal phenotype (NM) was predicted. The absence of these alleles has potential implications for drug response in this population, emphasizing the importance of considering population-specific genetic variants in clinical decision-making.

Conclusion: In the present study, *CYP2D6*1/*1* genotype was observed and no mutated allele was determined. Understanding the genetic makeup of the Iranian population in this context can help develop more personalized medicine and effective drug treatments and ultimately help improve patient outcomes and the overall quality of healthcare.

Keywords: *CYP2D6* gene, Pharmacogenetics, Personalize Medicine, *CYP2D6* Polymorphism.

## *Investigating the genotypes frequency of rs267608319, and rs569439709 polymorphisms in the CYP2D6 gene in the Iranian Population*

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Abstract

Purpose: Cytochrome P450 (CYP2D6) plays an important role in the metabolism of approximately 20–25% of widely prescribed drugs. The CYP2D6 gene is highly polymorphic, and the combination of its alleles is related to enzyme activity in different populations. To understand the frequency of the genetic polymorphisms of CYP2D6 gene within individuals in populations, in this study we investigated the genotypes frequency of rs267608319 and rs569439709 polymorphisms in the CYP2D6 gene among the Iranian population.

Methods:Blood samples were extracted from 389 individuals in Iranian ethnic groups(including Fars, Azeris, Gilakis and Mazandaranis, Kurds, Arabs, Lurs, Balochs, Turkmen, and others) regardless of their drug consumption, and PCR was used to amplify the part where the desired variants were located, then sequencing was done by Sanger sequencing method and finally statistical analysis was done using SPSS version 20 software.

Results: The homozygous CYP2D6*1/*1(CC) genotype was predominant for all polymorphisms associated with the CYP2D6 gene, indicating that CYP2D6*31 and *113 risk alleles are not observed in the population. Additionally, it is predicted that the normal metabolizer (NM) phenotype is high in the Iranian population.

Conclusion: The absence of CYP2D6*31 and 113* alleles in different ethnic groups do not have a significant effect on CYP2D6 enzyme activity in Iranian population . The findings emphasize the importance of variation in the frequency of alleles among the populations and the necessity of conducting comprehensive studies on larger populations to determine CYP2D6 allelic composition and improve therapeutic outcomes of CYP2D6-metabolized drugs.

Keywords: Pharmacogenomics, CYP2D6 gene, Polymorphism, rs267608319, rs569439709

## *Endocrine-disrupting food contaminants an important global health concern*

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ABSTRACT

Endocrine-disrupting compounds (EDCs) are exogenous substances that disrupt the normal functioning of hormones and can cause health issues. Food contact materials are a significant source of chemical contaminants in food and can expose humans to EDCs. These compounds also can be found in various food products like canned food, dairy products, bottled water, eggs, fish, meat, and vegetables, posing a widespread concern to the general population. The contamination of food by environmental pollutants such as dioxins, metals, parabens, biphenyl, pesticides, and phthalates is a topic of great interest. The accumulation of EDCs in the body can result in sterility, sexual underdevelopment, and abnormal sexual behavior, disruption of thyroid or adrenal function, increased risk of certain cancers, birth defects, weakened immune system, heightened immune response, and autoimmune diseases. In recent years, there has been growing concern about environmental contamination and human exposure to these chemicals, as their levels exceed the permissible limits. Therefore, it is crucial to understand the properties of EDCs, including their origin, exposure ways, and toxicological effects, in order to effectively handle their release into the environment and food chain.

*Keywords:* Endocrine, Food safety, Exposure, Food contaminants, Health

### Introduction

The global attention towards the impact of environmental pollution on human health is steadily increasing. Environmental pollutants, generated as a result of human actions, find their way into the environment and subsequently pose hazards to the well-being of both humans and animals. A group of these substances, known as endocrine-disrupting chemicals (EDCs), are gaining significant recognition in the field of public health due to their pervasive effects on human health and potential contribution to illness [1].

The definition of endocrine-disrupting chemicals (EDCs) according to the Endocrine Society delineates them as exogenous (i.e., non-natural) substances or a combination thereof that impede

any facet of hormone activity. The endocrine system is a complex network of internal bodily organs that generate diverse hormones. The primary chemical messengers are transported via the circulatory system to their intended destinations. In order to maintain homeostasis within the human body, the proper functioning of the endocrine system is a vital precondition. Perturbations in hormonal functioning may arise due to both endogenous and exogenous contributors [2,3].

Endocrine disrupting compounds (EDCs) can be exposed to organisms and humans through various routes. These include dermal contact, ingestion, and inhalation of chemicals present in the environment. Exposure to EDCs has the potential to disrupt the balance of hormones, thereby leading to a multitude of health ailments. These can manifest as various developmental and reproductive irregularities, a higher incidence of hormone-sensitive cancers, delays in neurodevelopment, atypical growth patterns in children, and modifications in immune system functionality [4, 5, 6].

EDCs are a heterogeneous group of synthetic chemicals that are utilized in various contexts. This group encompasses chemicals employed in industrial applications and their by-products, such as polychlorinated biphenyls (PCBs), polybrominated biphenyls (PBBs), and dioxins. Additionally, plastics like bisphenol A (BPA), plasticizers like phthalates, and pesticides like methoxychlor (MXC), chlorpyrifos, and dichlorodiphenyltrichloroethane (DDT) are commonly found within this group. Certain EDCs were specifically designed to possess extended half-lives for industrial purposes, earning them the classification of "persistent organic pollutants" (POPs). Notable examples of such POPs include PCBs, dichlorodiphenyldichloroethylene (DDE), dioxin, organochlorine pesticides, and hexachlorobenzene (HCB) [7].

Therefore, this article reviewed of exposure status of EDCs, and of described EDC-related health risks, focusing on the main highlighted EDCs, such as dioxins/PCBs, DDT/DDE, bisphenol A, phthalates, alkylphenols, and phytoestrogens.

## Method and materials

In this systematic review, we employed specialized databases, namely Google Scholar, Science Direct, Elsevier, Springer, Scopus, and PubMed, to conduct a comprehensive literature search. To focus our search on the most recent findings, we utilized the following keywords: “endocrine,” “exposure,” “food contaminants,” and “health”.

## Results and discussion

Phthalates, which are commonly used as plasticizers in various products, have been found to have negative effects on the endocrine system. This particular category encompasses a wide range of chemical compounds known as phthalic acid esters (PAEs), which are commonly utilized across various industries. The most frequently encountered phthalates include Diethyl phthalate (DEP), Di-(2-Ethylhexyl) phthalate (DEHP), Diisononyl phthalate (DINP), Di-isodecyl phthalate (DIDP), Benzyl Butylphthalate (BBP), and Di-n-butyl phthalate (DBP), which find common application in the realm of food packaging and the production of food-contact plastics. Phthalates and pesticides

have been associated with anti-androgenic effects, which can impact the male reproductive system and neuroendocrine functions [8]. Terephthalate, specifically p-phthalates terephthalic acid (TPA) and dimethyl terephthalate (DMT), has been found to have endocrine-disrupting effects. In vitro studies on murine adipocytes showed that exposure to TPA and DMT increased cellular lipid content and induced adipogenic markers, such as PPAR-γ, C/EBPß, FABP4, and FASN . These effects were mediated by the estrogen receptor, as they were reversed by an estrogen receptor antagonist. TPA and DMT also affected adipocytes' thermogenic program and induced the proinflammatory pathway [9]. Additionally, plasticizers like terephthalate can be released from medical devices and have hormonal activities. For example, the 5-OH metabolite of mono-(ethylhexyl)terephthalate (5-OH-MEHT) showed endocrine-disrupting effects, including a 16-fold increase in estrogen synthesis [10]. Dioxins comprise biphenyls, polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and similar substances[11]. According to the United States Environmental Protection Agency (US EPA), a significant proportion, specifically at least 90%, of human encounters with dioxins in their daily lives emanate from animal food products that have been contaminated, notably meat, animal fat, and dairy products. Dioxins have been shown to have adverse effects on the endocrine system, including disruption of hormone receptors such as androgen, estrogen, glucocorticoid, and thyroid hormone receptors [12,13]. These effects can lead to a variety of health issues, including reproductive defects, neurobehavioral abnormalities, and endocrine toxicity. Bisphenol A (BPA) is known as an endocrine-disrupting chemical that can disrupt the endocrine system by imitating natural estrogens and binding to their receptors, leading to similar effects as metabolic syndrome. It has been identified as a risk factor for obesity and diabetes, as it can stimulate the hypertrophy of adipocytes and alter the endocrine system. BPA exposure has also been associated with the disruption of adipocytokines, which can contribute to the development and progression of chronic diseases, including different types of cancers. Furthermore, BPA exposure has been shown to impair cardiac excitability through intracellular mechanisms, leading to an increased risk of developing cardiovascular diseases, such as atherosclerosis, hypertension, and diabetes. BPA acts as an obesogenic, promoting adipogenesis and causing metabolic and endocrine disruptions that contribute to the development of metabolic syndrome. BPA exposure has also been linked to reproductive health issues, including menstrual irregularities, impaired fertility, and polycystic ovary syndrome (PCOS) [14].

Table 1. Endocrine-disturbing compounds and their properties

| Endocrine-disturbing compounds | Main source | Dietary exposure | IARC group classification |
|---|---|---|---|
| Bisphenol-A | polycarbonate plastics, epoxy resins | canned food | 2A |
| Dioxin | By-product in manufacturing and disposal processes (Organochloride manufacture, paper bleaching) | Milk and milk products, , eggs, fish, Bovine tissue | 1 |
| Phetalate | plasticizers and pesticides, detergents | legumes, vegetables and cereals | 2B |
| Pesticides | waste recycling factories, and municipal solid waste incinerators), pesticides seafood, poultry | vegetables and fruits, meat, dairy products, and fish | 2A<br>2B<br>3 |

Conclusion

The wide-ranging scope of this comprehensive assessment, which identifies adverse effects on human health caused by a variety of endocrine-disrupting compounds (EDCs), indicates that there are noteworthy hazards to human well-being. Consequently, it is advisable to adopt a precautionary stance and implement human biomonitoring of EDCs.

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## *Comprehensive management of diabetes mellitus at the end of life*

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Introduction and AIM

The increasing prevalence of diabetes, its management has faced many challenges. One of the challenges is the management of diabetes in the context of terminal care. In the final stage of life-threatening diseases, palliative care becomes a central element in the holistic management of diabetes. In these cases, the etiology of hyperglycemia is multifactorial. Unbalanced blood glucose levels may be associated with worsening several physical symptoms.

The purpose of this literature review was to identify the standard guidelines for managing diabetes in end-of-life care.

Methods

Literature search and standard data extraction were performed using PubMed, Medline, and EMBASE databases. 345 articles were removed from the total of articles identified based on the inclusion principles and finally, the remaining 16 articles were reviewed in detail.

Results

Diabetes management at the end of life, guided toward the overarching aim of making care decisions that align with the patient's unique condition, while judiciously avoiding futile treatment measures. The ultimate objective is to enhance the patient's quality of life. Currently, a universally accepted standard for guiding physicians in diabetes care at the end of life remains elusive. Most studies recommend tailoring blood glucose ranges and HbA1c targets to the individual patient's condition. However, some references advocate maintaining blood sugar levels within the range of 10-15mmol/L. Decisions regarding the initiation, continuation or cessation of diabetes medications hinge on the disease prognosis and the patient's estimated life expectancy. To make the best decisions, several considerations must be underscored:

1. Hypoglycemia and hyperglycemia are troublesome, so appropriate treatment is recommended to alleviate the patient's suffering.

2. Effective communication with the patient and their family members plays an instrumental role in the decision-making process.

3. Equally pivotal is the education and support of the patient's family.

Conclusions

The main objective of this literature review is to facilitate the care of diabetic patients in the final stage of life-threatening diseases and to provide comprehensive guidance for the management of their suffering. Decision making in these patients based on individual conditions and with the participation of the family will lead to the best results.

Keywords: Diabetes management, End of life care, Life-threatening disease

## *Behaviorism of Non-Coding RNAs in the Pathogenesis of Non-Small Cell Lung Cancer: Potential Effects and Hopes of MicroRNAs-based therapies with Precision Medicine Development Approach*

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Purpose

Lung diseases account for a large part of the world's deaths, among which the role of lung cancer, which has been one of the important issues of the World Health Organization [2][3][14], is prominent. Also, non-small cell lung cancer (NSCLC) includes more than 80% or 85% of cases[2][3]. But why has precision medicine recently revolutionized cancer treatment [5][10][11]? The purpose of this narrative review is to investigate the role of Non-Coding RNAs (ncRNAs) in the development and treatment of NSCLC with a precision medicine approach.

Methods

An extensive search was conducted in “PubMed” and “Google Scholar” databases, and we found 35 articles related to our topic, paying special attention to articles published in the last 5 years.

Results

In line with new diagnostic and prognostic approaches, it has been found that the interaction of MicroRNAs (miRNAs) in the pathogenesis of lung cancer contributes to prognosis [4][5][8][9]. For example, the presence of some specific miRNAs such as “miRNA-10b”, “miRNA-34a” and “miRNA-155” as distinct biomarkers is recognized as a prognostic factor for cancer [1][4][9][10]. Also, paying special attention to their ability to increase the expression of proteins responsible for cell apoptosis such as “BCL2L11” and “Cytochrome C” in “in vitro” and “in

vivo" models, reveals the importance of their study from the perspective of personalized medicine [1][5][7][11][13].

## Conclusion

Investigating the behavior of ncRNAs in early stage NSCLC patient samples with the approach of classifying patients into distinct risk groups is known as a big step for the development of precise treatments based on ncRNAs [5][6][7][11][13].


## Keywords

Non-Coding RNAs; miRNA; Precision Medicine; NSCLC; Lung Cancer


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## *Investigating the effect of combined use of selenium and Myo-inositol supplements on thyroid function and autoimmune characteristics in thyroid disorders: a systematic review and meta-analysis*

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Abstract

Background: This study aimed to systematically review the effect of selenium and inositol combination on thyroid function, autoimmune characteristics in thyroid diseases.

Method: To identify eligible studies, a systematic search was conducted in the PubMed/MEDLINE, Science-Direct, CINHAL, EMBASE, SCOPUS, Psychinfo, Cochrane, ProQuest, and Web of Science were searched using the main concepts, and all English-written articles that were published between 2007 and 2022 and had an available full text were examined.

Results: The data analysis of this research revealed that after the simultaneous use of selenium and inositol supplements, the level of Triiodothyronine(T3) increased by 0.105 in patients with thyroid disorders although this increase was not significant (P-value: 0.228). The level of Thyroxine (T4) significantly increased by 0.06 (P-value: 0.04). Anti-Thyroid Peroxidase Antibody (TPOAb) titer decreased by 119.36%, which was not significant (P-value: 0.070). Finally, the level of Thyroid-stimulating hormone (TSH) decreased by 1.45%, which was a significant change (P-value: 0.001).

Conclusion: It was observed that simultaneous use of selenium and inositol supplements did not change the T3 and TPOAb titer levels; however, it leads to a decrease in TSH and increase in T4 levels. Further studies are required due to the limited number of studies

Keywords: TSH, thyroglobulin antibody (Tg Ab), thyroid peroxidase antibody (TPO Ab), triiodothyronine (T3), thyroxine (T4), selenium, inositol, systematic review, meta-analysis

## *Evaluating the Potential of Probiotics in Weight Management and Obesity-Related Factors in Older Adults: A Scoping Review*

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Abstract

Purpose: The use of probiotics in the management of obesity in older adults is a topic of growing interest. Probiotics can affect food intake, appetite, body weight, body composition, and metabolic functions. Also, they may act as anti-obesity agents through various modes of action, including the modulation of specific gut microbiota strains, gastrointestinal and immune system modulation, lowering insulin resistance, and promoting greater satiety. This scoping review inspected the effects of probiotics on weight, anthropometric indices, and obesity-related factors in older adults.

Methods: After defining the research question and objectives, a literature search was conducted based on the main keywords "obesity," "probiotic," and "older adults" in PubMed, Scopus, Web of Science, and Embase. Eligible studies were selected, and their data were extracted by two authors independently.

Results: Out of 697 records, 9 studies were included in this scoping review. The data analysis indicated that a combination of Lactobacillus and Bifidobacterium genera could potentially impact the anthropometric indices of older adults. However, it was not feasible to identify the specific effective species.

Conclusion: This scoping review found that while some studies showed a potential effect of probiotics on weight, anthropometric indices, and obesity-related factors, the evidence is not conclusive, and specific probiotic species cannot be definitively recommended for treatment. More research is needed to determine the effectiveness of probiotics in managing obesity in older adults.

Keywords: Probiotics, Obesity, Aged, Body Weights and Measures

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## *History of osteoporosis: A brief review literature*

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Introduction: Although the term "osteoporosis" is relatively modern, derived from the Latin parts "Oste" meaning "bone" and "porus" meaning "hole" it seems that humanity has grappled with this condition for a long time. It appears that ancient medical texts, especially in Iranian traditional medicine, may reveal traces of similar diagnoses and therapeutic efforts for its improvement. This article seeks to review the history of osteoporosis by exploring modern sources and comparing it with similar diseases in Iranian medical texts.

Methods: This paper attempts a qualitative study of a bibliographical nature to examine the historical aspect of osteoporosis in English articles listed in the PubMed database and to compare it with similar diseases in Iranian medical books (using Jaami Tibb software).

Findings: The first known use of the term "osteoporosis," according to the Oxford Dictionary of the British Medical Review, dates back to 1841. Upon reviewing the PubMed database and filtering historical articles using the keyword "osteoporosis," 283 articles were found. After examining various vocabularies in Persian medicine, the term "Reeh al-Shawkah" exhibited the highest compatibility with the symptoms. In the Jaami Tibb, 56 entries were found for this term which has been explained in the main text.

Conclusion: It appears that modern medicine, since 1841, by introducing the term “osteoporosis,” and Persian medicine, at least since 1037, by introducing the term “Reeh al-Shawkah,” have been engaged in identifying osteoporosis. Future clinical studies are suggested to investigate the effectiveness of Persian medicine treatments for "Reeh al-Shawkah" in the treatment of osteoporosis.

Keywords: Osteoporosis, Reeh al-Shawkah, history, Persian medicine

## *The geographic medicine of vitamin D deficiency in the rural population of Bushehr Province*

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Backgrounds: Ultra violet B photons undergo less scattering and absorption by traversing the thinner atmosphere of the mountainous areas. The resulting effect will be sufficient exposure to UV B for synthesis of more vitamin D in the epidermis of the mountain dwellers than the plain dwellers.

Methods: The rural inhabitants of more than 25 years old from three mountainous, plain, and seashore areas of Bushehr province were selected through a stratified multi-cluster random sampling method. After obtaining the participants' demographic and anthropometric data and their past medical history, serum 25-hydroxyvitamin D [25(OH)D] was measured using ELISA.

Results: A total of 1806 rural subjects including 631 (35.0 %) men and 11,75 (65.0 %) women, participated in the study. The subject ages ranged from 23 to 94 years old. The prevalence of vitamin D deficiency and insufficiency were 28 % (505 subjects), 50 % (913 subjects), respectively. A total of 394 subjects (22 %) had sufficient serum vitamin D levels. The age-adjusted median of serum vitamin D levels in the mountainous region was 31.6 ng/dl. However, plain and coastal rural regions showed the lowest age-adjusted medians of serum vitamin D levels (18.35 ng/dl and 18.58 ng/dl, respectively).

Conclusions: The mountainous, and plain regions of the rural areas in Bushehr Province had the highest, and lowest vitamin D levels, respectively. Therefore, systemic vitamin D food fortification and targeted vitamin D supplementation are more recommended for the plain regions in order to combat with vitamin D deficiency in the rural population of Bushehr Province.

Keywords: Vitamin D deficiency, Rural population, Ultra violet, Fortification

## *A review of estrogenic contaminants in food and its detection methods*

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Aim and Background

The presence of estrogen in the body yields beneficial outcomes, yet exogenous estrogens can lead to adverse effects. Introduction of environmental estrogens into the body via dietary intake can result in detrimental effects even at low concentrations. The objective of this review is to assess the contamination of foods with estrogenic compounds and to examine the techniques used for their detection in food products.

Method

On May 14, 2021, our research team looked for English articles in PubMed and Scopus about finding estrogenic compounds in food. They used specific keywords and also searched in Science Direct and Google Scholar to make sure they found all the relevant information.

Results and discussion

9 articles were chosen from 221 studies, after a strict screening process. Environmental estrogens in food can affect the body's metabolism and need to be tracked and measured. Certain estrogenic compounds like Zearalenone and bisphenol A can harm reproductive health. Techniques like LC-MS/MS and GC-MS are used to detect these compounds, with LC-MS/MS being the preferred method. Bioassay tests have shown potential for food monitoring. It is important to monitor environmental estrogens in food to protect public health.

Conclusion

This study found estrogen contaminants in food, including industrial, natural, and synthetic types. Screening tests and bioassay methods can be used to detect these harmful substances. Further research should look into the accuracy of different methods for detecting estrogenic compounds in various types of food.

Keywords: Bioassay, Detection, Estrogen, Food, Analytical methods

## *Association between Junk Food Consumption and severity of non-alcoholic fatty liver disease*

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ABSTRACT

Background and objective: Non-alcoholic fatty liver disease (NAFLD) is a liver manifestation of metabolic syndrome. Evidence shows that dietary patterns of people play a role in the pathogenesis and progression of this disease. The aim of this study is to determine the relationship between Junk Food consumption and the severity of the disease.

Method and material: 100 patients with NAFLD, non-diabetic and without thyroid disorders, in the age range of 20 to 50 years and of both sexes, were included in the study. Weight, height and blood pressure of patients were measured based on standard methods and their body mass index (BMI) was calculated. In order to estimate the dietary patterns of patients, the food frequency questionnaire (FFQ) of 133 food items was completed.

Results: In the present study, 65% of patients were diagnosed with grade 1 fatty liver disease and the rest were grade 2 and 3. The majority were overweight or obese (P=0.014). Significant correlations were observed between junk food products such as: hamburgers and sausages (P=0.002), sweets (P=0.03), pastry products (P=0.03), sweetened drinks and soft drinks (P=0.015).

Conclusion: There is a significant relationship between obesity, consumption of Junk Food such as high-calorie foods and simple sugars with NAFLD.

Keywords: Non-Alcoholic Fatty Liver Disease, Obesity, Carbonated Beverages.

## *The effect of chamomile consumption on glycemic markers: a narrative review*

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Background and Aim: Some randomized clinical trial and animal articles have revealed the blood glucose-lowering properties of chamomile and it is frequently used in traditional medicine for treatment of diabetes. Therefore this narrative review aimed to investigate the impact of chamomile consumption on glycemic control.

materials and 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: “Blood Glucose” OR “Glycated Hemoglobin” OR “homeostasis model assessment-insulin resistance” OR “insulin” AND “chamomile”. The references of retrieved items were also searched to identify additional articles about this topic.

Results: A total of 140 studies were retrieved during the search process, but five trials were included to this review. The total sample size was 289 of which 112 participants were female. Various forms of chamomile were used such as tea, capsule and syrup trials. In most evaluated studies, there was a positive association between chamomile consumption and glycemic control; such as significant decrease in fasting blood sugar, HOMA-IR, Hb A1c and serum insulin levels in the intervention group.

Conclusions: The present review demonstrates that chamomile can elicit significant reductions in serum FBS, HOMA-IR, Hb A1c and serum insulin levels in adults. Moreover, further large-scale and well-designed RCTs are required to confirm the veracity of these findings.

Keywords: chamomile, Blood Glucose, Glycated Hemoglobin, homeostasis model assessment-insulin resistance, insulin

## *Effects of herbal medicine on sleep quality in type 2 diabetes mellitus: a systematic review of clinical trials*

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Abstract

Introduction: The quality of sleep is one of the factors that affect the quality of life and health in diabetic patients which can be a result of impaired glucose metabolism and high level of blood glucose. Previous studies have revealed the relationship between diabetes and insomnia. Regarding the doubt on efficacy and side effects of available treatments, herbal medicines have shown a great potential. Therefore, we aimed to investigate the impact of herbal medicines on sleep quality of patients with type 2 diabetes.

Methods: In this systematic review, relevant keywords and synonyms of "Diabetes", "Sleep quality" and "Herbal medicine" were searched in the Web of Science, PubMed and Scopus to identify eligible randomized clinical trials (RCT) published up to December 2023. Type of the plant, dose and duration of intervention, and significant outcomes were extracted.

Results: From 141 retrieved studies, and finally five articles were selected according to the inclusion criteria. Among the medicinal plants, the effect of Crocus *sativus* L. (4 studies) and

Lavandula *angustifolia* L.(1 study) were evaluated on the sleep quality of diabetic patients. All studies used an RCT design and indicated improvement in sleep quality. These medicinal plants were consumed daily and for 1 to 8 weeks.

Conclusion: According to the results, saffron and lavender showed beneficial effects on the sleep quality of diabetic patients and can be used as an adjuvant treatment to improve the quality of life of diabetic patients; however, more studies with larger sample sizes are needed.

Keywords: Diabetes complications, Sleep quality, Herbal medicine, Diabetes mellitus, Systematic review

## *Titel: Prevalence of depression and anxiety in Iranian Type 2 diabetic patients: Systematic review and meta-analysis*

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Abstract

Introduction: Diabetes mellitus (DM) is a serious disease that is considered as the most common and important metabolic disease in humans. Depression is the most common psychiatric disorder in patients with DM. and its prevalence has been reported to be two times more than the general population. This study aims to estimate the prevalence of depression and anxiety among Iranian patients with diabetes mellitus (DM) through meta-analysis.

Methods: This is a systematic review article based on MOOSE and PRISMA guidelines. Review of the literature was done using databases including Magiran, Barakat Knowledge Network System, SID, RICST, IranDoc, PubMed/Medline, Science Direct, Embase, Scopus, Cochrane Library, Web of Science and the Google Scholar search engine without time limit until December, 2023. Heterogeneity between studies was assessed using Cochran's Q test and $I^2$ index. Data were analyzed using Comprehensive Meta-Analysis (CMA) software version 2 according to a random-effects model. P-values less than 0.05 were considered as the significance level.

Results: The analysis consisted of 53 studies including 11,379 Iranian patients with DM. The prevalence of depression was estimated to be 69.9% (95% confidence interval [CI]: 56.6-76.7). The lowest and highest prevalence of depression based on regions was in the North (46.7% [95%CI: 44.9-67.8]) and the East (74.2% [95%CI: 30.7-87.9]), respectively. The depression prevalence in females and males was 63.9% (95%CI: 54.0-72.8) and 46.3% (95%CI: 36.4-56.4), respectively, The prevalence of mild, moderate, severe and highly severe depression was estimated to be 27.4% (95%CI: 23.0-30.2), 23.1% (95%CI: 18.2-27.9), 16.4% (95%CI: 11.6-19.9), and 6.6% (95%CI: 4.4-7.1), respectively.

Conclusions: Depression and anxiety are more common in Iranian DM patients than in developed countries.Therefore, early diagnosis and treatment of depression and anxiety in these patients requires regular psychiatric visits.

Keywords: Anxiety; Depression; Diabetes mellitus; Iran; Prevalence.

## *Prevalence of sarcopenia In patients with Hip Fracture : Systematic review and meta-analysis*

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Abstract

Introduction: Sarcopenia is a potentially modifiable risk factor for falls and fractures in older adults, prevalence of sarcopenia In patients with Hip Fracture is unclear. This study aims to systematically assess the literature and perform a meta-analysis of the Prevalence of sarcopenia among older adults with Hip Fracture.

Methods: This is a systematic review article based on MOOSE and PRISMA guidelines. Review of the literature was done using databases including PubMed/Medline, Science Direct, Embase, Scopus, Cochrane Library, Web of Science and the Google Scholar search engine without time limit until December, 2023. Heterogeneity between studies was assessed using Cochran's Q test and $I^2$ index. Data were analyzed using Comprehensive Meta-Analysis (CMA) software version 2 according to a random-effects model. P-values less than 0.05 were considered as the significance level.

Results: This study includes 21 studies conducted on patients with hip bone fractures. 1760 elderly patients with hip fracture were examined for sarcopenia. The mean age was 86.2 years, most of the patients were women (81.7%). 77.6% of the women and 73.5% of the men had low muscle strength. The appendicular muscle mass index was below the cut-off points for sarcopenia in 72.4% of the women and 79.4% of the men. The prevalence of sarcopenia was estimated to be 24.5% % (95% confidence interval [CI]: 16.6-31.7). Patients with sarcopenia had a lower body mass index, older age, poorer previous functional status and higher disease burden.

Conclusions: One in four people patients with HF had sarcopenia on admission. Prevalence varied widely depending on the cut-off points selected to define low muscle mass. Sarcopenia could significantly increase the risk of future hip fracture in old people; thus, it is necessary to prevent hip fractures in individuals with sarcopenia.

Keywords: Sarcopenia; hip fracture; meta-analysis; older people; Prevalence.

## *Herbal medicines on Hyperprolactinemia*

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Purpose: Hyperprolactinemia, defined as an increase in serum prolactin levels, can result from physiological, pathological, or drug-induced factors. Approximately 1% of the world's population suffers from hyperprolactinemia. Symptoms can be detectable or remain unnoticed. Evidence suggests that certain herbal medicines may have a controlling effect on hyperprolactinemia. This study aims to review clinically investigated medicinal plants for hyperprolactinemia disorders and their therapeutic properties.

Methods: Data were collected from PubMed and Scopus databases from the year 2000 to 2023 using the search term "hyperprolactinemia" AND "medicinal plant". PubMed yielded 196 articles filtered by clinical trials, with only three related ones. Scopus yielded 622 articles filtered by medicine, article type, and English language, with six articles related to the subject. Two articles were common in both databases.

Results: Seven articles were reviewed, covering four herbal medicines: Peony-Glycyrrhiza, Vitex agnus castus, chamomile, and Fractus agni castus. Peony-Glycyrrhiza reduced prolactin levels compared to placebo in one study but was less effective in another. Peony-Glycyrrhiza was found to be beneficial in treating antipsychotic-induced hyperprolactinemia in individuals with schizophrenia. Vitex agnus castus was effective with lower side effects, and chamomile was less effective than cabergoline in reducing prolactin levels. Fractus agni castus significantly lowered prolactin levels after treatment.

Conclusion: While certain herbal medicines have been clinically investigated for their efficacy in managing hyperprolactinemia, there may be other herbal preparations worth studying, as medicinal plants have noteworthy potential for management of women health

Keywords: hyperprolactinemia, herbal medicine, Persian medicine

## *Pharmacokinetic interactions of berberine with medications of metabolic syndrome components: a comprehensive review*

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Abstract

Purpose: Metabolic Syndrome (MetS) is a cluster of major risk factors associated with cardiovascular diseases, and its components include hypertension, dyslipidemia, diabetes, and obesity. Berberine, an alkaloid from *Berberis* plants, has demonstrated efficacy in ameliorating MetS components. One of the main concerns is herb-drug interactions in the healthcare system. This study aims to comprehensively review the interactions of berberine with MetS medications.

Methods: PubMed and Web of Science databases were searched from inception to December 2023, with keywords “berberine” and “interactions”. Inclusion criteria were preclinical and clinical

studies in English languages investigating the interactions of berberine with pharmacological treatments of metabolic syndrome components. Review studies were excluded.

Results: Among 3199 papers, 13 preclinical and clinical studies were included. Berberine showed potential pharmacokinetic changes, impacting $C_{max}$ and $T_{max}$ when co-administered with antihyperlipidemic, antihypertensive, and antidiabetic agents such as atorvastatin, losartan, and metformin. Mechanistically, inhibition of cytochrome P450 isoenzymes, P-glycoprotein, and microbiota-mediated metabolisms in the gastrointestinal tract underlie these interactions. Only two clinical trials highlighted significant berberine interactions with conventional medications, underscoring the need for further human studies.

Conclusion: In conclusion, co-administering berberine with antihyperlipidemic and antidiabetic agents demonstrates a synergistic impact across various pathways. Dose adjustment considerations are crucial when co-administering berberine with pharmacological medications for MetS in clinical practices. This research provides valuable insights for navigating the complexities of MetS management.

Keywords: Herb-Drug interactions; berberine; metabolic syndrome; herbal Medicine

## *The Western Diet - Gut Microbiota Interaction and Its Role in Happiness: A Mini Review*

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Purpose: There are many studies showing that the gut microbiota affects human health, mental disorders, mood and happiness through the gut-brain axis. On the other hand, diets, eating habits, fiber consumption and probiotics have an effect on the population of gut microbiota and its function, and we will witness psychological changes as a result. Among the common diets in the world, the western diet, which is rich in saturated fatty acids, sugar and protein, is considered as a harmful diet and has harmful effects on the gut microbiota population and brain. In this mini review study, the interaction of this harmful diet with the gut microbiota and its role in happiness has been evaluated.

Methods: The search for articles published with the keywords: [Western diet], [gut-brain-axis], [microbiota], [happiness] and [mental disorders] until July 2023 was done from 'PubMed' and 'Scopus' according to the entry and exit criteria, and related articles were included in the research.

Results: Consuming a high-fat diet causes changes in the gut microbiota composition and reduces its diversity. A Western diet that is high in sugar reduces beneficial bacteria such as: *Bifidobacterium*, *Lactobacillus*, *Lachnospira* and *Ruminococcus*. Due to the abundance of animal proteins, the Western diet reduces bile-resistant bacteria such as *Alistipes* and *Bilophila* and reduces short-chain fatty acids (SCFA) in stool.

Conclusion: Due to the high amounts of fat, processed proteins and sugar, the western diet reduces the population of bacteria related to happiness in the gut and may cause a person to suffer from mental disorders such as anxiety and depression and overall reduces the happiness of a person. The Mediterranean diet, which is rich in vegetables, has more positive effects on happiness and mental health in humans.

Keywords: Western diet; Gut microbiota; Happiness; Mental disorders

## *The role of faecalibacterium prausnitzii in the progression of Alzheimer's disease and amyloid plaque formation in the neuron cell culture and animal models*

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Purpose: Neurodegenerative diseases such as Alzheimer's are among the multi-factor diseases that contribute to many factors, including bacterial factors. These factors are affected by the gastrointestinal microbiota. Today, the importance of gastrointestinal microbiota has been considered in the development of neurodegenerative diseases. The purpose of the present study is to evaluate the effect of *Faecalibacterium prausnitzii* on memory, anxiety, and obsessive-compulsive compulsiveness in rat and cellular AD model.

Method: In this study, using primary hippocampal cell culture and MTT test, the effect of neurons of amyloid beta protein and the effect of *F. prausnitzii* on neuronal protection was evaluated. Also, the state of memory, anxiety, and obsessive-compulsive disorder in AD rats were gavaged with *F. prausnitzii* was evaluated by Morris Water Maze (MWM), Elevated Plus Maze (EPM) and Marble Burying Test (MBT) respectively.

Results: An increase in the survival rate of AD primary hippocampal cells infected with *F. prausnitzii* was observed, compared to control cells. Although the neuronal protection effect of this strain has been confirmed, no significant difference has been reported. Also, in the AD animal model gavage with *F. prausnitzii*, compared to the control sample, the observations state that learning, stronger memory, and obsessive behavior are more.

Conclusion: *F. prausnitzii* can be useful and effective for improving memory power, but intensify obsessive behaviors. More studies are needed to confirm and introduce effective strategies to improve the control of neurodegenerative diseases in relation to microbiota.

Keywords: Alzheimer's disease, *Faecalibacterium prausnitzii*, amyloid plaque, neuron cell model, microbiota

## *Personal medicine and polycystic ovary syndrome (PCOS): A review study*

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Purpose: Polycystic ovary syndrome (PCOS) is an endocrine disorder affecting reproductive-aged women. Personal medicine, with its focus on customization of treatment based on individual characteristics, has gained prominence in PCOS management. This systematic review aimed to evaluate the evidence on the application of personal medicine in PCOS.

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: Key findings highlighted the potential of certain genetic variants, such as those involved in insulin and androgens metabolism, as prognostic indicators for specific PCOS phenotypes. Epigenetic modifications were found to play a role in the pathogenesis of PCOS, providing potential targets for therapeutic interventions. Predictive models integrating clinical, molecular, and lifestyle variables demonstrated promise in identifying individuals at higher risk of developing PCOS or its long-term complications.

Conclusion: This systematic review underscores the role of personal medicine in PCOS management, offering valuable concepts about disease mechanisms, risk prediction, and personalized treatment strategies. The integration of various omics technologies and sophisticated predictive models has demonstrated the potential to improve diagnostic accuracy, identify therapeutic targets, and optimize patient outcomes. Future researches should focus on prospective validation and clinical implementation of these personal medicine approaches in routine PCOS care.

Keywords: personal medicine, polycystic ovary syndrome, genetic profiling, personalized treatment

## *3D printing technology and diabetic foot wound healing: A review study*

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Purpose: Diabetic foot wound is a challenging problem affecting a significant portion of the diabetic population. Conventional wound healing methods have limitations, necessitating the exploration of alternative approaches. This systematic review aims to provide a comprehensive overview for 3D printing application in diabetic foot wound healing.

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. Key findings highlighted that various advancements in 3D printing techniques have enabled the fabrication of personalized wound dressings, scaffolds, and tissue-engineered constructs. These interventions offer precise control over the geometry, porosity, and mechanical properties, facilitating optimal wound healing. Furthermore, the incorporation of bioactive materials, growth factors, and cells into 3D-printed constructs has demonstrated enhanced cellular proliferation, angiogenesis, and tissue regeneration. The use of additive manufacturing techniques promotes patient-specific treatments, leading to improved outcomes and reduced healing time.

Conclusion: This systematic review underscores the potential of 3D printing technology as a valuable tool in diabetic foot wound healing. Further research and clinical trials are necessary to establish standardized protocols, assess long-term effectiveness, and ensure regulatory compliance to improve quality of life for diabetic patients.

Keywords: 3D printing, diabetic foot wound healing, tissue engineering, tissue regeneration

## *Nanotechnology and insulin therapy: A review study*

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Purpose: Nanotechnology has emerged as a promising field in biomedical research, with numerous applications in pharmacology. Insulin therapy is pivotal in managing diabetes, but conventional therapy methods have limitations. This systematic review aims to provide an overview of nanotechnology-based strategies employed in insulin therapy and their efficacy.

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

Results: A total of 15 studies met the inclusion criteria. Various nanotechnology platforms, including nanoparticles, liposomes, micelles, and hydrogels, were employed for insulin therapy. These platforms facilitated improved pharmacokinetics, enhanced bioavailability, prolonged release, and targeted insulin therapy. Several studies demonstrated superior blood glucose control, reduced hypoglycemia risk, and enhanced patient compliance compared to traditional methods. Safety profiles were generally favorable and minimal adverse effects reported.

Conclusion: Nanotechnology-based systems offer significant potential in revolutionizing insulin therapy. The reviewed studies highlight the advantages of nanocarriers in improving insulin therapy, achieving precise dosage control, and enhancing treatment outcomes. However, further research is required to optimize nanocarrier design and ensure long-term safety. The integration of nanotechnology in insulin therapy holds promise for personalized diabetes management and improved quality of life for patients.

Keywords: nanotechnology, insulin, pharmacology, nanoparticle

## *Nanofibers for Targeted and Sustained Delivery of Hormones in Endocrine Disorders*

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Aim and background:

Nanofibers have recently emerged as a promising platform for treating and managing endocrine disorders. These disorders are characterized by the malfunctioning of the endocrine system, which regulates the production and release of hormones in the body. If left untreated, these disorders can lead to significant health complications, making effective therapeutic intervention of utmost importance. Nanofibers offer unique advantages in the field of endocrine disorders due to their high surface area to volume ratio, tunable properties, and ability to mimic the extracellular matrix. This enables them to closely interact with cells and tissues, facilitating targeted and controlled drug delivery.

Method:

To investigate the potential use of nanofibers in the treatment of endocrine disorders, studies were conducted using databases like PubMed, Science Direct, and Google Scholar by searching for the keywords "Endocrine disorders", "drug delivery" and "nanofibers". We have not had a time limit for search, and any article that has the requirements of the entry was read until January 2024. Out of 40 articles found a small number of conditions; Includes: Complete article, electrospinning and targeted drug delivery. Finally, 8 articles were evaluated.

Result and discussion:

The results of these studies have shown that nanofibers can be used for the delivery of hormones and other bioactive compounds. By encapsulating these substances within nanofibers, sustained and controlled release can be achieved, mimicking the physiological release patterns and improving treatment efficacy. Moreover, the use of nanofibers can protect the encapsulated compounds from degradation and enhance their stability. Furthermore, nanofibers can be functionalized with specific ligands or receptors to achieve the target tissue or tissues. This enables precise modulation of hormone levels and reduces the potential side effects associated with systemic therapies.

Conclusion:

In conclusion, nanofibers hold great promise for the treatment and management of endocrine disorders. Their unique properties and versatile functionalities enable targeted and sustained delivery of hormones and other bioactive compounds, as well as promoting tissue regeneration.

Keywords:Nanofibers; Endocrine disorders; Drug delivery, Hormone

## *Keeping Pets at Home and Vaginal Health in Their Owners: A Mini Review*

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Purpose: One Health is the interdependence of humans and animals and the understanding that they not only share the same environment, but also interact microbially with each other. Studies have shown that pets and their owners share microbiota between them, which can affect each other's physical and mental health. Vaginal microbiota diversity is influenced by several factors. This mini review study explores the relationship between keeping pets and women vaginal microbiota from the perspective of One Health and summarizes existing studies on this nexus.

Methods: Studies published until February, 2023 were retrieved from Science Direct, Pub Med, Web of Science and Scopus. Upon completion of the database search, 245 records were identified. Following the elimination of duplicate entries, 172 unique results were retained for further analysis. Finally, 6 articles were selected for final review.

Results: *Lactobacilli* dominate the vaginal flora in the normal state. Pet ownership can affect vaginal microbiota. While vaginal microbiota changes, it becomes susceptible to infections. As pathogenic organisms may ascend from the vagina to the upper genital tract, resulting in infertility. Keeping cats and dogs in the home may be linked to urinary tract infections (*E. coli*) in women.

Conclusion: As pet ownership continues to rise, there is a good deal of evidence revealing a relationship between the microbiota of pet owners and their pets. While studies suggest limited transmission of pathogens from pets to individuals. Pets noticeably impact the microbiota of their owners. These interactions have been beneficial or harmful to humans. The microbiota homeostasis of humans and animals is also linked to their overall health. Finally, further research is needed for a comprehensive understanding of the relationship between living with pets and vaginal health in their owners.

Keywords: Vaginal microbiota; Pet; Cat; Dog; One health

## *Systematic review of the mechanism of ferroptosis induced by medicinal plants on cancer*

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Abstract

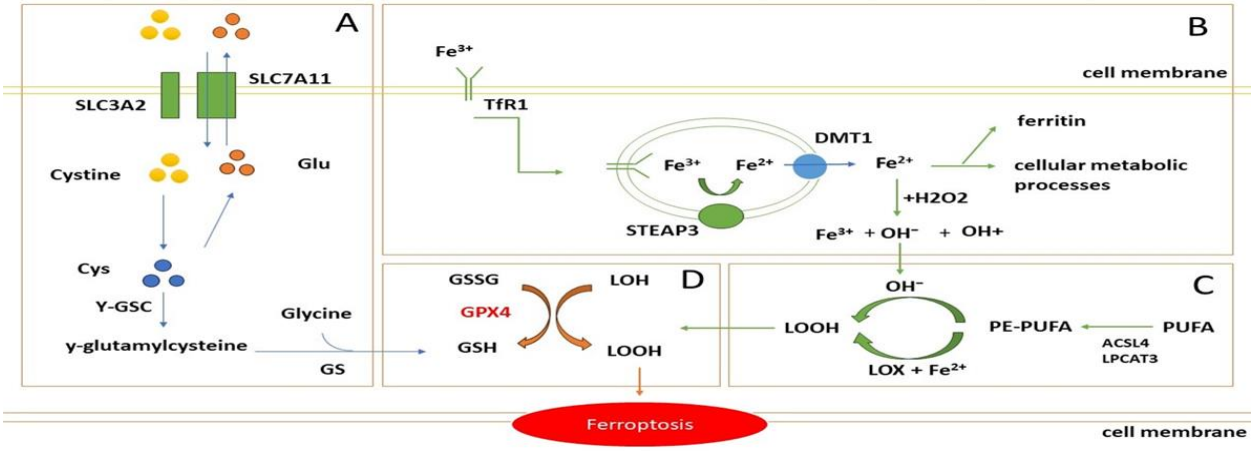
purpose: The significance of natural bioactive compounds in food and medicinal plants has grown due to their diverse biological activities and minimal toxicity. This review explores their role in modulating ferroptosis, a form of cell death involving lipid peroxidation and membrane degradation. Ferroptosis is associated with elevated iron, reactive oxygen species (ROS), and malondialdehyde, demonstrating established anti-cancer activity.

Methods: A systematic search on Google Scholar and PubMed databases was conducted using keywords such as "Ferroptosis," "cancer," and "medicinal plants." Inclusion criteria involved English articles with no time limit. Out of 22 initially identified articles, 11 were deemed relevant to the topic.

Results: Treatment-resistant cancer cells show increased susceptibility to ferroptosis. Pharmacological modulation of ferroptosis, encompassing both induction and inhibition, holds promise for drug-resistant cancers and diseases linked to lipid peroxidation. Key mechanisms include Glutathione depletion(A), Lipid peroxidation(C), Iron metabolism(B), GPX4 inhibition(D) (Figure1) .Natural compounds like Apigenin, Artemisinin derivatives, Baicalein, and Curcumin regulate ferroptosis.

Conclusion: The molecular mechanism of ferroptosis remains dynamic, and recent research highlights natural phytochemicals from edible plants as novel ferroptosis regulators. This review provides an updated overview of ferroptosis mechanisms and presents a comprehensive collection of natural bioactive compounds known to regulate ferroptosis.

Keywords: Ferroptosis, Cancer, Medicinal plants



## *"Fenugreek and Metabolic Syndrome: A Scoping Review Integrating Traditional and Contemporary Perspectives"*

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Purpose: This scoping review explores potential role of fenugreek (*Trigonella foenum-graecum*), in mitigating MetS, blending traditional insights with contemporary research.

Methods: This scoping review explores potential role of fenugreek (Trigonella foenum-graecum), in mitigating MetS, blending traditional insights with contemporary research.

Results: Finally, ten studies that met the inclusion criteria were selected. Studies included participants with type 2 diabetes, obesity, PCOS, hyperlipidemia, NAFLD, and MetS. Fenugreek doses ranged from 0.5 to 100 g/day, administered through capsules, powders, extracts, and germinated forms, with durations spanning 1 week to 180 days. Significant outcomes were observed in fasting blood glucose, HbA1c, lipid profiles, blood pressure, and BMI. However, variations in effectiveness were noted, emphasizing the need for tailored interventions.

Also based on traditional Persian medicine resources Fenugreek has a hot and dry temperament, with different mechanisms like eliminating thick materials, eliminating waste materials, improving digestion and gastrointestinal tract, improving the function of liver and pancreas could be beneficial for MetS.

Conclusion: Overall, fenugreek demonstrated potential in mitigating MetS components, providing valuable insights for future researches and clinical applications.

Keywords: Metabolic syndrome, Fenugreek, Persian Medicine, type 2 Diabetes Mellitus, Obesity

## *The effects of ginger on dyslipidemia: An umbrella review of systematic reviews and meta-analyses*

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Abstract

Purpose: Dyslipidemia (DLP) is one of the main risk factors for cardiovascular disease. While lipid-lowering medications have shown several side effects, the therapeutic effects of the rhizome of Zingiber *officinale* Roscoe (ginger) on DLP have been demonstrated. We aim to overview the systematic reviews and meta-analyses investigating the antihyperlipidemic effects of ginger.

Methods: PubMed, Cochrane Library, and Web of Sciences web databases were systematically searched in accordance PRISMA2020 with keywords “dyslipidemia”, “ginger”, and “*Zingiber officinale*” until December 2023. Systematic reviews and meta-analyses of randomized controlled trials (RCTs) evaluating the effects of ginger on DLP, as well as English language studies, were

included. Systematic reviews without meta-analyses assessment and irrelevant studies were excluded.

Results: From 1217 retrieved studies, 8 meta-analysis studies met the inclusion criteria. Doses from 0.2 to 4 g/day of ginger were evaluated on lipid profiles in 4094 patients with diabetes mellitus, obesity, and metabolic syndrome, for 2 to 24 weeks. The results showed significant effects of ginger on increasing high-density lipoprotein cholesterol (HDL-C) and decreasing total cholesterol (TC), low-density lipoprotein cholesterol (HDL-C), and triglyceride (TG). The highest improvement in serum levels of HDL-C, LDL-C, TC, and TG were 2.87, 6.66, 8.22, and 24.80 mg/dl, respectively. The effective dose was reported less than 1 g/day.

Conclusion: This study showed that utilizing ginger has favorable effects on modulating DLP, mostly in patients with diabetes mellitus and obesity; however, more well-conducted RCTs with larger sample sizes are required to confirm our results and also to determine the effective dose of ginger.

Keywords: Dyslipidemias; *Zingiber officinale*; medicinal plants; Meta-Analysis

## *Analyzing the genotype frequency of rs763964554 CYP2D6 gene in the Iranian Population*

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Abstract

Background: Polymorphisms identified in the genes encoding a number of cytochrome enzymes, such as CYP2D6, can be effective in metabolizing a large number of drugs, and by determining the frequency of genotypes in certain ethnic groups, they can check the patient's response to different drugs. The aim of the present study is genotype frequency analysis of rs763964554 cyp2d6 gene polymorphism in the Iranian normal population.

Materials and Methods: Sequencing of 389 Iranian volunteers was performed by the Sanger method and the genotype sequence of the rs763964554 polymorphism of the CYP2D6 gene was determined in the studied samples. The samples were analyzed in the software. chromas and with the help of the chi-square test.

Results: The frequency of allele G as the reference allele shows G=1.00 and the frequency of allele A as the replacement allele A=0.00. The wild genotype of the rs763964554 polymorphism in the normal population of Iran with specific ethnicity is CYP2D6*1.1*, and due to the absence of the mutated allele (CYP2D6*1.96*), it shows an extensive metabolism phenotype (EM-Normal).

Conclusion: According to the conducted research, it can be concluded that the allelic frequency pattern of rs763964554 is similar to American and African populations

Key words: Pharmacogenetics , CYP2D6 , rs763964554.

## *Genotype frequency analysis of rs28371735 CYP2D6 gene in the Iranian Population*

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Introduction: Most of drugs are frequently metabolized in the liver by cytochrome P450 enzymes, one of the important one is CYP2D6, which is responsible for the metabolism of more than 25% of drugs. We aim to study the frequency of rs28371735 variants in the normal Iranian population.

Purpose: The purpose of this research is to investigate the frequency of the studied gene polymorphism genotypes in the normal Iranian population.

Materials and Methods: In the present study, the genotype frequency of rs28371735 polymorphism is determined by Sanger Sequencing method.

Results: All 389 samples examined in the study showed the wild heterozygous genotype with CYP2D6*1/*36 diplotype, and homozygous wild and homozygous mutant genotypes were not observed.

Key words: Pharmacogenetics , CYP2D6 , rs28371735.

## *Prevalence of Sarcopenia and Its parameters in Iranian Older People: The results of Iranian Multicenter Osteoporosis Study (IMOS-2021)*

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Background: Sarcopenia is an age-related muscle disease with an increasing risk of disability, poor quality of life, and mortality. This study proposed the prevalence of sarcopenia and its parameters in Iran.

Methods: This study was a cross-sectional study that was conducted within the framework of the Iranian Multicenter Osteoporosis Study (IMOS-2021). IMOS is a population-based, cross-sectional survey conducted in Iran to estimate the prevalence of osteoporosis, Osteopenia, sarcopenia, and their possible related risk factors in the country. Sarcopenia was defined as a reduced skeletal muscle mass plus low muscle strength and/or low physical performance. The cutoff points of muscle mass values below 5.4 $kg/m^2$ for women and 7.0 $kg/m^2$ for men were classified as low skeletal muscle index (SMI). Related cut-off points for low muscle strength were defined as <26 kg for men and <18 kg for women. Participants with a gait speed of less than 0.8 m/s were considered to be cases with low muscle performance for both genders.

Results: Among 1450 participants aged ≥50 years, 792 (54.6%) were women. The prevalence of sarcopenia was 9.04% (95% CI 6.88-11.79) in men and 10.23% (8.12-12.81) in women. When we assessed the prevalence in people over 60 years, this number was 14.04% (95% CI 11.54-16.98) in our country. In both sexes, the prevalence of sarcopenia in rural and urban was not significantly different. The prevalence of low SMI, low muscle strength, and low gait speed was 33.26%, 23.53%, and 56.30%, respectively. The prevalence of low SMI (41.19% vs. 26.63%) and low gait speed (44.62% vs. 66.06%) among men was significantly higher than among women (P<0.001). Also, the prevalence of low muscle strength among women was greater than among men (29.63% vs. 16.22%). Although the prevalence of low SMI was higher in urban than rural, the prevalence of low muscle strength and low gait speed was greater in rural than urban.

Conclusions: Results demonstrated a high prevalence of sarcopenia and its parameters in both sexes suggesting a high disease burden in a rapidly aging country.

## *The main sources of calcium in the food basket of Iranian adults; The results of Iranian Multicenter Osteoporosis Study (IMOS-2021)*

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Purpose

Understanding the calcium consumption patterns within the food basket of Iranian households is crucial for addressing potential nutritional deficiencies and implementing effective public health interventions. This study investigated the main sources of dietary calcium intake in the food basket of Iranian population aged ≥50 years.

Methods

This study utilized samples from the Iranian Multicenter Osteoporosis Study (IMOS-2021). Individuals aged ≥50 years, completed a 168-item food frequency questionnaire (FFQ). The mean calcium intake per day and share of calcium from each food item was calculated using the N4 software. STATA statistical software was utilized to conduct a survey set analysis, aiming to estimate the mean dietary consumption of calcium and main sources of calcium in the food basket of Iranian adults were calculated using Excel software.

Results

Overall, 1446 participants (54.5% women) with the mean age of 60.7 (range: 50-94) were included. The weighted mean dietary calcium intake in Iran was estimated 1062.7 mg/d (95%CI: 1029.3-1096.2). Total dietary calcium intake in IMOS-2021 was 1502402.9 mg/d. The main sources of dietary calcium intake in the food basket of Iranian adults were 13% by yogurt, 12% by dough, and 10.7% by cheese, respectively. Our results indicated that 53.2% and 19.3% of calcium intake in the food basket of Iranian adults were from dairy products and grains.

Conclusion

Our results showed that dairy products and grains are the main sources of calcium in the food basket of Iranian adults. Taking public health interventions to maintain sufficient amounts of dietary calcium intake from food products is recommended.

Keywords: Calcium intake, FFQ, Food basket, Iran

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## *Prevalence of Dysmobility Syndrome in population aged 50 years and over: the results of Iranian Multi-center Osteoporosis Study (IMOS-2021)*

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Purpose

Dysmobility syndrome is a geriatric condition that broadly consider bone-muscle-adiposity all together and associates with mortality and other adverse consequences such as fractures in the

elderly population. This study investigates the prevalence of dysmobility in the Iranian population aged 50 years and over.

Methods

We used data of the Iranian Multi-center Osteoporosis Study that is a national population-based study to assess the prevalence of osteoporosis, sarcopenia and their associated factors. In all, 1353 individuals with complete data were included in this study. Dysmobility was defined as the presence of ≥3 items of the following conditions: osteoporosis (a T-score of ≤-2.5 at either lumbar spine, femoral neck, or total proximal femur), at least one fall in the preceding year, low appendicular lean mass (≤5.45 kg/m2 in women or ≤7.26 kg/m2 in men), slow gait speed (<1.0 m/s), low hand-grip strength (<30 kg in men and <20 kg in women) and high fat mass (>30 for men and >40 for women). The same protocol and similar tools were used to measure body composition, grip strength and gait speed in all study centers.

Results

The overall prevalence of dysmobility was 51.6% (95%CI:45.4-51.5). The higher prevalence was detected in women compared to the men (62.5% vs. 38.9%, p-value<0.001). Considering the population aged ≥65 years, the prevalence rose to 70.7% (95%CI:65.5-75.5). In elderly women, the prevalence was 82.7% (95%CI:76.2-87.8). There was no significant difference between rural and urban population.

Conclusion

Dysmobility is very common in the Iran especially in the elderly population. Considering the importance of this syndrome on general health, having preventive strategies seems necessary.

Keywords: Elderly, Prevalence, Dysmobility, Iran

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## *Energy Consumption for Water Treatment Processes and Non – Communicable Diseases Dispersion; with an Emphasis on Cardiovascular Diseases*

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Abstract:

Introduction: Energy consumption in water treatment plants (WTPs) is a fundamental component of ensuring safe water supply, yet it holds implications beyond environmental sustainability, particularly in its association with health outcomes.
Method: This review delves into the intricate relationship between energy demands in water treatment facilities and the potential impact on cardiovascular disease, a prevalent non-communicable disease (NCD) known for its significant burden on global health systems.
Results: WTPs, essential for treating and distributing clean water, rely on energy-intensive processes that can contribute to environmental stressors. The excessive energy consumption associated with these facilities has indirect repercussions on public health, specifically cardiovascular health issues. The water footprint of energy consumption, including greenhouse gas emissions and air pollution, catalyzes respiratory ailments, compromised air quality, and cardiovascular stress—all factors implicated in the onset and exacerbation of cardiovascular diseases. Understanding the health implications of elevated energy consumption in water treatment processes, notably its impact on cardiovascular health, is paramount for adopting sustainable practices that safeguard both environmental sustainability and public health. Implementing energy-efficient technologies, renewable energy sources, and eco-friendly treatment strategies reduces the carbon footprint of water treatment operations and potentially mitigates the cardiovascular risks

associated with high energy demand. Integrated approaches that consider energy efficiency, water treatment technologies, and public health outcomes are essential for addressing these interconnected challenges.
Conclusion: understanding the relationship between energy consumption in water treatment processes and the prevalence of NCDs is essential for developing sustainable water management strategies that ensure access to safe water and promote public health by reducing environmental health risks associated with waterborne contaminants and energy consumption.

Key words: Environment, Water, treatment, Energy, Carbon footprint, Cardiovascular Diseases

## *Nanomedicine for the Diagnosis and Treatment of Thyroid Cancer*

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Aim and Background

Thyroid cancer (TC) is defined as an abnormal growth and proliferation of thyroid cells. TC treatment is encountered with challenges due to severe side effects, poor solubility and rapid clearance of common therapeutics. Hence, there is a critical need to use more effective treatment approaches to overcome the existing challenges. This study aims to investigate nanoparticles (NPs) for the diagnosis and therapy of thyroid cancer.

Methods

The related studies with the keywords “thyroid cancer,” and “nanomedicine,” were searched in PubMed, Science Direct, and Google Scholar. We searched 200 articles based on the topic; from this number, 50 articles were reviewed based on desired criteria.

Results and discussion

The application of NPs in TC treatment is widespread. Carbon NPs are a potent tool to improve lymph node identification during surgery. BioNanoFluid systems apply for thermal ablation of microcarcinoma. Gold nanoclusters, silica and CuS NPs are used for tumor detection. Silver NPs Decrease cell proliferation and increase apoptosis in the tumor cells. Nanobiosensors detect biomolecules such as calcitonin in human serum medium. Polymer, Protein and Lipid-based nanoparticles are commonly studied in the drug delivery approach. Moreover, Theranostic NPs and co-delivery systems give appropriate treatment strategies.

Conclusion

According to this study, the nano drug delivery systems as novel approaches are highly studied for the treatment and diagnosis of thyroid cancers by more targeted delivery to the tumor area.

Keywords: Nanoparticles, Target drug delivery systems, Thyroid cancer

## *Diagnosis and treatment gap for osteoporosis in the population aged 50 and above: Results from Iranian Multicenter Osteoporosis Study (IMOS) 2021-2022*

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Purpose

Given the escalating prevalence of osteoporosis, it is imperative to ensure prompt diagnosis of patients and initiation of treatment. This study aimed to evaluate the diagnosis and treatment gap of osteoporosis in the IMOS study.

Methods

The IMOS national study selected participants aged 50 years and above from urban and rural regions from eight provinces of Iran. In all participants, bone mineral density (BMD) was measured using a standardized, calibrated Hologic DXA device. The diagnosis gap, is defined as

the proportion of individuals with osteoporosis who have not been diagnosed before and are unaware about osteoporosis, and the treatment gap, is defined as the proportion of eligible patients not receiving prescribed medication. Osteoporosis treatment adherence is defined as patients consuming medications completely regularly.

Results

Among 1450 individuals, 431(29.7%) were diagnosed with osteoporosis. Notably, 88.4% of these diagnosed individuals were previously unaware of their condition. Also, from the 431 diagnosed patients with osteoporosis, 31 were undergoing treatment, indicating a substantial treatment gap of 92.8%. The results of the answer to the question "Do you have osteoporosis according to your doctor's diagnosis and are you taking medication" showed that 73 people out of 1450 people knew about their osteoporosis before entering the study and 42 patients started treatment. The equivalent of 57.5% were adherent to treatment.

Conclusion

Timely diagnosis, starting treatment and maintaining the continuity of treatment lead to reducing the important consequences of osteoporosis, including fracture and death. These include population screening for primary prevention, enhancing public awareness, and improving accessibility to services.

Keywords: Osteoporosis, Care gap, Health Services Accessibility, Iran

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## Prevalence of Vitamin D Deficiency among Iranian population Aged 50 Years and Over: Evidence from 4th Iranian Multi-center Osteoporosis Study (IMOS)

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Purpose

Vitamin D is crucial for bone health and a modifiable risk factor for osteoporosis. The aim of this study was estimating the prevalence of vitamin D deficiency in a nationally representative Iranian population of 50 years and older.

Methods

The IMOS study selected participants aged 50 and above from both urban and rural areas in Iran using a multistage, cluster random sampling method. Vitamin D levels in the serum were measured using Roche's electrochemiluminescence method, with values below 30 ng/mL indicating hypovitaminosis D. Data analysis was performed using survey methodology and Stata software.

Results

Among 1450 individuals included in the study, 54% were women and the mean (SD) age was 60.7 (8.0) years. The median and interquartile range (IQR) for serum vitamin D levels was 40.5 (26.8-55.8). A significant difference was noted in the median serum vitamin D levels between males (34.6) and females (44.6), ($P< 0.001$). The overall prevalence of vitamin D deficiency was 32.2% (29.4 – 35). The prevalence was higher in men, 39.3% (34.9 – 43.7), compared to women, 26.3% (22.9–30) ($P < 0.001$). This prevalence was 37.2% (31.7 – 42.9) and 30.4 % (27.3 – 33.7) in rural, and urban areas, respectively, ($P= 0.02$). The prevalence was highest, at 35.9%, in the 60–64-year age group, and lowest, at 29.9%, in the 55–59-year age group ($P=0.92$).

Conclusion

Vitamin D deficiency is prevalent in Iran, particularly among men and rural communities. Economically efficient interventions are required, especially for high-risk groups, to prevent osteoporosis and other musculoskeletal conditions.

Keywords: Vitamin D Deficiency, Bone, Osteoporosis, Iran

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## *The interaction between RORγt and Th17 cells: a crucial therapeutic strategy for Th17 mediated inflammatory diseases*

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Purpose

Gut microbiota has a significant role in the regulation of Th17 immune response. RORγt is an up-regulated transcription factor by the gut microbiome to initiate the differentiation of naive CD4+ T cells into mature Th17 cells. Although IL-17-producing Th17 cells are considered to be pathogenic in diseases such as inflammatory bowel disease, they play a crucial role in intestinal barrier integrity and homeostasis. The aim of the present study is to investigate the interaction between RORγt and Th17 cells in inflammatory responses.

Methods

The current article is exclusively a review and has been conducted based on comprehensive studies of various articles from 2000 to 2023 published on PubMed, et cet.

Results

RORγt-deficient T cells are unable to differentiate into Th17 cells, increased RORγt promotes the development of Th17 cells. The presence of RORγt is associated with brain proinflammatory response as a result of the connection between peripheral and central nervous system inflammation. These findings imply that inflammation in the CNS leads to the development of stress, anxiety, and depressive-like behavior which approves the undeniable connection between

the intestine and brain through the gut-brain axis. Thus, RORγt is a promising target to prevent the production and differentiation of Th17 cells and their inflammatory cytokines.

Conclusion

This study demonstrates that RORγt regulates the effector function of Th17 cells. Understanding the interaction between RORγt and Th17 cells is a crucial therapeutic strategy for Th17-mediated diseases. Future studies are needed on the relationship between this factor and gut microbiota immunity and the underlying mechanisms.

Keywords: Gut-brain axis – Gut microbiota – Th17 Cells - Inflammation – RORγt – IL-17

## *relationship between microbiome and chemotherapy resistance in pancreatic ductal carcinoma*

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INTRODUCTION:

The health of our digestive system is vital to the overall well-being of our body. The bacteria and microorganisms that reside in our gut play a critical role in ensuring healthy digestion, regulating our immune system, and protecting us against various diseases. Recent research has shown that the gut microbiome can have a significant impact on the efficacy of chemotherapy in treating pancreatic ductal adenocarcinoma (PDAC), one of the most aggressive and deadly forms of cancer. Unfortunately, chemotherapy often fails to be effective in treating PDAC due to the cancer's resistance to treatment. However, new evidence suggests that certain bacteria in the gut can prevent drugs from working correctly, reducing the effectiveness of chemotherapy. For instance, Gamma proteobacteria found in pancreatic tumors can break down the chemotherapy drug gemcitabine, making the tumor less responsive to the treatment. Moreover, the gut microbiome can influence the body's response to chemotherapy, which is a critical factor in determining the treatment's success. Certain bacteria can prevent the body from responding to the tumor, hindering its ability to fight back. Additionally, the gut microbiome can alter the environment around the tumor, making it difficult to deliver drugs. However, some types of bacteria can affect the structure, which could aid in drug delivery. By understanding the relationship between gut microbes and chemotherapy resistance in pancreatic cancer, we can develop new strategies to improve treatment outcomes. One such approach could be to manipulate the gut microbiome by administering probiotics, prebiotics, or fecal microbiota transplantation (FMT) from a healthy individual to enhance chemotherapy's effectiveness. This is a rapidly evolving area of research, and we still have much to learn. But if we can unlock the secrets of the gut microbiome, we could potentially save countless lives and make significant progress in the fight against pancreatic cancer.

METHODS:

Database: PubMed, Elsevier, Science

Keywords: Microbiota, Microbiome, Bacterial Resistance Chemotherapy, Endocrine Cancer, Control strategies, Cancer biology, Gut microbiota, Metabolites, Metabolomics, Pancreatic Cancer, Tumor Microenvironment, Bacterial Diversity in Different Cancers, Modulation of Oncogenic Signaling

Number of Articles: A total of 6 articles were identified.

Analysis :

After reading the full text and then extracting the findings from Each study, our team organized findings under three Competencies: knowledge, controlled trials, placebo Controlled

Study selection criteria: list specific criteria that will be used to include/exclude articles.

Articles were included if they were published between January 1, 2019 – December 2023

RESULTS:

“PDAC pancreatic ductal adenocarcinoma is characterized by a high incidence-to-death ratio due to late diagnosis and dominant chemoresistance. The chemoresistance in PDAC is attributed to several factors, including the genetic landscape, metabolic alterations, and a heterogeneous tumor microenvironment. This tumor microenvironment includes dense fibrosis, functionally distinct subclasses of cancer-associated fibroblasts, immune suppressive cells, and a variety of bacteria, all of which shape a specific tumor microbiome microenvironment. Bacteria have the capacity to metabolically transform and hence inactivate anticancer drugs. For instance, the efficacy of 10 out of 30 chemotherapeutics is inhibited by Escherichia coli. Drug catabolism by certain bacteria can lead to the inactivation of anticancer drugs, which can reduce their therapeutic effect. For instance, Escherichia coli has the ability to break down gemcitabine, a commonly used drug against pancreatic cancer, by expressing a cytidine deaminase enzyme. Some bacteria can also activate or inhibit specific signaling pathways that control cell survival, proliferation, apoptosis, autophagy, and inflammation, which can affect the efficacy of cancer drugs. For instance, Fusobacterium nucleatum can suppress the induction of autophagy and apoptosis by 5-fluorouracil and oxaliplatin, two other drugs used against pancreatic cancer, by modulating the NF-κB and PI3K/AKT pathways. Additionally, some bacteria can alter the tumor microenvironment by influencing the physical and chemical properties such as pH, oxygen level, extracellular matrix, immune response, and angiogenesis. For example, Helicobacter pylori can increase the acidity of the tumor microenvironment, which can impair the uptake and activity of weakly basic drugs like erlotinib, another drug used against pancreatic cancer. Furthermore, Gamma proteobacteria and Bacilli These bacteria are overrepresented in pancreatic cancer patients and have been shown to promote cancer drug resistance by interfering with the effect of gemcitabine.

Regarding the use and role of antibiotics in pancreatic cancer patients, it has been observed, studies have observed patients who have taken antibiotics According to a recent study, antibiotics may prevent bacteria-mediated chemoresistance in patients with metastatic pancreatic cancer who are treated with gemcitabine, a common drug for this disease. The study showed that

patients who received antibiotics had an improvement in overall survival and cancer-specific survival compared to those who did not.The possible mechanism of action of antibiotics is that they may modulate the bacteria that can degrade, inactivate, or interfere with the uptake and activity of gemcitabine in the tumor microenvironment. By reducing the bacterial load or altering the bacterial composition, antibiotics may enhance the efficacy of gemcitabine and overcome the resistance mechanisms.

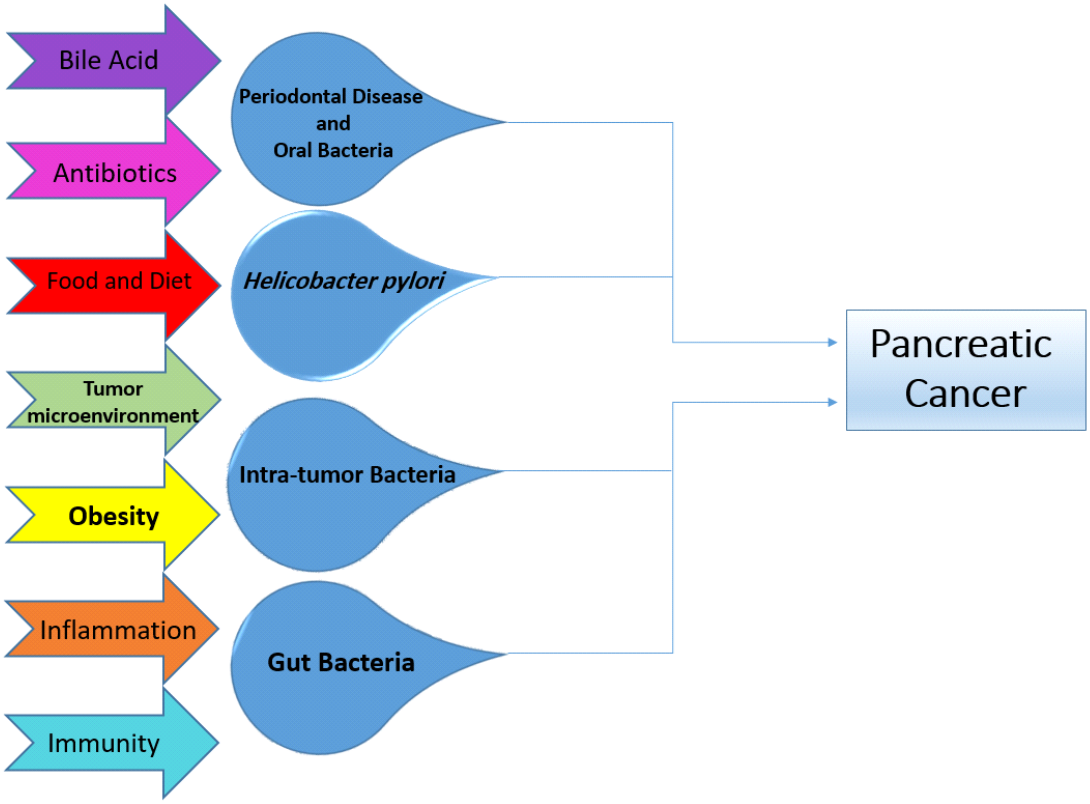


fig1: Factors involved in the spread and resistance to chemotherapy in pancreatic cancer.

DISCUSSION:

These studies show that a better understanding of how bacteria develop chemical resistance can significantly increase the effectiveness of current treatments. The ultimate goal is to overcome the chemoresistance of pancreatic cancer and improve clinical outcomes. It is important to note that the gut microbiota is a complex and dynamic system that can be affected by various factors such as diet, environment, and medication. Changes in the gut microbiota can have significant effects on health, including the effectiveness of medications. Therefore, understanding the relationship between gut microbiota and immunosuppressive drugs such as gemcitabine is essential as it can potentially improve treatment outcomes for transplant recipients. Gut microbiota can influence the effect of chemotherapy by modulating host immunity. Microbiota

can be easily modified through various strategies such as fecal microbiota transplantation, probiotics, and antibiotics. As we enter the era of personalized medicine, understanding the microbiota and its interactions with cancer is critical. Manipulating the gut microbiota to enhance cancer therapeutic responses could provide new insights into cancer treatment and pave the way for better outcomes.

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## *" Exploring the Impact of Adiponectin on Breast invasive carcinoma: A TCGA-based RNA Expression study and its Effect on Immune Cell Dynamics "*

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Introduction:

Adiponectin, an adipokine with diverse functionalities primarily secreted by adipocytes, is integral in modulating a variety of physiological and metabolic pathways. This investigation focuses on the prospective protective function of the adiponectin gene (ADIPOQ) against breast invasive carcinoma (BRCA). It entails a thorough exploration of RNA Expression data from The Cancer Genome Atlas (TCGA) to decode the intricate molecular interplay of ADIPOQ in BRCA context.

Methods:

Utilizing the TCGA database, we analyzed the ADIPOQ gene's expression across 1097 BRCA patient samples and 114 healthy controls, employing the UALCAN and TIMER2.0 platforms. The study also factored in TP53 mutation status and cancer stages for a comprehensive understanding of ADIPOQ's involvement in breast cancer dynamics.

Results:

Our analysis discerned a significantly downregulated of ADIPOQ expression in BRCA samples, contrasting with normal counterparts (Control Median TPM: 230.059 vs. Primary Tumor Median TPM: 1.503, $P < 0.0001$). The study further revealed significant inverse correlations of ADIPOQ with Myeloid-derived suppressor cells (rho = -0.30, adj P.value: 5.70E-21) and regulatory T cells (CIBERSORT, rho = -0.125, adj P.value: 7.45E-05), indicating its involvement in immune cell dynamics. Additionally, a substantial negative correlation was observed between ADIPOQ and the VEGFA gene (rho = -0.208, P.value: 2.89E-12), suggesting a potential modulatory role in tumor angiogenesis.

Conclusion:

This extensive analysis highlights the dysregulated expression of ADIPOQ in BRCA and its correlation with immune cell infiltration and genes related to tumor progression. These insights significantly contribute to our understanding of potential role of ADIPOQ in breast cancer.

Keywords: Adiponectin, Breast Neoplasms, Tumor Microenvironment, RNA, Neoplasm

## *Can serum calcium, phosphate and parathyroid hormone predict the volume of parathyroid adenoma?*

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*Introduction:* Preoperative biomarkers of patients with primary hyperparathyroidism (PHPT) including serum parathyroid hormone (PTH), calcium and phosphate levels may have correlated with the volume of parathyroid adenoma leading to PHPT.

*Methods:* In this retrospective study, the records of all PHPT patients who underwent solitary parathyroid adenoma surgery at Al-Zahra Teaching Hospital in Isfahan from 1389 to 1402 were reviewed. Demographic information such as age, gender and laboratory results including phosphate, corrected calcium (cCa), serum PTH and pathology report including adenoma volume and weight were recorded.

*Results:* Data of 157 patients were analyzed. There was a positive significant correlation between adenoma volume with serum cCa (r=0.49, P<0.001), PTH (r= 0.66, P<0.001) and adenoma weight with serum cCa (r=0.45, P<0.001) and PTH (r=0.55, P <0.001). There was no relationship between serum phosphate with adenoma volume (r= -0.08, P= 0.38) and adenoma weight (r=-0.015, P=0.9). After adjustment for confounding variables age, vitamin D and GFR the association between adenoma weight and volume with cCa and adenoma volume with PTH remained significant, also association between adenoma weight with phosphate was shown.

*Conclusion:* This study showed that there is a statistical correlation between the pre-operative blood levels of calcium and PTH with the postoperative adenoma weight and volume. This can

be used to choose the minimal invasive surgery to achieve minimal complications and the high rate of recover.

*Keyword*: Primary Hyperparathyroidism, Parathyroid Adenoma, Parathyroid Hormone.

## *Investigating the genotype frequency of rs141756339 CYP2D6 gene in the Iranian Population*

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**Abstract**

**Introduction:** Pharmacogenetics is the science of studying drugs and investigating the interaction between drugs and an individual's genotype. One of the important cytochrome P450 enzymes is CYP2D6, which is responsible for the metabolism of more than 25% of drugs. We aim to study the frequency of rs141756339 variants in the normal Iranian population.

**Materials and Methods:** Sequencing was done using the method Sanger Sequencing and frequency of rs141756339 polymorphism genotypes was investigated in the normal population.

**Results:** All 389 samples examined in the study showed the wild genotype with diplotype CYP2D6*1/*1, and heterozygous and homozygous mutant genotypes were not observed.

**Conclusion:** According to other studies conducted on the frequency of rs141756339 in different populations of the world, the frequency of this polymorphism in the Iranian population is similar to Ashkenazi and African populations.

**Key words**: Pharmacogenetics **,** CYP2D6 , rs141756339**.**

## *Investigating the genotype frequency of rs532668079CYP2D6 gene in the Iranian Population*

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**Abstract**

**Background**: CYP2D6 is one of the key pharmacogenes involved in the pharmacogenomics approach for several drugs. The present study aims to investigate the genotype frequency of rs532668079 CYP2D6 gene polymorphism in a normal Iranian population with different ethnicities

**Materials and Methods:** Genotyping was done for 389 Iranian volunteers with specific ethnicities by the Sanger sequencing method.

**Results**: The frequency of the reference allele is equal to C=1.000 and the frequency of alternative alleles is equal to T, G=0.000.

**Conclusion**: The frequency of the rs532668079 genotype in the Iranian population has similarities with European, African, and Asian populations.

**key words**: Pharmacogenetics**,** CYP2D6, rs532668079**.**

## *The probiotic-fermented tomato's effects in alleviating obesity: A Review*

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**Introduction**:

Obesity is a global health concern associated with various metabolic disorders. Probiotics, known for their beneficial effects on gut health, have gained attention as a potential strategy for managing obesity. Fermentation of tomato with probiotic strains offers a novel approach to enhance the nutritional value and bioactive properties of this widely consumed vegetable.

**Methods**:

This review summarizes the current scientific evidence regarding the impact of probiotic-fermented tomato on obesity-related parameters, including body weight, adiposity, lipid metabolism, and inflammation. Additionally, the mechanisms by which probiotic-fermented tomato exerts its beneficial effects on obesity are discussed, focusing on gut microbiota modulation, metabolic regulation, and immune system modulation.

**Results**:

The findings of the study demonstrated that probiotic-fermented tomato (FT) outperformed unfermented tomato in various aspects related to obesity reduction. FT showed significant improvements in reducing body weight gain and fat accumulation, as well as enhancing dyslipidemia and glucose homeostasis. Furthermore, FT exhibited positive effects in alleviating inflammation and regulating adipocytokine levels. Notably, the consumption of live probiotic-fermented tomato (LFT) was associated with beneficial changes in the diversity, composition, and structure of gut microbiota. LFT suppressed the growth of obesity-related genera such as Clostridium, Olsenella, and Mucispirillum, while promoting the growth of beneficial genera like Roseburia, Coprococcus, and Oscillospira. These changes were correlated with lower body weight, total cholesterol (TC), triglyceride (TG), and tumor necrosis factor-alpha (TNF-α) levels. Additionally, LFT positively influenced the levels of glycerophospholipids, sphingolipids, unsaturated fatty acids, and amino acids. Overall, these findings suggest that LFT holds potential as a functional food for alleviating obesity.

**Conclusion**;

In conclusion, the research on the effects of probiotic-fermented tomato in alleviating obesity has shown promising results. The probiotic properties of the fermented tomato have been found to positively impact gut health and metabolism, potentially leading to weight management and reduction of obesity-related symptoms. However, further studies are needed to fully understand the mechanisms behind these effects and to determine the optimal dosage and duration of

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consumption. Nonetheless, incorporating probiotic-fermented tomato into a balanced diet may be a beneficial strategy in the fight against obesity.

**Keywords**:

Obesity, Microbiota, Probiotics

## *The Role of Omics in Understanding and Combating Obesity*

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Introduction:
Obesity is a complex and multifactorial health issue that has reached epidemic proportions worldwide. Traditional approaches to studying obesity have provided valuable insights, but the advent of omics technologies has revolutionized our understanding of this condition. Omics, encompassing genomics, transcriptomics, proteomics, metabolomics, and other related disciplines, offers a comprehensive and holistic view of the molecular mechanisms underlying obesity.

Methods: In this review, we explore the contributions of omics in unraveling the intricate interplay between genetics, environment, and lifestyle factors in obesity development and progression.

Results:
Genomic studies have identified numerous genetic variants associated with obesity susceptibility. Through genome-wide association studies (GWAS), researchers have discovered loci and genes that influence body mass index (BMI), adiposity, and related metabolic traits. These findings have shed light on the genetic basis of obesity and provided potential targets for therapeutic interventions. Additionally, epigenetic modifications, such as DNA methylation and histone modifications, have been implicated in obesity-related gene regulation, further expanding our understanding of the molecular mechanisms involved.
Transcriptomic studies have revealed dysregulated gene expression patterns in adipose tissue, liver, muscle, and other relevant tissues in obesity. These alterations provide insights into the molecular pathways involved in adipogenesis, lipid metabolism, inflammation, and insulin resistance. Integration of transcriptomic and proteomic data has facilitated the identification of key molecular players and potential therapeutic targets. Metabolomic studies have highlighted disruptions in lipid metabolism, mitochondrial dysfunction, and alterations in gut microbiota composition in obesity. These findings have implications for understanding obesity-related comorbidities and developing personalized interventions.

Conclusion:
Omics technologies have significantly advanced our understanding of the molecular mechanisms underlying obesity. Integrating data from genomics, transcriptomics, proteomics, and

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metabolomics has provided a comprehensive view of the complex interactions between genetic, environmental, and lifestyle factors in obesity development. These insights hold promise for the development of targeted interventions, personalized treatments, and preventive strategies to combat obesity and its associated health complications. Continued advancements in omics technologies and data integration approaches will further enhance our understanding of obesity and pave the way for precision medicine approaches in its management.

Keywords: Obesity, Omics, Precision medicine

## *The effects and mechanisms of dietary plants on gut microbiota and obesity*

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**Introduction**:

Obesity has become a global health concern, with its prevalence steadily increasing over the years. While various factors contribute to obesity, recent research has shed light on the role of gut microbiota and its interaction with dietary plants in influencing body weight. This article aims to explore the effects and mechanisms behind the relationship between dietary plants, gut microbiota, and obesity.

**Methods**:

This review provides a summary and classification of the gut microbiota associated with obesity, distinguishing between obesogenic and anti-obesity categories. Additionally, it explores the effects of certain dietary plants that have the ability to modulate the gut microbiota and discusses the mechanisms by which their bioactive components act.

**Results**:

The gut microbiota refers to the trillions of microorganisms residing in our gastrointestinal tract. These microorganisms play a crucial role in maintaining our overall health, including metabolism and immune function. Recent studies have shown that alterations in the composition and diversity of gut microbiota are associated with obesity.Dietary plants, particularly those rich in fiber, have been found to have a significant impact on gut microbiota composition. Fiber acts as a prebiotic, providing nourishment to beneficial bacteria in the gut. This leads to an increase in the production of short-chain fatty acids (SCFAs), which have been linked to reduced obesity risk. Mechanisms behind the relations include 1.Increased satiety: Dietary plants, such as fruits, vegetables, and whole grains, are often low in calories but high in fiber. These foods promote satiety, reducing the overall calorie intake and preventing overeating. 2. Regulation of energy metabolism: Gut microbiota can influence energy metabolism by breaking down complex carbohydrates into SCFAs. SCFAs, particularly butyrate, have been shown to enhance energy expenditure and fat oxidation, thereby reducing obesity risk. 3. Inflammation and metabolic disorders: Imbalances in gut microbiota can lead to chronic low-grade inflammation, which is associated with obesity and metabolic disorders. Dietary plants, through their impact on gut microbiota, can help reduce inflammation and improve metabolic health . 4. Gut barrier function: A healthy gut barrier prevents the translocation of harmful substances into the bloodstream. Dietary plants, by promoting a diverse and balanced gut microbiota, contribute to maintaining gut barrier integrity, reducing the risk of metabolic endotoxemia and obesity-related complications.

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**Conclusion**:

The relationship between dietary plants, gut microbiota, and obesity is a complex and fascinating area of research. Evidence suggests that dietary plants, particularly those rich in fiber, can positively influence gut microbiota composition, leading to various mechanisms that reduce the risk of obesity. Incorporating a diverse range of dietary plants into our meals can be an effective strategy for promoting a healthy gut microbiota and preventing obesity. However, further research is needed to fully understand the intricate mechanisms involved and to develop personalized dietary recommendations for individuals at risk of obesity.

**Key words**: Plant, Obesity, Microbiota