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Review

A Narrative Review of the Mediterranean Lifestyle and Its Role on Obesity Prevention and Management

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Abstract: The Mediterranean lifestyle, encompassing key elements such as the Mediterranean diet, regular physical activity, social engagement, sleep-enhancing habits, sustainable food practices (including reducing food waste and opting for seasonal and local products), proximity to nature, and a focus on slow living, has garnered increasing interest for its potential in obesity prevention and management. This narrative review examines how these lifestyle characteristics influence body weight regulation, metabolic health, and obesity-related outcomes. A thorough literature search was conducted to synthesize findings from epidemiological studies, clinical trials, and mechanistic research. Evidence suggests that adherence to the Mediterranean diet is linked to lower obesity rates, improved metabolic markers, and reduced risk of weight gain. Key components contributing to these effects include high fiber intake, healthy fats from olive oil and nuts, and a balanced macronutrient profile that promotes satiety and reduces inflammation. Furthermore, lifestyle practices such as regular physical activity, strong social connections, and sleep-enhancing habits may further support weight management. Despite consistently favorable findings in observational studies, intervention trials reveal variability in individual responses, highlighting the need for personalized approaches. Future research should explore strategies to enhance adherence and investigate the interactions between diet, physical activity, and psychosocial factors in obesity prevention.

Keywords: mediterranean diet; mediterranean lifestyle; obesity prevention; sustainable food

1. Introduction

The Mediterranean lifestyle, a holistic approach to health and well-being, is centered on several key pillars that have been shown to contribute to the prevention and management of obesity. These pillars include a healthy and balanced diet, regular physical activity, strong social interaction, connection to nature, sustainability, and healthy sleep habits. Together, they form a comprehensive way of living that promotes a balanced and healthy lifestyle, with a focus on overall well-being and the maintenance of a healthy body weight. At the core of the Mediterranean lifestyle is the Mediterranean diet, which is rich in fruits, vegetables, whole grains, legumes, nuts, and olive oil, with moderate consumption of fish and poultry. This diet, which emphasizes the consumption of fresh, locally grown produce and healthy fats, is associated with various health benefits, including weight management, improved cardiovascular health, and a reduced risk of chronic diseases [1].

Regular physical activity is another key pillar of the Mediterranean lifestyle. Engaging in moderate, daily physical exercise, such as walking, cycling, or gardening, is common in Mediterranean communities. This not only helps in weight regulation but also improves overall health, including better cardiovascular function, enhanced mood, and increased life expectancy. Physical activity, combined with a diet rich in nutrients, plays a vital role in maintaining a healthy weight and preventing obesity [2].

The Mediterranean diet is not just a healthy nutritional way; it also promotes mindful eating practices, often with family and friends, which enhances the social aspect of meals and fosters stronger social ties. The Mediterranean lifestyle also emphasizes the importance of social interaction.

In many Mediterranean cultures, socializing is an integral part of daily life, with meals often shared with family, friends, and neighbors. This strong sense of community and social support can contribute to emotional well-being, reduce stress, and improve mental health, all of which are crucial for the prevention of obesity and related health conditions [3].

Furthermore, living near nature is another fundamental aspect of the Mediterranean way of life. Many Mediterranean communities have easy access to outdoor spaces, and spending time in nature is encouraged. Whether through leisurely walks in the countryside or swimming in the sea, this connection to the natural environment supports physical and mental health and promotes a lifestyle that is more active and less sedentary [4].

Sustainability also plays a significant role in the Mediterranean lifestyle, which often prioritizes local, seasonal, and organic food sources, promoting environmentally friendly practices. The Mediterranean way of living advocates for a balanced relationship with nature, both in terms of food consumption and environmental impact, making it a model for sustainable living and healthy eating [5].

Lastly, healthy sleep habits are a crucial pillar of the Mediterranean lifestyle. Adequate sleep, often following the natural rhythm of day and night, is essential for maintaining good health. Proper rest supports metabolic function, emotional well-being, and cognitive performance, contributing to the overall success of the lifestyle in managing body weight and promoting long-term health [6,7].

All these pillars form the foundation of the Mediterranean lifestyle, which has proven to be a protective factor against obesity. By promoting healthy eating, regular physical activity, strong social bonds, sustainability, and good sleep practices, this lifestyle helps individuals maintain a healthy weight and reduce the risk of developing obesity and other chronic diseases [8].

The purpose of this review article is to explore the key factors of the Mediterranean lifestyle that influence obesity prevention and management, and to examine the individual variations in response to these factors, highlighting the need for personalized strategies to combat obesity.

2. Materials and Methods

This narrative review synthesizes and analyzes findings from existing studies on the Mediterranean lifestyle and its role in obesity prevention and management. A comprehensive search of relevant literature was conducted across multiple databases, including PubMed, Scopus, and Google Scholar, using key terms such as “Mediterranean Lifestyle AND obesity,” “Mediterranean diet AND obesity,” “sociality AND obesity,” “sustainability (or Food waste or Seasonal-local products) AND obesity,” “proximity to nature AND obesity,” “physical activity AND obesity,” and “sleep patterns AND obesity.” Studies published in English, between 2000 and 2024, were included. Articles included in this review were selected based on their relevance to the research topic, quality of methodology, and contribution to the field [9,10].

The review focused on epidemiological studies, clinical trials, and mechanistic research that examined the effects of Mediterranean dietary patterns, physical activity, sleep habits, and social engagement on obesity prevention and management. The Mediterranean diet, as part of the broader Mediterranean lifestyle, has been extensively studied for its effects on weight regulation and obesity prevention [11]. Key components such as the consumption of fruits, vegetables, whole grains, olive oil, and fish have been shown to reduce the risk of obesity and chronic diseases associated with it [12]. Moreover, the combination of the Mediterranean diet with regular physical activity is believed to be particularly effective in managing obesity [13]. Physical activity, ranging from daily walking to structured exercise programs, has been found to enhance the beneficial effects of the Mediterranean diet on weight regulation [14].

Social engagement and interaction, a crucial aspect of the Mediterranean lifestyle, also plays an important role in prevention of obesity. Sociality, or social support, has been shown to be a significant factor in managing obesity, with positive social interactions reducing stress and promoting healthier lifestyles [15]. The Mediterranean way of life, which encourages shared meals with family and

friends, strengthens these social bonds and improves overall well-being, which is beneficial for weight management [16].

Sustainability, including practices such as food waste reduction and the promotion of seasonal and local products, is another component of the Mediterranean lifestyle that may influence obesity. Sustainable food choices, such as consuming locally sourced and seasonal foods, are linked to healthier diets and a lower risk of obesity [17]. Moreover, reducing food waste is an important factor in promoting a healthier, more sustainable food system, which can positively impact weight management and reduce obesity rates [18].

The Mediterranean lifestyle's emphasis on proximity to nature and the outdoors has also been recognized for its beneficial effects on obesity prevention. Time spent in nature, whether through activities like walking, swimming, or gardening, has been shown to reduce stress levels, promote physical activity, and support overall health, contributing to better weight regulation [19]. Studies indicate that living in close proximity to green spaces or natural environments may encourage individuals to be more active, thus preventing sedentary behaviors linked to obesity [20].

Furthermore, healthy sleep patterns, another crucial pillar of the Mediterranean lifestyle, have been found to influence obesity management. Sleep deprivation and irregular sleep patterns have been associated with weight gain and obesity, while adequate, quality sleep promotes metabolic function and helps regulate appetite [21]. The Mediterranean approach to sleep, which often aligns with natural circadian rhythms, may play a role in supporting healthy sleep habits that contribute to better weight regulation [22].

The data from these studies were analyzed and summarized to identify trends and draw conclusions about the relationship between the Mediterranean lifestyle and body weight regulation. For studies that reported large datasets, the location of the data deposit and the corresponding accession numbers were recorded when available. Where applicable, data was accessed from publicly available databases to ensure transparency and replicability. No new experimental methods or protocols were introduced, as this is a narrative review based on previously published studies. All referenced studies were appropriately cited, and relevant ethical approval codes for clinical trials and intervention studies involving humans or animals were noted in the original publications [23]. Finally, any data or materials used from other sources were appropriately cited to ensure clarity and adherence to research integrity standards [24].

3. Results

3.1. Mediterranean Diet and Obesity Prevention

3.1.1. Role of the Mediterranean Diet in Obesity Regulation

The Mediterranean diet has been widely recognized for its potential in preventing and managing obesity. This diet emphasizes plant-based foods, healthy fats (particularly olive oil), moderate intake of fish, and low consumption of red meat and processed foods. Numerous studies have shown that adherence to the Mediterranean diet can help prevent obesity and reduce the risk of obesity-related diseases. The Mediterranean diet, rich in antioxidants and anti-inflammatory compounds from fruits, vegetables, and olive oil, has been linked to improved weight regulation and reduced abdominal obesity. This connection is primarily due to the high levels of polyphenols and unsaturated fats found in olive oil and other plant-based components of the diet, which help reduce adiposity through mechanisms like inflammation reduction and enhanced insulin sensitivity [24].

The diet's high fiber content supports weight loss by increasing satiety and reducing overall calorie consumption. Research indicates that fiber-rich foods from legumes, vegetables, and whole grains not only help maintain healthy digestion but also contribute to the reduction of caloric intake by enhancing feelings of fullness and reducing appetite [25]. Olive oil, a central component of the Mediterranean diet, is linked to improved body fat distribution and reduced visceral fat. A study found that individuals consuming a Mediterranean diet enriched with olive oil showed significant reductions in visceral fat, which is a key contributor to metabolic diseases such as Type 2 diabetes and cardiovascular disease [25,26]. Studies have confirmed that individuals adhering to the

Mediterranean diet typically experience a healthier weight profile, improved metabolic function, and reduced risk of obesity compared to individuals following other dietary patterns [27].

3.2. Physical Activity and Obesity Management

Physical activity is another essential component of the Mediterranean lifestyle that plays a significant role in preventing and managing obesity. The lifestyle encourages regular physical activity such as walking, cycling, gardening, and social events involving movement. A combination of a Mediterranean diet and regular physical activity results in improved weight management and a reduced risk of obesity. Studies suggest that both dietary adherence and physical activity are crucial for achieving optimal weight control, especially when combined. Studies also suggest that the Mediterranean diet, along with moderate physical activity, improves fat metabolism, reduces the risk of chronic diseases, and contributes to maintaining a healthy weight. According to a study, individuals who combined diet with physical activity had better control over their body composition, with reduced visceral fat and increased lean body mass [28]. The Mediterranean approach to physical activity encourages activities that improve cardiovascular health and enhance muscle mass, supporting healthy body composition and weight management. Regular low-to-moderate-intensity exercise, as promoted by Mediterranean culture, improves overall physical fitness, supports fat oxidation, and reduces the risk of metabolic syndrome [29].

3.3. Sleep Habits and Social Engagement

In addition to diet and physical activity, the Mediterranean lifestyle places significant emphasis on sleep habits and social engagement, both of which influence weight regulation.

3.3.1. Sleep and Obesity

Sleep plays a key role in regulating appetite and body weight. Studies suggest that inadequate or poor-quality sleep can lead to increased appetite, particularly for high-calorie foods, thus promoting weight gain. In the context of the Mediterranean lifestyle, adequate sleep is prioritized, which may help mitigate obesity risks. Poor sleep quality and insufficient sleep are associated with a higher risk of obesity and metabolic dysfunction. Chronic sleep deprivation disrupts the balance of hunger-regulating hormones, such as ghrelin and leptin, which can lead to overeating and weight gain. A study demonstrated that inadequate sleep significantly increased the likelihood of obesity, particularly abdominal fat accumulation [30]. Studies have shown that people who follow Mediterranean sleep habits (prioritizing sufficient and restful sleep) have a better body mass index (BMI) and reduced weight gain risk. The Mediterranean lifestyle places strong emphasis on relaxation and sleep quality, which is positively correlated with weight control and metabolic health [31].

3.3.2. Social Engagement and Its Impact on Obesity

The Mediterranean lifestyle emphasizes strong family bonds and social interactions, which contribute to emotional well-being. Positive social support systems are linked to healthier eating behaviors and a lower likelihood of obesity. Social engagement and support are associated with healthier lifestyle behaviors, including improved dietary patterns and increased physical activity, both of which contribute to weight management. Mediterranean culture's emphasis on communal eating and social interactions encourages the intake of nutrient-dense foods and active participation in physical activities, which help maintain a healthy weight and prevent obesity [32]. Strong social ties and regular family meals, common in Mediterranean cultures, promote healthier eating patterns and discourage the adoption of unhealthy, sedentary behaviors. Studies have found that individuals who regularly engage in shared meals are less likely to experience weight gain or obesity, as they tend to have better control over their food choices and maintain a balanced lifestyle [33].

Table 1 summarizes the Key Studies on Mediterranean Lifestyle and Obesity Prevention.

Table 1. Summary of Key Studies on Mediterranean Lifestyle and Obesity Prevention.

Study	Year	Participants	Main Findings	Type of Study
UK Biobank Study	2020	110,799 individuals (aged 40-75)	Higher adherence to the Mediterranean lifestyle was associated with a 29% reduced risk of all-cause mortality and a 28% reduced risk of cancer.	Cohort Study
University Hospital of Barcelona Study	2007	Not specified	The Mediterranean diet was linked to a reduced incidence of obesity and improved metabolic profile	Observational Study
Brigham and Women's Hospital Study	2020	10,670 women	The Mediterranean diet was associated with improved health and well-being in older ages.	Cohort Study
PREDIMED Study	2013	7,447 individuals (aged 55-80)	The Mediterranean diet, particularly when combined with extra-virgin olive oil or nuts, significantly reduced the incidence of cardiovascular diseases and obesity.	Randomized Controlled Trial (RCT)
Nurses' Health Study	2003	74,000 women	A high adherence to the Mediterranean diet was associated with lower risk of cardiovascular disease and better overall health.	Cohort Study
Lyon Diet Heart Study	1999	1,000 individuals (aged 55-75)	The Mediterranean diet significantly reduced the recurrence of heart disease in individual's post-myocardial infarction.	Randomized Controlled Trial (RCT)
Mediterranean Diet and Cardiovascular Health Study	2017	1,500 individuals (aged 40-60)	The Mediterranean diet improved heart health and	Cohort Study

			blood pressure, contributing to weight loss and obesity prevention.	
EPIC Study	2014	500,000 individuals (aged 25-70)	The Mediterranean diet was found to be protective against obesity, diabetes, and other chronic diseases, including a significant reduction in the risk of type 2 diabetes.	Prospective Cohort Study

3.4. Sustainability and the Mediterranean Diet

Sustainability within the Mediterranean lifestyle involves a focus on local, seasonal foods, reduced food waste, and a smaller environmental footprint. This diet emphasizes plant-based foods, with an emphasis on vegetables, fruits, legumes, whole grains, and nuts, along with modest portions of animal products. These practices not only benefit health but also help in addressing issues like environmental degradation and the overconsumption of processed foods that contribute to obesity. The Mediterranean diet encourages a reduction in food waste by focusing on seasonal and locally sourced ingredients. By using produce at its peak season, this diet reduces the environmental costs associated with food production, transportation, and storage. Research has shown that diets based on local, seasonal products have a smaller carbon footprint compared to those relying on processed foods or non-seasonal products. This environmental consideration is tied to promoting more natural, unprocessed foods, which are also crucial for maintaining a healthy weight and reducing the risk of obesity [34]. Supporting Local Agriculture and Sustainable Practices: In the Mediterranean, there is a strong tradition of supporting local farmers and markets. Local produce tends to be fresher and more nutrient-dense, and when it is consumed in season, it naturally reduces the need for high-calorie, processed foods. By encouraging the consumption of seasonal, local fruits and vegetables, the Mediterranean diet helps people access nutrient-dense foods that are low in calories and rich in fiber and antioxidants, thereby supporting weight control and metabolic health [35].

3.5. Food Waste and its Impact on Obesity Prevention

Food waste is a major environmental and economic issue globally, and it also contributes to the excess consumption of food. The Mediterranean diet encourages the use of all parts of plants and animals to minimize food waste, fostering a sustainable and responsible approach to food consumption. The Mediterranean diet promotes the use of whole foods, which minimizes food waste by encouraging the consumption of leftovers or creatively using parts of plants (e.g., vegetable tops, stems, and leaves) and animal products (e.g., using bone broths, offals). These practices contribute to more sustainable eating habits while simultaneously promoting healthier food choices, as they encourage less processed food and reduce caloric intake that often comes from high-calorie convenience foods [36]. One way that food waste reduction may influence obesity prevention is through mindfulness about food choices and portion sizes. The Mediterranean culture emphasizes shared meals and careful meal planning, which can reduce food waste and prevent overeating. This approach fosters a more conscious relationship with food, emphasizing quality over quantity, and encourages people to eat according to their hunger rather than overeating or relying on unhealthy snacks and processed foods [37].

3.6. Seasonal and Local Products and Obesity Prevention

Consuming seasonal and local products is a hallmark of the Mediterranean diet. These foods are typically fresher, more flavorful, and packed with essential nutrients that support overall health and weight regulation. Seasonal fruits and vegetables are often fresher and contain more nutrients compared to non-seasonal varieties, which are usually transported from far distances and may lose their nutritional value over time. A diet rich in seasonal produce ensures higher fiber intake, which is important for satiety and weight management. Furthermore, these foods are often lower in calories and free from the added sugars and preservatives found in processed foods. Studies have shown that a high intake of fruits and vegetables is inversely associated with obesity risk due to the lower calorie density and high fiber content of these foods [38]. Eating in alignment with the seasons ensures a balanced and varied intake of nutrients throughout the year. For example, during the colder months, root vegetables like carrots and potatoes are abundant, offering high fiber and vitamin-rich options. In the warmer months, fruits like tomatoes, melons, and berries are abundant, which are hydrating and low in calories. This balance helps maintain a healthy metabolism and supports the body's natural rhythms, which can aid in weight regulation and obesity prevention [39].

3.7. The Role of Mediterranean Sustainability in Reducing Obesity

By integrating sustainability into the diet through local, seasonal food choices and reducing food waste, the Mediterranean lifestyle fosters healthier food practices. These sustainable habits support a balanced approach to weight management by prioritizing whole, unprocessed foods that are naturally low in calories and high in essential nutrients. Moreover, sustainability efforts—such as reducing food waste—directly correlate with less reliance on ultra-processed foods, which are often high in sugar, salt, and fat and contribute to the development of obesity and related chronic conditions. Therefore, maintaining a sustainable food system that promotes the consumption of local, seasonal products and minimizes food waste may offer significant benefits in the fight against obesity [40].

Table 2 summarizes the benefits of sustainable Mediterranean practices on obesity prevention.

Table 2. Benefits of Sustainable Mediterranean Practices on Obesity Prevention.

Sustainable Practice	Obesity Prevention Benefit	Example
Seasonal and Local Products	Nutrient-dense, low-calorie foods that support weight control	Fresh vegetables, fruits, and whole grains
Food Waste Reduction	Promotes mindful eating and reduces overconsumption of processed foods	Using leftovers, reducing excess portions
Support for Local Agriculture	Access to fresher, more affordable foods, which help maintain a healthy weight	Shopping at local farmers' markets

3.8. Mechanisms by Which the Mediterranean Lifestyle Affects Obesity

The Mediterranean lifestyle, with its emphasis on diet, physical activity, social interaction, and environmental factors, influences obesity through various biological and physiological mechanisms. Below, is explored several key pathways by which this lifestyle contributes to weight regulation and the prevention of obesity.

3.9. Impact on Satiety and Appetite Regulation

One of the primary mechanisms by which the Mediterranean diet influences obesity is through its effects on satiety, the feeling of fullness that helps regulate food intake. The Mediterranean diet is rich in fiber, healthy fats, and protein, all of which contribute to increased satiety. High fiber intake,

particularly from fruits, vegetables, and whole grains, slows gastric emptying, promotes a feeling of fullness, and reduces overall calorie intake. This mechanism has been shown to be effective in preventing overeating, a key factor in the development of obesity [41].

Moreover, the Mediterranean diet's emphasis on healthy fats, particularly olive oil, has been linked to better appetite regulation. Olive oil is rich in monounsaturated fatty acids (MUFA), which have been shown to influence hunger-regulating hormones, such as ghrelin and leptin. Ghrelin, often referred to as the "hunger hormone," stimulates appetite, while leptin signals to the brain that the body has sufficient energy stores. Consuming MUFAs may reduce ghrelin levels and increase leptin sensitivity, thereby reducing hunger and promoting weight maintenance [42].

3.10. β -Oxidation and Fat Metabolism

Another crucial pathway through which the Mediterranean lifestyle may impact obesity is its effect on β -oxidation, the process by which the body breaks down fatty acids for energy. The Mediterranean diet, particularly with its emphasis on healthy fats like olive oil, nuts, and fish, can improve fat metabolism and enhance β -oxidation. The polyunsaturated fatty acids (PUFAs) found in fish, such as omega-3 fatty acids, have been shown to promote β -oxidation and improve fat utilization, reducing the storage of excess fat in adipose tissue. This process not only supports weight loss but also reduces the risk of obesity-related metabolic disorders, such as insulin resistance and non-alcoholic fatty liver disease [43].

Additionally, physical activity, another pillar of the Mediterranean lifestyle, is known to enhance β -oxidation by increasing the body's reliance on fat for energy during exercise. Regular physical activity increases mitochondrial function and fat oxidation rates, which helps in reducing overall body fat and preventing obesity [44].

3.11. Hormonal Regulation and Insulin Sensitivity

The Mediterranean lifestyle's influence on obesity extends to hormonal regulation, particularly in the context of insulin sensitivity. Insulin is a hormone that regulates glucose metabolism and fat storage, and impaired insulin sensitivity is a hallmark of obesity. The Mediterranean diet, with its emphasis on whole foods, high-fiber vegetables, and healthy fats, has been shown to improve insulin sensitivity, thereby enhancing the body's ability to regulate blood sugar levels and prevent fat accumulation. Several studies have demonstrated that the consumption of healthy fats, such as those found in olive oil, can improve insulin sensitivity by modulating the expression of genes involved in glucose and lipid metabolism. The Mediterranean diet's ability to reduce inflammation, which is often elevated in obesity, also contributes to better insulin sensitivity. Lowering systemic inflammation is essential in preventing the development of obesity and its associated metabolic complications [45].

3.12. Impact on Inflammation and Oxidative Stress

Chronic low-grade inflammation and oxidative stress are critical factors in the development of obesity and related metabolic disorders. The Mediterranean diet has been shown to have anti-inflammatory and antioxidant properties, largely due to the high intake of polyphenols found in olive oil, fruits, vegetables, and nuts. These antioxidants neutralize free radicals, reducing oxidative stress and inflammation that can impair metabolic function and contribute to weight gain [46]. In particular, the polyphenols in olive oil, such as hydroxytyrosol, have been shown to exert anti-inflammatory effects by inhibiting pro-inflammatory cytokines and promoting the expression of anti-inflammatory molecules. These mechanisms may play a significant role in mitigating the inflammatory responses that contribute to obesity and other chronic conditions [47].

3.13. Influence on Gut Microbiota

The Mediterranean diet's high fiber content not only promotes satiety and improves insulin sensitivity but also positively influences the gut microbiota, which has a profound impact on obesity. A balanced and diverse gut microbiota is essential for the digestion of food and the regulation of metabolism. Studies have shown that the Mediterranean diet, with its emphasis on plant-based foods, probiotics, and prebiotics, fosters a healthy gut microbiome, which in turn promotes the metabolism of fats and carbohydrates, leading to improved weight regulation and reduced obesity risk [48]. The Mediterranean diet also may support the production of short-chain fatty acids (SCFAs), which are produced during the fermentation of fiber by gut bacteria. SCFAs, such as butyrate, have been shown to promote fat oxidation, enhance insulin sensitivity, and reduce appetite, all of which contribute to obesity prevention [49,50].

4. Discussion

The Mediterranean way of life has been extensively studied and praised for its potential in the prevention and management of obesity, with a focus on sustainable, healthy practices that address both individual well-being and environmental concerns. One of the core principles of this lifestyle is its emphasis on local, seasonal foods, and its reduction of food waste, which not only benefits metabolic health but also mitigates environmental degradation. The Mediterranean diet prioritizes plant-based foods, including fruits, vegetables, legumes, whole grains, and nuts, along with moderate portions of animal products. This balanced approach has been consistently linked to lower rates of obesity and better metabolic outcomes, as it encourages the consumption of whole foods, which tend to be more nutrient-dense and lower in calories. The high fiber content of plant-based foods plays a pivotal role in promoting satiety and regulating appetite, helping to prevent overeating [51].

In addition to the well-known benefits of the Mediterranean diet, there is growing evidence suggesting that this dietary pattern has a direct influence on specific hormonal pathways related to obesity. Hormones such as ghrelin, leptin, and insulin are crucial for regulating appetite, fat storage, and energy balance. The Mediterranean diet, with its emphasis on healthy fats like those found in olive oil, has been shown to reduce ghrelin levels, which is the hormone responsible for stimulating hunger. At the same time, it enhances leptin sensitivity, a hormone that promotes satiety and helps regulate long-term energy balance. These hormonal effects support weight regulation by reducing the overall drive to consume excessive calories [52].

Moreover, the Mediterranean diet's ability to improve insulin sensitivity is a significant factor in its effectiveness for managing obesity. Diets rich in monounsaturated fats and low in refined sugars, such as those consumed in Mediterranean cultures, have been shown to lower insulin resistance, a key factor in the development of obesity and type 2 diabetes [53]. The intake of whole grains, legumes, and fresh fruits, common in Mediterranean diets, provides a steady release of glucose, preventing insulin spikes and reducing the risk of fat accumulation around the abdomen. This steady glucose metabolism is associated with a reduced risk of obesity, as it avoids the insulin imbalances that can lead to excessive fat storage [54].

Another critical aspect of the Mediterranean diet is its impact on fat oxidation. Recent studies have highlighted that the Mediterranean diet promotes fat burning, especially during physical activity. The monounsaturated fats found in extra virgin olive oil, along with polyphenols such as oleuropein, increase fat oxidation rates during moderate exercise. This effect is particularly important for individuals seeking to prevent or reduce obesity, as it promotes the use of fat as a source of energy rather than the accumulation of fat in the body [55]. Polyphenols in Mediterranean foods like olive oil, red wine, and certain herbs also contribute to the reduction of oxidative stress in the body, which can impair metabolic function and contribute to the development of obesity [56].

The role of traditional Mediterranean foods in weight management is significant. For instance, olive oil has long been known for its health benefits, particularly its role in reducing visceral fat. The

oleic acid in olive oil supports fat metabolism by increasing the activity of enzymes responsible for breaking down fat. Additionally, the inclusion of wild greens and herbs, such as oregano, basil, and rosemary, provides antioxidant properties that protect cells from oxidative damage, thereby supporting efficient fat metabolism and reducing fat storage. These wild greens are not only nutritious but also help reduce the inflammatory processes that often accompany obesity and metabolic syndrome [57].

In addition to fat oxidation, the Mediterranean diet's emphasis on vegetables, particularly dark leafy greens like spinach and kale, plays a significant role in improving digestive health. These foods are rich in fiber, which helps to regulate bowel movements and promote feelings of fullness. Consuming a variety of these fiber-rich vegetables has been associated with lower body weight and reduced risk of obesity, as fiber slows digestion and prevents overeating. Similarly, legumes such as lentils and chickpeas, which are a cornerstone of Mediterranean diets, provide both protein and fiber, making them an excellent food choice for weight control. Research indicates that people who consume higher amounts of legumes are less likely to be obese, as these foods help manage appetite and prevent excessive calorie intake [58].

Mindful eating, which is central to the Mediterranean lifestyle, also contributes to obesity prevention. By emphasizing the importance of taking time to enjoy meals in a social context, Mediterranean cultures promote slower eating and better recognition of hunger cues. Studies suggest that this mindful approach leads to more appropriate portion sizes and reduces the tendency to overeat. Social eating practices encourage individuals to engage in balanced meals, avoid unhealthy snacking, and make healthier food choices. This social structure helps maintain a healthier body weight, as individuals are less likely to consume calorie-dense, processed foods when they are eating in the company of others [59].

The seasonal and local nature of Mediterranean food consumption is another important factor in weight management. Seasonal produce is often fresher, more nutrient-dense, and lower in calories compared to non-seasonal products. Research has shown that consuming seasonal fruits and vegetables, which are often lower in energy density, is associated with lower rates of obesity. Seasonal foods such as berries in summer and root vegetables in winter provide essential nutrients, fiber, and antioxidants that support metabolism and help maintain healthy body weight. These foods not only nourish the body but also encourage variety in the diet, ensuring that the body receives a broad spectrum of nutrients throughout the year [60].

Sustainability plays a critical role in the Mediterranean diet, particularly in its emphasis on reducing food waste. The diet encourages the use of all parts of plants and animals, ensuring that food resources are utilized efficiently. By reducing food waste and promoting the consumption of whole, minimally processed foods, the Mediterranean diet supports environmental sustainability while also preventing the overconsumption of calories. Diets that rely on processed foods are typically higher in calories and lower in nutrients, contributing to weight gain and obesity. Conversely, the Mediterranean approach, with its focus on local, fresh foods, supports both healthier eating habits and a reduced environmental footprint, which can ultimately lead to better weight management and improved public health outcomes [61].

5. Conclusions

The Mediterranean lifestyle offers a holistic and evidence-based approach to the prevention and management of obesity. It is not merely a dietary pattern but an integrated way of living that includes a rich variety of protective habits. The combined implementation of a nutrient-dense and anti-inflammatory diet, regular physical activity, restorative sleep, and strong social connections contributes significantly to the regulation of body weight, improvement of metabolic markers, and overall well-being.

The Mediterranean diet, characterized by high consumption of fruits, vegetables, legumes, whole grains, nuts, and olive oil, along with moderate intake of fish, dairy, and red wine, has demonstrated consistent benefits in promoting satiety, reducing systemic inflammation, and

supporting metabolic flexibility. The inclusion of healthy fats, such as monounsaturated fatty acids from extra-virgin olive oil, contributes to the modulation of appetite-related hormones like leptin and ghrelin, while the high fiber content enhances gut microbiota diversity and glucose homeostasis.

Moreover, lifestyle components such as frequent physical activity, often integrated into daily life through walking, gardening, or manual labor, may contribute to increased energy expenditure and improved insulin sensitivity. Adequate and consistent sleep patterns support hormonal balance, particularly in cortisol and melatonin rhythms, further influencing appetite regulation and fat storage. In parallel, strong social engagement, a core element of the Mediterranean way of life, is associated with lower stress levels, healthier eating behaviors, and reduced risk of emotional eating.

Although the Mediterranean lifestyle is widely associated with favorable health outcomes, including the prevention and reduction of obesity, it is important to recognize that individual responses to dietary and lifestyle interventions may vary considerably. Genetic predispositions, gut microbiota composition, socioeconomic status, and psychological factors all play a role in how effectively a person can adopt and benefit from these habits.

Therefore, personalized nutrition and lifestyle strategies, tailored to an individual's biological, environmental, and psychosocial profile, could further enhance the effectiveness of obesity prevention efforts. Future research should focus on identifying the specific genetic markers, behavioral traits, and environmental conditions that influence adherence to the Mediterranean lifestyle, as well as the metabolic outcomes it produces. Integrating omics technologies and behavioral science may pave the way for more targeted and impactful interventions that build upon the traditional foundations of the Mediterranean lifestyle.

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