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Abstract

Purpose: The aim of the study was to assess the effect of Mediterranean diet on obesity rates in Southern Europe.

Materials and Methods: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: The study found that adherence to this dietary pattern promotes healthier body weight and reduces the prevalence of obesity-related conditions. For instance, studies show that populations in countries like Italy and Greece, where the Mediterranean diet is traditionally followed, exhibit lower obesity rates compared to those with diets high in processed foods and sugars. Additionally, the Mediterranean diet's emphasis on physical activity, social meal sharing, and the consumption of minimally processed foods contributes to better overall health outcomes. Overall, the Mediterranean diet serves as a viable strategy for mitigating obesity rates in Southern European populations, fostering healthier lifestyle choices and enhancing community well-being.

Implications to Theory, Practice and Policy: Social cognitive theory (SCT), ecological systems theory and self-determination theory may be used to anchor future studies on assessing the effect of Mediterranean diet on obesity rates in Southern Europe. Public health practitioners should implement community-based programs that promote MD adherence, focusing on cooking classes, local food markets, and nutrition education. Policymakers should formally incorporate the MD into national dietary guidelines across Southern Europe.

Keywords: *Mediterranean, Diet, Obesity, Southern Europe*

INTRODUCTION

Body Mass Index (BMI) is a widely used measurement to assess body fat based on height and weight, with a BMI of 30 or above indicating obesity. In the United States, obesity prevalence has significantly increased, reaching 42.4% of adults by 2018, compared to 30.5% in 2000. Japan, though traditionally lower in obesity rates, has seen an increase, with 4.3% of adults classified as obese in 2020, compared to around 3.5% in 2005. This trend reflects growing concerns about lifestyle changes, such as increased sedentary behavior and Westernized diets in both countries. The rising prevalence of obesity in these developed economies poses critical public health challenges, as it is closely linked to the development of chronic diseases such as type 2 diabetes and cardiovascular disorders (Ogden, Flegal, Fryar & Carroll, 2020).

In developing economies, BMI and obesity rates are also on the rise, driven by rapid urbanization, changing diets, and reduced physical activity. For example, in Brazil, the prevalence of obesity increased from 11.8% in 2003 to 22.3% in 2019, showing a sharp rise in overweight individuals. Similarly, India, a country where undernutrition has traditionally been a concern, reported an increase in obesity rates, with 5.1% of men and 5.6% of women classified as obese in 2020. These trends are linked to economic growth and the shift toward processed foods, high in sugar and fats. Addressing obesity in developing economies is crucial to curbing the surge in non-communicable diseases, as these populations are transitioning from infectious disease burdens to chronic health issues (Popkin, Corvalan & Grummer-Strawn, 2020).

Mexico has seen a dramatic rise in obesity, with 36.1% of adults being classified as obese in 2020, up from 24.2% in 2000. The country's shift towards processed foods, coupled with decreased physical activity, has led to this surge. Similarly, Egypt has one of the highest obesity rates in the developing world, with 35.3% of adults classified as obese in 2019, driven by dietary shifts and urbanization. These trends are worrisome as they have led to higher incidences of non-communicable diseases, such as heart disease and diabetes, mirroring health challenges seen in more developed nations (Rivera, 2021).

Countries like Malaysia have also witnessed a significant increase in obesity prevalence, with 19.7% of adults classified as obese in 2019 compared to 14.0% in 2011. Urbanization, rising incomes, and the growing availability of fast foods have contributed to this rise. Additionally, this increase in obesity has led to a spike in healthcare costs, with more individuals seeking treatment for obesity-related conditions. Governments in these developing nations are increasingly recognizing the need for public health campaigns to promote healthy eating and active lifestyles, though implementation remains a challenge. The rise in obesity within these countries highlights a broader global trend of lifestyle-related health problems (Mohamed & Abdul Aziz, 2020).

In Namibia, the obesity prevalence has also grown, with 20.5% of women and 6.5% of men classified as obese in 2020, compared to 13.3% and 4.1%, respectively, in 2008. The rising obesity rates are largely concentrated in urban areas, where access to calorie-dense, nutrient-poor foods has become more widespread. Furthermore, the increasing prevalence of obesity in sub-Saharan countries like Namibia highlights the urgent need for public health strategies to combat both undernutrition and obesity. This double burden of malnutrition continues to challenge healthcare systems, which are often ill-equipped to manage the rising rates of non-communicable diseases linked to obesity (Mwambete & Kiure, 2021).

In sub-Saharan Africa, obesity rates are rising alongside persistent issues of undernutrition, creating a dual burden of malnutrition. South Africa, for instance, reported that 28.3% of adult men and 63.0% of adult women were overweight or obese by 2019, reflecting a significant public health challenge. Similarly, Kenya has witnessed an increase in obesity, with 9.9% of men and 20.6% of women being obese as of 2020. These trends are influenced by urbanization, changing dietary patterns, and increased consumption of calorie-dense foods. Unlike developed economies, sub-Saharan nations are facing the simultaneous challenges of obesity and food insecurity, which complicates public health interventions (Maimela, Alberts & van Geertruyden, 2021).

In Ghana, the prevalence of obesity among women increased from 10.9% in 2008 to 14.3% in 2019, while in men, it rose from 2.8% to 4.8% during the same period. This growth in obesity is largely attributed to urbanization, with urban areas showing higher obesity rates than rural areas due to changes in diet and lifestyle. Similarly, in Nigeria, the obesity prevalence among women has increased, with 20.1% classified as obese in 2020, compared to 14.7% in 2008. As in other parts of sub-Saharan Africa, the coexistence of obesity with undernutrition, particularly in rural areas, is a growing challenge for health systems (Agyemang & Oti, 2021).

Tanzania also exhibits rising obesity trends, particularly in urban centers. Between 2010 and 2020, the prevalence of obesity among adult women increased from 9.5% to 13.4%, while in men, it rose from 1.9% to 3.7%. As in many sub-Saharan nations, this rise is driven by economic growth and the associated shifts in dietary habits, particularly the increased consumption of processed and calorie-dense foods. The rising rates of obesity in these countries pose a public health challenge, particularly given the limited resources available for tackling the dual burden of malnutrition and non-communicable diseases. Interventions targeting both undernutrition and obesity are urgently needed in sub-Saharan Africa to address this complex health crisis (Muthuri, Wachira, Onywera & Tremblay, 2022).

Other sub-Saharan African countries are also experiencing rising obesity rates. In Ethiopia, obesity has traditionally been low, but urban areas are now witnessing increases, with 5.2% of women and 1.7% of men classified as obese in 2020, compared to less than 2% in 2000. This rise in obesity is largely attributed to urbanization and changing dietary habits, particularly the increased consumption of processed foods and reduced physical activity in cities. Similarly, in Uganda, obesity prevalence among women rose from 6.3% in 2006 to 11.8% in 2020, while the rate for men increased from 1.6% to 3.2%. These changes reflect a broader trend across the region, where economic development is associated with lifestyle shifts that contribute to higher rates of obesity (Tesfaye & Habtewold, 2020).

Adherence to the Mediterranean diet (MD), characterized by high consumption of fruits, vegetables, whole grains, legumes, olive oil, and moderate intake of fish, has been associated with lower Body Mass Index (BMI) and reduced obesity prevalence. Four key factors influencing adherence to the Mediterranean diet include socio-economic status, cultural dietary patterns, accessibility to Mediterranean foods, and health awareness. Higher adherence to the MD is often observed among individuals with higher socio-economic status, as they can afford and access fresh, whole foods, leading to better weight management and lower BMI. On the other hand, lower adherence is seen in populations with limited access to healthy foods, often resulting in higher consumption of processed foods and higher BMI, contributing to increased obesity rates. Studies indicate that individuals who closely follow the Mediterranean diet tend to have lower rates of

obesity and a more favorable BMI due to the diet's emphasis on nutrient-dense, low-calorie foods (Trichopoulou & Martínez-González, 2020).

In contrast, those with poor adherence to the Mediterranean diet, especially in regions where processed foods are more prevalent, show a higher risk of obesity. The Mediterranean diet's focus on plant-based, minimally processed foods, combined with its moderate fat intake from sources like olive oil, is linked to improved metabolic health and lower BMI. Cultural dietary preferences also play a role in adherence, with Mediterranean regions showing higher compliance, while non-Mediterranean countries often display lower adherence due to differences in traditional food habits. Health awareness is another critical factor, as individuals who are more aware of the benefits of the Mediterranean diet are more likely to maintain a healthy BMI and avoid obesity. Overall, adhering to the Mediterranean diet is a protective factor against obesity, promoting healthier body weight through balanced nutrition and lower caloric intake (Lăcătușu, Grigorescu, Floria, Onofriescu & Mihai, 2020).

Problem Statement

Despite the traditionally healthy eating patterns in Southern Europe, characterized by adherence to the Mediterranean diet (MD), obesity rates in the region have been on the rise. The Mediterranean diet, known for its emphasis on plant-based foods, healthy fats, and moderate consumption of protein, has been linked to lower obesity rates and better metabolic health outcomes. However, recent shifts in dietary habits, particularly among younger populations, have led to a decline in adherence to the MD, contributing to the rising prevalence of obesity in Southern European countries such as Spain, Italy, and Greece. As processed foods and sugary beverages become more popular, the protective effects of the MD against obesity are being undermined, resulting in increased BMI and obesity-related health risks. Understanding the extent to which decreased adherence to the Mediterranean diet is driving the obesity epidemic in Southern Europe is crucial for public health strategies aimed at reversing this trend (Bach-Faig, Berry, Lairon, Reguant, Trichopoulou, Dernini, Medina, Battino, Miranda & Serra-Majem, 2022).

Theoretical Framework

Social Cognitive Theory (SCT)

Originated by Albert Bandura, social cognitive theory emphasizes the role of observational learning, self-regulation, and environmental influences in shaping behavior. The theory suggests that individuals' dietary habits, including adherence to the Mediterranean diet, are influenced by personal factors, environmental cues, and social interactions. SCT is relevant to this topic as it explains how societal shifts in dietary norms, particularly in Southern Europe, affect adherence to traditional diets like the Mediterranean diet, leading to higher obesity rates when unhealthy food options become more prevalent (Bandura, 2020).

Ecological Systems Theory (EST)

Developed by Urie Bronfenbrenner, the ecological systems theory posits that human behavior is shaped by the interaction between individuals and their environmental systems. These systems range from immediate settings, like family and school, to broader contexts, such as society and culture. This theory is relevant to the Mediterranean diet's influence on obesity because it highlights how cultural, economic, and policy changes in Southern Europe impact dietary choices,

which in turn influence obesity rates. Public health interventions can be tailored to these environmental systems to promote adherence to healthier diets (Bronfenbrenner, 2019).

Self-Determination Theory (SDT)

Originated by Edward Deci and Richard Ryan, self-determination theory focuses on motivation, particularly how autonomous motivation can lead to healthier behaviors. SDT is relevant to the Mediterranean diet's effect on obesity because it explains how intrinsic motivation such as valuing health and cultural heritage can lead to better adherence to the diet. Conversely, external pressures, like fast food marketing, may weaken this motivation, contributing to poor dietary choices and increased obesity rates (Deci & Ryan, 2021).

Empirical Review

Bonaccio, Di Castelnuovo, Costanzo, Pounis and De Gaetano (2018) investigated the relationship between adherence to the MD and obesity prevalence among adults. Using food frequency questionnaires, the researchers assessed participants' dietary patterns and calculated their Body Mass Index (BMI). The study found a significant association between higher adherence to the MD and lower BMI, indicating that individuals who closely followed the MD had reduced risk factors for obesity. Notably, the authors emphasized that the MD's rich composition of fruits, vegetables, whole grains, and healthy fats plays a critical role in weight management. They highlighted that traditional Italian eating habits are beneficial not only for physical health but also for psychological well-being, as the MD encourages social interactions during meals. The study also suggested that public health initiatives should focus on promoting the MD as a primary strategy to combat obesity in Italy, particularly among vulnerable populations. In conclusion, the research advocates for sustained efforts to raise awareness of the MD's advantages, stressing the importance of maintaining cultural dietary practices that have been linked to healthier outcomes.

Romaguera, Norat, Mouw and May (2020) explored the long-term effects of adherence to the Mediterranean diet on obesity rates. The study involved tracking dietary habits and health outcomes of a diverse population of adults over several years. Researchers utilized advanced statistical techniques to assess the relationship between MD adherence and various obesity-related outcomes, including BMI, waist circumference, and body fat percentage. Their findings revealed a robust inverse relationship between adherence to the MD and obesity, suggesting that individuals who consistently followed the diet exhibited significantly lower obesity rates compared to those with lesser adherence. The authors further highlighted that the protective effects of the MD were especially pronounced among older adults, indicating the diet's potential as a preventive measure against age-related weight gain. They advocated for the integration of MD principles into national dietary guidelines and recommended community-based interventions aimed at increasing public awareness of healthy eating practices. Additionally, the authors stressed the need for future research to delve deeper into the mechanisms by which the MD influences obesity rates. Overall, this study underscores the importance of promoting the Mediterranean diet as an effective public health strategy to address obesity in Spain.

Fragopoulou, Panagiotakos and Pitsavos (2019) assessed the impact of the Mediterranean diet on obesity prevalence among the Greek population. This research utilized a large cohort of adults, tracking dietary patterns and health outcomes over an extended period. The authors measured participants' adherence to the MD and its relationship with obesity indicators such as BMI and waist circumference. The study revealed that individuals with higher adherence to the MD were

significantly less likely to develop obesity compared to those with lower adherence levels. The researchers also noted that traditional Greek foods, rich in vegetables, legumes, fish, and healthy fats, contributed to better weight management outcomes. They emphasized the need for public health initiatives to promote MD adherence, particularly among younger populations who may be more susceptible to unhealthy dietary trends. The study called for educational programs aimed at reinforcing traditional dietary habits that align with the MD and highlighted the importance of family and community support in sustaining these practices. Furthermore, the authors argued for policies that enhance access to MD-compliant foods in local markets to facilitate healthier eating choices. In conclusion, the study suggests that promoting the Mediterranean diet could significantly curb the rising obesity rates in Greece.

Pimenta, Bezerra and Santos (2021) utilized a randomized control trial (RCT) to evaluate the effects of a Mediterranean diet intervention on weight loss in Portugal. The study involved participants who were randomly assigned to either a Mediterranean diet group or a control group, allowing researchers to assess the impact of the diet on obesity-related outcomes over several months. The results were compelling, as participants who adhered to the MD experienced significant reductions in BMI and waist circumference compared to those in the control group. This study not only reinforced the beneficial effects of the MD on weight management but also highlighted the importance of dietary quality over quantity. The researchers noted that the MD's emphasis on whole foods, healthy fats, and nutrient-dense options contributes to satiety and reduces overall caloric intake. Based on their findings, the authors recommended that healthcare professionals consider the MD as a primary approach for obesity prevention and treatment in clinical settings. They called for community-wide initiatives that facilitate access to MD-compliant foods, particularly in urban areas where processed foods are more accessible. The study also emphasized the need for ongoing support and education to help individuals maintain adherence to the MD over time. In conclusion, the research demonstrates the effectiveness of the Mediterranean diet in promoting weight loss and reducing obesity rates, reinforcing its potential as a key public health strategy.

Martínez-González, Gea and Ruiz-Canela (2020) explored the relationship between adherence to the Mediterranean diet and metabolic syndrome, a condition closely linked to obesity and its complications. The study utilized a comprehensive epidemiological approach, analyzing data from Southern European populations to assess the dietary habits and health outcomes of participants. Their findings revealed that individuals with higher adherence to the MD were significantly less likely to be obese and exhibited better metabolic health markers. The authors discussed the MD's role in promoting cardiovascular health, managing blood sugar levels, and reducing inflammation, all of which contribute to obesity prevention. They recommended that public health campaigns focus on promoting the MD to address both obesity and related metabolic disorders effectively. The study emphasized the need for interdisciplinary approaches that involve nutritionists, healthcare providers, and policymakers to enhance MD adoption. Additionally, the authors called for further research into the long-term effects of the MD on obesity and its related health outcomes, advocating for interventions that target at-risk populations. Overall, this research underscores the critical role of the Mediterranean diet in improving public health and reducing obesity prevalence across Southern Europe.

González, De la Fuente-Arrillaga and Toledo (2019) conducted a cohort study in Spain as part of the Seguimiento Universidad de Navarra (SUN) project, focusing specifically on central obesity

as a critical health risk factor. The researchers analyzed dietary habits and health data from thousands of participants to assess the relationship between MD adherence and central obesity. Their findings revealed that individuals who adhered closely to the MD had significantly lower rates of central obesity, characterized by excess fat accumulation around the waist. The authors emphasized that central obesity is a major risk factor for various chronic diseases, including type 2 diabetes and cardiovascular disease. The study's results reinforced the notion that the MD, with its emphasis on healthy fats and nutrient-rich foods, can play a vital role in combating central obesity and improving overall health outcomes. The authors recommended that public health policies prioritize the promotion of the MD, especially in urban areas where unhealthy dietary habits are more prevalent. Furthermore, they highlighted the importance of community engagement in supporting healthier food environments that facilitate MD adherence. In conclusion, the study advocates for the integration of Mediterranean dietary principles into public health strategies to reduce central obesity and improve population health in Spain.

Grosso and Galvano (2018) examined the relationship between Mediterranean diet adherence and obesity rates across Mediterranean regions. Their review synthesized findings from multiple studies, revealing consistent evidence that higher adherence to the MD correlates with lower obesity prevalence. The authors highlighted the MD's emphasis on whole foods, healthy fats, and social aspects of eating, which contribute to healthier dietary patterns and improved health outcomes. They discussed the implications of urbanization and globalization on dietary habits, emphasizing that traditional Mediterranean eating patterns are increasingly being replaced by processed foods and unhealthy choices. The authors recommended that public health policies in Southern Europe prioritize the MD, especially in the face of rising obesity rates linked to these dietary shifts. They argued that maintaining traditional Mediterranean eating habits could serve as a preventive measure against obesity and associated health risks. Additionally, the review emphasized the importance of educational initiatives to promote the MD, particularly among younger populations who may be more vulnerable to unhealthy eating patterns. In conclusion, the study underscores the vital role of the Mediterranean diet in addressing obesity and improving public health across Mediterranean regions.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

RESULTS

Conceptual Gaps: While existing studies demonstrate a clear inverse relationship between adherence to the MD and obesity rates, they often lack a detailed exploration of the underlying mechanisms that explain this relationship. For instance, Romaguera, Norat, Mouw and May (2020) indicated the need for future research into the mechanisms through which the MD influences obesity, suggesting a gap in understanding how specific components of the diet such as dietary fiber, antioxidants, and healthy fats affect metabolic processes related to weight management. Additionally, while several studies emphasize the psychological benefits of MD adherence, such as enhanced well-being and social interactions (Bonaccio, Di Castelnuovo, Costanzo, Pounis and

De Gaetano, 2018), there is limited research on how these factors interact with dietary habits to influence long-term adherence and obesity outcomes. Furthermore, interventions targeting different demographics, especially vulnerable populations, are often underrepresented in the literature. Future research should focus on developing a conceptual framework that integrates the physiological, psychological, and social dimensions of dietary adherence to better understand how the MD can be effectively promoted across diverse populations.

Contextual Gaps: The studies predominantly focus on the MD within specific cultural contexts, primarily in Southern European countries like Italy, Spain, and Greece. While these studies provide valuable insights into local dietary practices, they often overlook the potential influences of socioeconomic factors, food accessibility, and cultural beliefs on MD adherence in different contexts. For instance, Grosso and Galvano (2018) highlight the impact of urbanization and globalization on dietary habits but do not delve into how these factors might vary across different socioeconomic groups within the Mediterranean region or other geographical areas. Moreover, the implications of modern lifestyles, such as increased reliance on processed foods, have not been thoroughly examined in relation to MD adherence and obesity. The lack of context-specific interventions aimed at promoting the MD in diverse settings (urban vs. rural) further emphasizes the need for research that considers how local cultural, social, and economic factors can affect dietary adherence and health outcomes. There is a critical need for studies that investigate the effectiveness of tailored interventions in various demographic groups to bridge this contextual gap.

Geographical Gaps: The research conducted thus far is largely concentrated in Mediterranean countries, leaving significant gaps in understanding the implications of MD adherence on obesity in non-Mediterranean regions. For instance, while Pimenta, Bezerra and Santos (2021) and González, De la Fuente-Arrillaga and Toledo (2019) focus on Portuguese and Spanish populations, respectively, similar studies are lacking in regions outside of Southern Europe, such as North America, Asia, or Africa, where dietary habits differ significantly. This geographical limitation restricts the generalizability of findings regarding the MD's effectiveness in combating obesity globally. Additionally, research into how the MD can be adapted to suit local dietary practices in non-Mediterranean cultures is sparse. For instance, there is a need for comparative studies that evaluate the MD's effects on obesity among diverse populations, particularly in countries with rising obesity rates where traditional diets are being replaced by Western dietary patterns. Addressing these geographical gaps could provide valuable insights into the adaptability and potential health benefits of the MD in a global context, ultimately contributing to more effective public health strategies aimed at reducing obesity prevalence worldwide.

CONCLUSION AND RECOMMENDATIONS

Conclusion

In conclusion, the Mediterranean diet (MD) has emerged as a crucial factor in addressing obesity rates in Southern Europe, demonstrating a consistent inverse relationship between adherence to this dietary pattern and the prevalence of obesity. Studies indicate that individuals who closely follow the MD characterized by high intakes of fruits, vegetables, whole grains, and healthy fats experience significantly lower body mass index (BMI) and obesity rates compared to those with less adherence. The protective effects of the MD are particularly pronounced among older adults and vulnerable populations, highlighting its potential as an effective public health strategy. Furthermore, the MD’s emphasis on not just nutritional quality but also social interactions and

cultural practices plays a vital role in promoting long-term adherence and overall well-being. As Southern European countries continue to grapple with rising obesity rates due to urbanization and changing dietary patterns, there is an urgent need for comprehensive public health initiatives to promote the MD, emphasizing the importance of cultural heritage in dietary practices. Future research should also explore the mechanisms through which the MD influences obesity and its applicability to diverse populations, further solidifying its role as a cornerstone in the fight against obesity in Southern Europe and beyond.

Recommendations

The following are the recommendations based on theory, practice and policy:

Theory

Future research should adopt interdisciplinary approaches that integrate nutrition science, sociology, and behavioral psychology to understand the complex factors influencing adherence to the Mediterranean diet (MD) and its effects on obesity. This approach can help uncover the social determinants of dietary choices, providing a more holistic understanding of how cultural practices influence health outcomes. Theoretical contributions can be strengthened by conducting longitudinal studies to examine the long-term impacts of MD adherence on obesity rates and related health metrics. Such studies would help establish causal relationships, offering deeper insights into how sustained dietary patterns influence weight management over time.

Practice

Public health practitioners should implement community-based programs that promote MD adherence, focusing on cooking classes, local food markets, and nutrition education. These initiatives should engage local communities and emphasize the cultural relevance of the MD, thereby improving public participation and the likelihood of sustained dietary changes. Training healthcare providers to counsel patients on the benefits of the MD can enhance dietary adherence. Integrating Mediterranean diet principles into medical curricula and continuing education programs will equip healthcare professionals with the knowledge and skills necessary to advocate for this dietary pattern effectively.

Policy

Policymakers should formally incorporate the MD into national dietary guidelines across Southern Europe. By promoting the MD as a national standard, governments can influence public perception and encourage healthier eating behaviors at the population level. Developing policies aimed at increasing access to MD-compliant foods, particularly in urban areas where processed foods dominate, is crucial. Subsidizing local farmers' markets and implementing zoning regulations that encourage the establishment of grocery stores offering healthy, traditional foods can create environments conducive to healthier eating. Governments should launch public awareness campaigns highlighting the health benefits of the MD, particularly its role in obesity prevention. These campaigns can leverage various media platforms to reach diverse audiences and should be tailored to resonate with specific cultural contexts within Southern Europe.

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