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DIETARY PATTERNS AND OBESITY: A COMPARATIVE REVIEW OF WESTERN MEDITERRANEAN, PLANT-BASED, AND LOW-CARB DIETS

Annotation

Obesity is a global outbreak associated with different dietary patterns. As the surge in the number of obese people grows, understanding the role of diet is crucial for developing nutritional strategies for the prevention of obesity. Western, Mediterranean, plant-based, and low-carb diets were examined in this article to assess their impact on obesity-related outcomes. Studies reflecting these diets are reviewed, and a comparison table is provided to determine how each diet prevents or contributes to obesity. Measuring body mass index (BMI), waist circumference, and fat percentage are key factors in determining obesity. The findings show that while Mediterranean and plant-based diets present protective effects against obesity, Western diet is associated with weight gain and metabolic diseases. Although a low-carbohydrate diet is effective for weight loss in the short term, it presents unpredictable long-term results. However, further research is needed to evaluate long-term adherence in metabolic outcomes.

Key words: Obesity, body mass index (BMI), waist circumference, dietary patterns, Western, Mediterranean, plant-based, low-carbohydrate diets.

ПИЩЕВЫЕ МОДЕЛИ И ОЖИРЕНИЕ: СРАВНИТЕЛЬНЫЙ ОБЗОР ЗАПАДНОЙ, СРЕДИЗЕМНОМОРСКОЙ, РАСТИТЕЛЬНОЙ И НИЗКОУГЛЕВОДНОЙ ДИЕТ

Аннотация

Ожирение представляет собой глобальную проблему, связанную с различными типами питания. По мере роста числа людей с избыточным весом становится крайне важным понимание роли рациона питания для разработки эффективных стратегий профилактики ожирения. В данной статье рассматриваются западная, средиземноморская, растительная и низкоуглеводная диеты с целью оценки их влияния на показатели, связанные с ожирением. Проанализированы исследования, отражающие особенности этих диет, и представлена сравнительная таблица, показывающая, насколько каждая из них способствует профилактике или развитию ожирения. Оценка индекса массы тела (ИМТ), окружности талии и процента жира являются ключевыми факторами в диагностике ожирения. Полученные данные показывают, что средиземноморская и растительная диеты обладают защитным эффектом против ожирения, тогда как западная диета ассоциируется с набором веса и метаболическими заболеваниями. Хотя низкоуглеводная диета эффективна для снижения массы тела в краткосрочной перспективе, её долгосрочные результаты остаются непредсказуемыми. Однако необходимы дополнительные исследования для оценки соблюдения данной диеты в долгосрочной перспективе и её влияния на метаболические показатели.

Ключевые слова: Ожирение, индекс массы тела (ИМТ), окружность талии, особенности питания, западная, средиземноморская, растительная, низкоуглеводная диета.

PARHEZLAR VA SEMIZLIK: G'ARBIY, O'RTA YERDENGIZI O'SIMLIKLARGA ASOSLANGAN VA KARBONGIDRATLARI KAM BO'LGAN PARHEZLARNING TAQQOSLOVCHI TAHLILI

Annotatsiya

Semizlik – bu dunyo bo'yicha keng tarqalgan muammo bo'lib, turli xil ovqatlanish odatlari bilan bog'liqdir. Semizlikka chalingan odamlar sonining ortib borishi bilan, parhezning rolini tushunish semizlikning oldini olish uchun samarali ovqatlanish strategiyalarini ishlab chiqishda muhim ahamiyatga ega. Ushbu maqolada G'arbiy, O'rta Yer dengizi, o'simliklarga asoslangan va kam uglevodli parhezlar ko'rib chiqilib, ularning semizlik bilan bog'liq natijalarga ta'siri baholangan. Ushbu parhezlarni yorituvchi tadqiqotlar ko'rib chiqilgan va har bir parhez semizlikni qanday oldini olishi yoki unga qanday hissa qo'shishi haqida taqqoslovchi jadval keltirilgan. Semizlikni aniqlashda tana massasi indeksi (TMI), bel atrofi va yog' foizi asosiy ko'rsatkichlar hisoblanadi. Tadqiqot natijalari shuni ko'rsatadiki, O'rta Yer dengizi va o'simliklarga asoslangan parhezlar semizlikka qarshi himoya ta'siriga ega bo'lsa, G'arbiy parhez esa tana vaznining ortishi va moddalar almashinuvi kasalliklari bilan bog'liq. Kam uglevodli parhez qisqa muddatda vazn yo'qotishda samarali bo'lishiga qaramay, uning uzoq muddatli ta'siri oldindan aytib bo'lmaydi. Shuningdek, moddalar almashinuvi bilan bog'liq uzoq muddatli natijalarni baholash uchun qo'shimcha tadqiqotlar zarur.

Kalit so'zlar: Semizlik, tana massasi indeksi (TMI), bel atrofi, ovqatlanish odatlari, G'arbiy, O'rta Yer dengizi, o'simliklarga asoslangan, kam uglevodli parhezlar.

Introduction. Obesity is a critical public health concern, causing cardiovascular diseases (CVD), metabolic disorders, type 2 diabetes, and others, which eventually might lead to death [8]. While genetic and lifestyle factors contribute to obesity, diet composition remains one of the most influential and alterable factors [5]. Different diet patterns have varying effects on body weight and metabolism, depending on macronutrient distribution, food quality, and compliance. The current review focuses on four primary dietary patterns, Western, Mediterranean, plant-based, and low-carb diets, and their association with obesity. The main composition of the Western diet is mostly unhealthy and high in energy products such as refined sugar, snack foods, processed foods, saturated fats, high-fructose beverages, and others, which are all proven to lead to excess weight [1]. This type of diet is especially prevalent in developed and developing countries and causes obesity-related diseases not only among adults but among children as well [8]. The Mediterranean diet emphasizes whole foods, healthy fats, and balanced mixtures of macronutrients, which often leads to improved weight management [6]. The primary source of a plant-based diet, commonly known as a vegetarian diet, is fruits, vegetables, mushrooms, and legumes, which are high in fiber and low in calories leads to reduced body mass index (BMI) and fat composition [9]. The low-carbohydrate dietary approach also promotes weight loss; though long-term adherence remains a concern [3]. By examining and comparing recent scientific studies, this article highlights the impact, including the benefits and limitations of each dietary approach on weight management and long-term health.

Western Diet and Obesity

In economically advanced countries, obesity has become prevalent during the last several years, and The Western diet is one of the main contributors to it [4]. The consumption of high-energy products, sugary drinks, packaged snacks, processed foods such as frozen meals, cookies, chicken nuggets, hot dogs, and both saturated and trans fats is the main composition of this diet. This composition lacks fiber, minerals, vitamins, antioxidants, and other healthy nutrients while being excess in energy portions, sugar, and salt [1]. Poor nutrition quality not only leads people to gain excess weight but also increases the risk of heart disease, diabetes, metabolic disorders, cancer, and even death [10]. Studies have shown a strong link between this diet and obesity in rat models [4]. A review by Leigh, Kendig, and Morris (2019) found that the Western diet demonstrated high body mass index, fat mass composition, and other obesity-related outcomes in rats. Understanding this type of rodent model is essential for tackling obesity in humans.

Mediterranean Diet and Obesity

The Mediterranean diet's primary composition is high-quality foods that are rich in antioxidants, minerals, vitamins, and fiber, such as herbs, grains, extra virgin olive oil, fruits, vegetables, legumes, and nuts [2]. In this traditional diet, while fish and seafood are consumed moderately, sweetened, processed, unpackaged foods and other unhealthy, poor, nutrient-quality foods are consumed minimally [6]. Research by Dominguez and colleagues (2023) demonstrated that adherence to the Mediterranean diet led to reduced not only weight but also the risk of cardiovascular diseases. Compared to other dietary approaches, such as low-carb, low-fat diets, the Mediterranean diet leads to greater weight loss and long-term adherence [2]. It is proven to be the most effective preventative method for obesity as it provides adequate energy intake consisting of healthy and nutritious fats and carbohydrates.

Plant-Based Diet and Obesity

A low-energy-density plant-based diet is defined as eliminating all meats or certain types. This dietary pattern includes various kinds, from vegan to semi-vegetarian and others [9]. Despite the difference in the composition of the main ingredients, many studies indicate that all plant-based diets lead to significant weight loss, which is essential for reducing obesity risk [7,9]. A plant-based diet is not focused on lowering portion size but on calories. People consume lower-calorie foods, which mainly consist of water, giving the same proportion but fewer calories. These are plant origins such as vegetables, fruits, mushrooms, grains, etc. [7]. According to research by Elisabeth Tran, Hanna Fjeldheim Dale, Caroline Jensen, and Gülen Arslan Lied (2020), a plant-based diet may not only have beneficial health effects on body mass index and fat proportion but also reduce the risk of cardiovascular disease type 2 diabetes [9]. Hence, even though the effects of the different plant-based interventions differ depending on the specific diet type, they all lead to reduced body mass by restricting fat intake followed by decreased energy intake [9].

Low-Carbohydrate Diet and Obesity

There have been several studies regarding low and high-carb diets and their comparison with low-fat diets. While research by Santangelo, G., & Minerva, M. (2021) indicated that low-carbohydrate diets are more effective than a low-fat diet in adolescents who suffer from obesity, Foster, G. D. et al. (2003) found that even though this diet is associated with a greater weight loss in the short term, its long term efficiency remains a concern [3,11]. Individuals on this type of diet can easily lose weight as it restricts carbohydrate intake while promoting a greater consumption of fat and protein [11].

A comparison table of four diets:

	Dietary pattern:	Composition:	Obesity-Related Outcomes:	Metabolic Outcomes:	Ref:
1	The Western diet	High intake of processed foods, red meat, refined sugars. Low consumption of fruits, vegetables, and whole grains.	Highly contributes to obesity, particularly abdominal obesity.	The Western diet adversely affects insulin sensitivity, increases inflammation, and contributes to metabolic disorders.	[1]
2	The Mediterranean diet	High intake of fruits, vegetables, whole grains, legumes, olive oil, and fish, with moderate consumption of dairy products.	Associated with reductions in visceral fat and waist circumference. Promotes weight loss, particularly in individuals with obesity	Improves lipid profiles (lowering triglycerides and increasing HDL cholesterol) and enhances insulin sensitivity.	[6]
3	Plant-based diet	High intake of plant foods, including fruits, vegetables, legumes, nuts, seeds, and whole grains. Excludes or minimizes animal products.	Linked to reduced body fat and lower BMI. Effective in reducing weight and preventing obesity.	Improves metabolic markers, including insulin sensitivity, cholesterol levels, and blood pressure.	[7]
4	Low-carb diet	Low intake of carbohydrates, with a higher intake of fats and moderate protein.	Greater weight loss in adolescents with obesity when compared to low-fat diets. Long-term adherence may be challenging for some people.	Improvements in insulin sensitivity and reduction in triglyceride levels.	[11]

Discussion. Obesity trend has been increasing over the years, and it is causing not only morbidities, such as diabetes, heart disease, cancer, and depression, but also mortality [8]. Dietary intervention is not the only way against obesity; there are others, such as plastic or medical surgeries, pharmaceutical medications, or lifestyle behavior and regimen changes as well [11].

Still, managing one's diet is the easiest, safest, and most alterable way. Each reviewed diet has a different composition and outcome. The most harmful type of diet is the Western diet, as it is poor in nutrients while being high in calories.

In contrast, the traditional Mediterranean and plant-oriented diets are proven to be effective for obesity prevention, especially the former one [6]. The Mediterranean diet is rich in fibers, vitamins, antioxidants, and minerals, which provide sufficient energy and satiety [2]. Low-carb diets also help reduce body weight, as high-carb foods such as white bread, sweets, and sugary drinks easily cause obesity. While there is a short-term effect of this diet, its further effects disappear [2].

Another notable point is dietary adherence. While balanced diets such as the Mediterranean and vegetarian diets exhibit a higher adherence rate, which is essential for long-term health, poor compliance is associated with diets low in sugar [3]. Overall, obesity can be caused by various aspects, including medical conditions, psychological and socio-economic status, endocrine disorders, drugs, physical inactivity, sleep disturbance, and chemicals, and excessive caloric intake make up the most essential contributors to it [5]. Hence, more diverse and specific studies are needed to assess each dietary intervention's effectiveness on obesity management.

Conclusion. While various aspects can cause obesity, diet is considered a primary contributing factor. Four compared diets demonstrated distinct patterns.

Overall, the Western diet is strongly linked to excess overweight, while diets that are rich in fiber, antioxidants, minerals, and vitamins, mostly plant-oriented, low-energy, but high in quality, such as Mediterranean and plant-based ones, are effective for obesity prevention. Even though low-carbohydrate diets lead to significant short-term weight loss, their further adherence should be studied thoroughly.

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