



Received: 02-11-2024

Accepted: 12-12-2024

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

The use of Chat GPT for Obesity Management in Greece: A PESTEL Analysis

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Abstract

The treatment of obesity in Greece, which has undesired health, economic and social impacts, requires a holistic approach while the use of strategic management tools such as SWOT and PESTEL analysis can facilitate the fight against the pandemic. The use of Artificial Intelligence in several sectors has increasing applications nowadays. A PESTEL analysis has been realized using the Chat GPT instead of asking the opinion of experts and stakeholders of the healthcare industry. Chat GPT was asked to identify the main political, economic, social, technological, environmental and legal factors affecting obesity management in Greece. It was found that its quick answers

were satisfactory although some additional factors which were not identified by Chat GPT have been proposed. Taking into account that the use of Chat GPT has various limitations related with its training in recent scientific advancements and information it is suggested that it should be used combinedly with human analysis for the achievement of optimum results. Our findings could be used by policy makers, experts and several stakeholders of the obesity management industry in Greece for the improvement of the policies used for treating the contemporary pandemic of obesity.

Keywords: Chat GPT, Greece, Obesity Management, PESTEL, Strategic Analysis

1. Introduction

Obesity consists of a severe problem in Greece with multiple undesired health, social and economic impacts. Additionally, to conventional obesity management Artificial Intelligence (AI) could play a complementary role in the improvement of the required health policies in this field. The study regarding the impact of external factors in the development of obesity management policies can be achieved using PESTEL methodology which can be facilitated using the Chat GTP. The problem of obesity and its treatment in Greece has been investigated by several researchers^[1, 2, 3, 4]. The use of PESTEL methodology in several sectors including in healthcare has been studied^[5, 6, 7]. The use of Chat GPT in obesity treatment has been also investigated in the last few years^[8, 9, 10, 3].

The aim of the current work is to examine the use of Chat GPT in obesity management in Greece using PESTEL analysis.

The structure of the text is as follows: After the literature review the problem of obesity in Greece is analyzed followed by a description of PESTEL methodology. In the next two sections an introduction to Chat GPT is made followed by its use for making a PESTEL analysis for obesity management in Greece. The text ends with discussion of the findings, the conclusions drawn and the citation of the references used.

The current study is innovative since similar studies related to the use of Chat GPT in obesity management in Greece are limited. Therefore, it covers an existing gap in this field. The results could be used from policy makers and several stakeholders of the obesity treatment industry for setting more realistic targets in fighting the pandemic and improving its management in the country.

2. Literature survey

The pandemic of obesity and its consequences in Greece have been studied^[1]. The author stated that the problem of obesity is particularly acute in Greece and the country ranks first in the EU in childhood obesity. He also mentioned that 63% of Greeksover the age of 18 are overweight and obese while obesity has significant health, economic and social impacts. The genetic basis of childhood obesity has been reviewed^[2]. The authors stated that more than 1,100 independent genetic loci

associated with obesity trait have been currently identified. They also mentioned that the decoding of the genetic and molecular/cellular pathophysiology of obesity and the gene-environment interactions will help in obesity management early in life. The use of Chat GPT in obesity management in Greece using SWOT analysis has been investigated^[3]. Chat GPT has been used to answer several questions regarding the strengths, weaknesses, opportunities and threats of obesity management in Greece. The author stated that AI consists of a useful tool in the field of healthcare. A national e-health program for the prevention and management of overweight and obesity in childhood and adolescence in Greece has been studied^[4]. The authors have developed the e-health program which was used in 2,400 children for one year. They stated that after one year the prevalence of obesity decreased by 32.1% while the prevalence of overweight by 26.7%. The health services in males using PESTEL analysis have been analyzed^[5]. The author used PESTEL methodology to understand the advantages and disadvantages of providing male health services from womb to tomb. He proposed that a multidisciplinary strategy that overcomes societal stigma and considers environmental variables is needed. The competitive advantages for maternal and fetal health diagnostic business in the future have been investigated^[6]. The authors used SWOT and PESTEL analysis gathering information from articles, publications and reports. The analysis allowed the author to recommend the best sustainable solutions for the future. A PESTEL analysis of advanced practice radiation therapy in USA has been performed^[7]. The authors made a literature survey regarding this therapy during the past 25 years. They stated that the implementation of the therapy in USA is complex with multifactorial political, environmental, societal, technological, economic and legal aspects to consider. The potential of using the Chat GPT in obesity treatment has been explored^[8]. The author stated that for some patients who cannot be treated with traditional methods AI technologies are a new source of hope. He also mentioned that Chat GPT can provide personalized recommendations on topics such as nutrition plans, exercise programs and psychological support. The effects of Chat GPT generated exercise program in healthy overweight young adults have been studied^[9]. The authors evaluated experimentally whether the Chat GPT generated exercise program was effective in overweight persons. They concluded that the Chat GPT generated exercise program is feasible for overweight young adults to lose weight and improve their cardiovascular fitness. The use of Chat GPT in treating lifestyle-related diseases and disorders has been examined^[10]. The authors categorized the answers of Chat GPT in questions related to a set of 20 lifestyle-related diseases. They stated that Chat GPT provided reasonably accurate information in the majority of the cases. They also mentioned that it could offer initial guidance to the patients before consulting a doctor. The graphical recording technique as an efficient tool in medical teaching regarding obesity in Thailand has been studied^[11]. The author stated that this method enables students to explore holistically the causes of obesity. He also mentioned that the application of graphical recording techniques and PESTEL analysis are useful to medical students strengthening their critical thinking and their creativity. The creation of a sustainable business model in the e-health industry in the Netherlands has been investigated^[12]. The author stated that internal and

external factors influence the development of a sustainable business model for start-ups in the e-health industry. He also mentioned that internal aspects have higher influence in the development of sustainable models than external factors. The use of generative AI in international management education has been examined^[13]. The authors explored the challenges and opportunities that arise from the integration of AI technologies in academic environments. They stated that it should be a balance between the technology-driven aspects of education with the learning-driven considerations. The use of GPT technology in supporting international entrepreneurship has been studied^[14]. The research was focused on how GPT can serve as a strategic tool, communication tool and knowledge leverage tool improving the decision-making process. The authors stated that GPT significantly contributes to strategic planning, market analysis and operational management. The application of AI in marketing has been examined^[15]. The author investigated the potential of AI to improve the marketing efficiency in SMEs. It was conducted using SWOT and PESTEL analysis concluding that the use of these tools can improve the efficiency in SMEs. The Finnish market related to smart home products has been analyzed^[16]. The research was conducted with the support of Chat GPT while a PESTEL analysis was implemented to assess the main factors affecting the establishment of a new company. The foresight in emerging technologies like AI has been studied^[17]. The author explored the opportunities, threats, enablers and barriers of emerging technologies. The study was conducted using SWOT analysis which allows the drawing of useful conclusions. The use of Chat GPT for treating protein energy malnutrition has been investigated^[18]. The author emphasized the need for collaboration between AI technology and healthcare professionals to leverage Chat's GPT capabilities effectively. He also highlighted the significant impact of Chat GPT in providing tailored guidance and support to patients. The use of AI in the enhancement of bariatric surgery education has been investigated^[19]. The authors stated that the integration of AI in healthcare systems present a unique set of challenges which must be rigorously evaluate through ongoing research and real-world testing. The nexus between Mediterranean diet, obesity and climate change has been examined^[20]. The author stated that the broad adoption of Mediterranean diet would reduce the obesity rates, mitigate climate change, reduce the undesired environmental impacts of the food production system and promote the sustainable agriculture which is necessary for the healthy nutrition of an increasing global population. The impacts of obesity treatment on health of children and adolescents have been studied^[21]. The authors assessed the effect of multidisciplinary personalized lifestyle intervention for depressive and anxiety symptoms. They stated that a significant decrease in anxiety and obese scores was noted while females displayed a reduced response to the intervention. A strategic management approach to weight loss program development has been investigated^[22]. The author realized a thorough evaluation using SWOT and PESTEL analysis. The analysis identified the need for a comprehensive weight loss program utilizing diet, exercise, behavioral change and GPL1 receptor agonist medications. The use of Chat GPT and Food4me algorithm in providing personalized dietary recommendations for obese individuals has been studied^[23]. The authors stated that Chat GPT holds some net worthy advantages over the

Food4Me algorithm. They also mentioned that currently it is not advisable for individuals without nutritional expertise to rely on Chat GPT for personalized dietary recommendations. A PESTEL analysis for quality management in the healthcare sector has been implemented [24]. The author has reviewed 15 websites and articles related to this topic. The author has categorized 12 significant points according to their importance and their frequency of presence in the articles. The importance of the external environment in the healthcare sector has been analyzed [25]. The authors reviewed 21 articles stating that the research related to environmental analysis is still very minimal. They also mentioned that the research related to political factors was at 31.25%, to economic factors at 18.75%, to socio-cultural factors at 18.75% and to technological factors at 31.25%. The Covid-19 crisis in China using PESTEL methodology has been analyzed [26]. The research was indented to provide insights on how and why the virus spread so fast in Hubei province in China, whose capital is Wuhan. PESTEL analysis has shown how institutional settings and crisis-management approaches were adapted to challenges before and during crisis. The impact of diversity on the global healthcare sector using PESTLE analysis has been studied [27]. The author proposed to add “diversity” to the analytical PESTEL framework. She concluded that managing diversity effects on the medical workforce will be on benefit to healthcare managers, policy makers and other stakeholders in business diagnostics and strategy analysis. The photovoltaic market in Poland using PESTEL analysis has been analyzed [28]. The authors stated that in recent years an increased proportion of energy in Poland is generated from solar photovoltaics. They also mentioned that potential challenges for improving the solar power generation in the country include better public awareness campaigns, enhanced self-consumption through storage systems and optimized systems placing. The use of PESTEL framework in developing sustainable business strategies has been studied [29]. The authors reviewed the environment of cloud computing using the PESTEL framework stating that the adoption of cloud computing is an effective eco-friendly strategy to reduce the carbon footprint in enterprises. They used the PESTEL framework to analyze several issues related to the adoption of cloud computing technology in business environment. The use of PEST framework in strategic analysis has been studied [30]. The author stated that PEST is a useful analytical tool to assess the external environment that affects an organization. The importance of using PESTEL analysis in strategic management has been analyzed [31]. The author studied an improved version of PESTEL which marks the globalization and regionalization forces which are a significant part of the external environment.

3. The Obesity problem in Greece: A growing concern

Obesity has emerged as a significant public health issue in Greece, reflecting global trends but with unique national characteristics. It is a complex problem influenced by lifestyle changes, economic factors, and cultural practices, posing serious implications for individual health and the country's healthcare system.

3.1 Prevalence and Contributing Factors

Greece has one of the highest obesity rates in Europe. According to recent studies, approximately 60% of Greek

adults and 40% of children are classified as overweight or obese. This alarming trend can be attributed to several factors, including dietary habits, sedentary lifestyles, and socioeconomic challenges.

Traditionally, the Mediterranean diet, rich in fruits, vegetables, whole grains, and olive oil, has been central to Greek culture. However, in recent decades, there has been a shift towards processed foods and high-calorie diets, particularly among younger generations. This dietary change, coupled with a decline in physical activity due to urbanization and modern work environments, has significantly contributed to rising obesity levels.

3.2 Economic and Social Impact

The economic crisis that gripped Greece in the 2010s also played a role in exacerbating the obesity problem. Financial constraints pushed many families toward cheaper, less nutritious food options. At the same time, stress and unemployment led to unhealthy coping mechanisms, such as overeating.

Obesity is not merely a cosmetic issue but a major health concern. It increases the risk of chronic conditions like diabetes, cardiovascular disease, and certain cancers. The burden on Greece's healthcare system is substantial, as obesity-related illnesses account for a significant portion of medical expenses and lost productivity.

3.3 Addressing the Issue

Efforts to combat obesity in Greece require a multi-faceted approach. Public health campaigns promoting the Mediterranean diet, increased access to affordable healthy foods, and encouragement of physical activity are crucial. Schools can play a vital role by offering nutrition education and promoting active lifestyles among children. Government policies, such as subsidies for healthy foods and taxes on sugary beverages, could also help shift consumer behavior. Obesity is a pressing challenge for Greece that demands urgent action. By fostering a return to healthier dietary traditions and prioritizing public health, the country can mitigate the long-term consequences of this epidemic and improve the well-being of its population.

4. PESTEL Analysis: A Strategic Framework

PESTEL analysis is a strategic tool used by organizations to understand the macro-environmental factors that may affect their operations. It stands for **Political, Economic, Social, Technological, Environmental, and Legal** factors. By examining these dimensions, organizations can identify opportunities and threats in their external environment, enabling informed decision-making.

4.1 Political Factors

Political factors refer to government policies, stability, tax regulations, and trade restrictions. For instance, an organization operating in multiple countries must consider differences in trade tariffs or the impact of political stability on its supply chain.

4.2 Economic Factors

Economic conditions, such as inflation, interest rates, and economic growth, influence consumer spending and business profitability. A thriving economy may lead to increased demand for luxury goods, whereas a recession could shift focus toward cost-effective products.

4.3 Social Factors

Cultural trends, demographics, and social attitudes are pivotal in shaping citizens' behavior. For example, increasing health consciousness among citizens has spurred demand for organic and sustainable products.

4.4 Technological Factors

Technological advancements can disrupt organizations or provide growth opportunities. Organizations must monitor innovations like artificial intelligence, digitalization, and renewable energy technologies to remain competitive.

4.5 Environmental Factors

Environmental concerns, including climate change, sustainability, and resource scarcity, are becoming crucial considerations. Organizations adopting eco-friendly practices not only comply with regulations but also appeal to environmentally conscious customers.

4.6 Legal Factors

Legal factors encompass regulations such as labor laws, consumer protection laws, and intellectual property rights. Navigating these laws effectively is essential for avoiding legal penalties and maintaining a positive reputation.

4.7 The Benefits and Limitations of PESTEL Analysis

PESTEL analysis, which stands for Political, Economic, Social, Technological, Environmental, and Legal factors, is a strategic tool used to analyze the macro-environmental forces that can impact an organization or industry. This framework is particularly useful for organizations to identify opportunities and threats in their external environment. However, like any analytical tool, PESTEL analysis has its advantages and limitations.

4.8 Benefits of PESTEL Analysis

Comprehensive Overview of External Environment: PESTEL analysis enables organizations to take a holistic view of the external factors that can influence their operations. By examining political stability, economic conditions, societal trends, technological advancements, environmental concerns, and legal requirements, businesses can gain a thorough understanding of the broader landscape.

Facilitates Strategic Planning: By identifying external opportunities and threats, PESTEL analysis aids in crafting informed and effective strategies. For instance, an organization expanding into a new market can assess risks

such as regulatory challenges or unstable political environments and plan accordingly.

Encourages Proactive Decision-Making: Through a forward-looking approach, organizations can anticipate changes in their external environment and adapt in advance. For example, keeping an eye on environmental policies can help organizations stay compliant with regulations and maintain a positive reputation.

Supports Risk Management: Businesses can mitigate potential risks by understanding the external factors that could negatively impact their performance. For example, monitoring economic indicators like inflation or interest rates allows organizations to prepare for financial volatility.

Versatility Across Industries: PESTEL is a universally applicable tool that can be tailored to different organizations and sectors. Whether used in manufacturing, healthcare, or technology, it provides valuable insights into macro-environmental factors relevant to specific contexts.

4.9 Limitations of PESTEL Analysis

Broad Scope May Lack Specificity: While PESTEL offers a comprehensive framework, it often lacks the granularity needed to address specific challenges. It provides a high-level view rather than actionable details, which can limit its utility for tactical decision-making.

Time-Consuming and Resource-Intensive: Conducting a thorough PESTEL analysis requires significant time and effort, particularly for large organizations operating in multiple regions. Gathering and analyzing accurate and up-to-date data on all six dimensions can be challenging and resource-intensive.

Subjectivity in Analysis: The interpretation of PESTEL factors can be subjective, as it depends on the analyst's perspective and expertise. This can lead to inconsistencies in insights or biased conclusions, especially if the analysis lacks a structured methodology.

Dynamic External Environment: The macro-environment is constantly changing, making PESTEL findings potentially short-lived. For example, sudden changes in political policies or technological breakthroughs can render previously conducted analyses obsolete.

Limited Focus on Internal Factors: PESTEL analysis concentrates solely on external factors, ignoring internal strengths and weaknesses. To develop a well-rounded strategy, it is essential to combine PESTEL with other tools, such as SWOT analysis, which includes an internal perspective.

Table 1: Outline of PESTEL analysis

Political	Economic	Social	Technological	Environmental	Legal
Government stability	Economic growth	Income distribution	International influence	Environmental restrictions	Regional laws
Tax policy	Inflation	Demography	Technology transfer	Climate change	Court system
Regulation	Monetary policy	Education	R&D initiatives	Energy saving	Health & safety
Infrastructure	Employment rate	Lifestyle factors	Communication channels	Workforce health	Law enforcement

5. The Chat GPT and its operation

As an Artificial Intelligence (AI) language model developed by Open AI, Chat GPT is designed to assist users by generating human-like text based on the input it receives. Its operation is rooted in advanced machine learning principles, particularly a type of model known as a transformer, trained on vast amounts of text data.

5.1 Learning from Data

Chat GPT is built on a framework called GPT (Generative Pre-trained Transformer). During its training, it is exposed to an extensive dataset that included books, articles, websites, and other text-based sources. This allows to learn language patterns, grammar, knowledge domains, and even nuances of context. However, its training data only extends

up to 2023, meaning that its knowledge of events and facts beyond that date is limited unless it is connected to a browsing tool.

5.2 Understanding Input

When a user types a query or prompt, Chat GPT analyzes it using algorithms that decode its structure, meaning, and intent. This process relies on natural language processing (NLP) techniques. Its understanding is not perfect since it does not have emotions or personal experiences but it uses statistical probabilities and contextual cues to interpret the input effectively.

5.3 Generating Responses

Once the process is queried, Chat GPT generates a response by predicting the sequence of words most likely to follow, based on its training. For example, if it is asked about the weather, it does not "know" the weather but it can simulate an informed response by drawing from patterns in data that it has seen. If equipped with tools like browsing, it can retrieve current information to give accurate, real-time answers.

5.4 Limitations and Ethical Design

While it strives for accuracy and relevance, it has limitations. Chat GPT lacks personal opinions, the ability to verify the truth of input data, and independent reasoning capabilities. OpenAI has implemented safeguards to prevent misuse and to reduce biases, but users must exercise critical thinking when interpreting its outputs.

In essence, Chat GPT operates as a sophisticated text-based assistant, aiming to facilitate learning, creativity, and productivity. By blending statistical analysis with human language understanding, it provides a resource for tackling diverse tasks and inquiries efficiently.

6. Use of Chat GPT for PESTEL analysis regarding obesity management in Greece

Chat GPT has been questioned about the political, economic, social, technological, environmental and legal factors affecting obesity management in Greece. The answers have been analyzed and presented below.

6.1 Political Factors Affecting Obesity Management in Greece

In Greece, political factors significantly influence obesity management efforts, shaped by healthcare policies, economic constraints, and cultural considerations. The Greek healthcare system operates under a universal model, yet it faces persistent challenges, including underfunding and resource limitations. These constraints hinder the implementation of comprehensive obesity management programs.

Government policies play a crucial role in shaping public health initiatives. While Greece has taken steps to align with EU directives on health promotion, such as encouraging physical activity and improving nutritional labeling, the effectiveness of these measures is often undermined by inconsistent enforcement and lack of adequate funding. Additionally, there is limited political prioritization of obesity as a public health crisis, despite its growing prevalence and association with chronic diseases such as diabetes and cardiovascular conditions.

Economic factors also intersect with political decisions to affect obesity management. Greece's prolonged economic crisis has exacerbated health inequalities, reducing access to quality healthcare and preventive services for vulnerable populations. Public spending on health, including obesity prevention programs, has been constrained, leaving significant gaps in education campaigns and community support initiatives.

Cultural and social influences further complicate political responses to obesity. Traditional Greek diets, often regarded as models of health, are increasingly replaced by processed and high-calorie foods due to globalization and urbanization. Policies targeting food marketing, particularly to children, remain insufficiently robust.

Table 2: Political Factors Affecting Obesity Management in Greece

1	Government political commitment significantly influence obesity management efforts
2	Government policies play a crucial role in shaping public health initiatives
3	Government policies targeting food marketing particularly to children remain inefficient
4	Government policies regarding public spending for obesity prevention programs have been restrained partly due to the recent economic crisis
5.	Political decisions are interrelated with economic factors and cultural and social influences to affect obesity management

6.2 Economic Factors Affecting Obesity Management in Greece

Economic factors play a significant role in shaping the management of obesity in Greece, influencing healthcare resources, public access to nutrition, and the broader societal approach to preventive health measures. Greece's prolonged economic crisis, which began in 2009, has left lasting impacts on its healthcare system and the population's ability to access obesity prevention and management services.

One key challenge is reduced public spending on healthcare. Greece allocates a relatively small portion of its GDP to health services compared to other EU countries. This underfunding affects the availability of specialized programs for obesity management, such as nutritional counseling, exercise therapy, and bariatric surgery. Primary care services are often overstretched, leaving little room for comprehensive obesity prevention initiatives.

Economic disparities also exacerbate the prevalence and management of obesity. Low-income households, particularly in urban areas, are more likely to consume cheaper, calorie-dense, and nutrient-poor foods. These choices are driven by affordability rather than health, perpetuating a cycle of poor dietary habits and increased obesity rates. The financial strain also limits participation in physical activities, as gym memberships and organized sports can be prohibitively expensive.

Another economic factor is the country's food environment. While Greece has a rich tradition of healthy Mediterranean eating, economic pressures have contributed to a shift toward processed and imported foods, which are often more affordable but less nutritious. The lack of strong regulatory policies to control the marketing and pricing of unhealthy foods further compounds the issue.

Table 3: Economic Factors Affecting Obesity Management in Greece

1.	Reduced public spending and underfunding of obesity
2.	Low-income households particularly in urban areas consume cheaper and nutrient-poor foods
3.	Economic disparities favor the prevalence of obesity. Economic pressures have contributed to the shift towards processed, unhealthy and cheap food instead of the traditional healthy Mediterranean diet.

6.3 Social Factors Affecting Obesity Management in Greece

Social factors play a critical role in influencing obesity management in Greece, encompassing dietary habits, cultural traditions, urbanization, and public awareness. These factors shape both the prevalence of obesity and the effectiveness of efforts to combat it.

Traditional Greek culture is rooted in the Mediterranean diet, widely regarded as one of the healthiest dietary patterns in the world. However, societal changes, including urbanization and globalization, have led to a significant departure from this diet. Processed, calorie-dense foods and sugary beverages have become staples in many households, particularly in urban areas, where fast-paced lifestyles often prioritize convenience over nutrition.

Public awareness and attitudes toward obesity also influence management efforts. In many cases, obesity is viewed as a personal issue rather than a public health concern, which can stigmatize individuals and deter them from seeking professional help. The stigma surrounding obesity often undermines prevention and treatment efforts, as individuals may avoid accessing services for fear of judgment.

Social inequalities further exacerbate the challenge. Lower-income groups face greater barriers to adopting healthy lifestyles due to limited access to affordable, nutritious food and recreational facilities. These disparities are particularly evident in urban centers, where sedentary lifestyles are more prevalent, and opportunities for physical activity may be limited by space and safety concerns.

Moreover, Greece's strong food-centric culture, characterized by frequent social gatherings and celebrations, often emphasizes overeating, making it challenging to promote moderation and healthy choices.

Table 4: Social Factors Affecting Obesity Management in Greece

1	Traditional Greek culture is rooted in the Mediterranean diet considered as one of the healthiest diets in the world
2	Obesity is often viewed as a personal issue rather a public health concern which can stigmatize individuals
3	Lower-income groups face greater barriers to adopt healthy lifestyles
4	Greece's strong food-centric culture characterized by frequent social gatherings and celebrations often emphasizes overeating resulting in obesity

6.4 Technological Factors Affecting Obesity Management in Greece

Technological factors play an increasingly important role in obesity management in Greece, influencing prevention, treatment, and public awareness efforts. Advancements in health technology, digital platforms, and data analytics have created opportunities to address obesity more effectively, but certain barriers limit their full potential.

Digital health tools, such as mobile apps and wearable devices, are gaining traction in Greece as tools for tracking

physical activity, diet, and overall health. These technologies enable individuals to monitor their progress and maintain accountability. However, their adoption is uneven, particularly among older adults and lower-income groups who may lack access to smartphones or internet connectivity. Bridging this digital divide is critical to ensure equitable use of these technologies.

Telemedicine and online health consultations have also expanded, particularly in the wake of the COVID-19 pandemic. These services have improved access to nutritional counseling and weight management programs, especially in remote or underserved areas. However, the integration of telemedicine into the healthcare system remains limited, with challenges related to infrastructure, digital literacy, and reimbursement policies.

Technological advancements in healthcare, such as body composition analyzers and metabolic monitoring devices, have enhanced clinical approaches to obesity management. Yet, these tools are often available only in specialized centers, which limits their reach. Wider distribution and investment in these technologies could improve early detection and personalized treatment.

Additionally, social media and digital platforms play a dual role. While they can promote healthy lifestyles and disseminate evidence-based information, they also expose users to conflicting messages and misinformation about diet and weight loss, complicating public health efforts.

Table 5: Technological Factors Affecting Obesity Management in Greece

1	Digital health tools can be used for tracking physical activity, diet and overall health
2	Telemedicine and on-line health education can improve the access to nutritional counseling and weight management programs particularly in remote areas
3	Technological advancements as body composition analyzers and metabolic monitoring devices can improve obesity management
4	Social media and digital platforms play a dual role. They can promote healthy lifestyles and disseminate evidence-based information. However, they also expose users to mis-information about diet and weight loss

6.5 Environmental Factors Affecting Obesity Management in Greece

Environmental factors significantly influence obesity management in Greece, shaping individuals' lifestyle choices, dietary habits, and opportunities for physical activity. Urbanization, food accessibility, and the built environment all play critical roles in the prevalence of obesity and the effectiveness of interventions.

Urbanization has transformed Greece's living environments, particularly in major cities like Athens and Thessaloniki. Dense urban areas often lack green spaces, parks, and recreational facilities, limiting opportunities for physical activity. The increasing reliance on motorized transportation further reduces daily physical activity levels, contributing to sedentary lifestyles.

Food accessibility and availability are other critical factors. While Greece is known for its rich agricultural tradition and the healthy Mediterranean diet, the modern food environment often prioritizes convenience over nutrition. Fast-food outlets and supermarkets stocked with processed, calorie-dense foods are ubiquitous, especially in urban areas. These options are frequently more affordable than fresh, locally sourced produce, posing challenges for low-income

populations to maintain healthy eating habits.

Environmental sustainability issues also intersect with obesity management. The focus on convenience foods has increased the consumption of packaged and imported products, often at the expense of traditional, nutrient-rich Greek foods.

In rural areas, the challenges differ. While there may be greater access to fresh produce, physical activity can be limited by geographic isolation and reduced access to fitness facilities or organized sports.

Table 6: Environmental Factors Affecting Obesity Management in Greece

1.	There are limited opportunities for physical activities due to extensive urbanization and the reliance on motorized transportation
2.	Unhealthy highly processed cheap food is broadly available and it is often preferred than the healthy well-known Mediterranean diet
3.	In rural areas there is limited access to fitness facilities and organized sports

6.6 Legal Factors Affecting Obesity Management in Greece

Legal factors play a pivotal role in shaping obesity management in Greece, influencing food regulation, public health policies, and access to healthcare services. While Greece has made strides in aligning with European Union (EU) regulations, significant gaps remain in the legal framework addressing obesity prevention and treatment.

One key legal factor is the regulation of food marketing and labeling. As a member of the EU, Greece follows its directives on nutritional labeling, which aim to inform consumers about the caloric and nutritional content of packaged foods. However, enforcement of these regulations can be inconsistent. Additionally, laws to restrict the marketing of unhealthy foods, particularly to children, are not as robust as in some other EU countries. This lack of stringent controls contributes to unhealthy dietary patterns, especially among vulnerable populations.

Another legal challenge is the limited implementation of taxation policies targeting unhealthy food and beverage consumption. While some countries have introduced sugar taxes to discourage the consumption of sugary drinks and snacks, Greece has yet to adopt similar measures.

Healthcare access is another area influenced by legal factors. Greek law ensures universal healthcare coverage, but systemic inefficiencies and resource limitations create barriers to accessing specialized obesity treatment, such as bariatric surgery or structured weight management programs.

Workplace regulations and labor laws also impact obesity management. For instance, legal mandates encouraging work-life balance, such as provisions for physical activity or healthy meals at work, are limited.

Table 7: Legal factors affecting obesity management in Greece

1	Better regulation of food marketing and labelling
2	Restrictions in marketing unhealthy foods particularly to children
3	Lack of taxation policies to discourage the use of unhealthy sugary drinks and snacks
4	Limited healthcare coverage regarding specialized obesity treatment including bariatric surgery
5	Lack of workplace regulations providing physical activity and healthy meals at work

7. Discussion

The use of Chat GPT in obesity management in Greece using PESTEL analysis has been studied. An important consideration for using PESTEL analysis based on Chat GPT instead of the traditional PESTEL analysis is the time. A detailed PESTEL analysis requires a lot of time and effort examining all six dimensions while the use of Chat GPT implements the analysis quickly with lower cost. The PESTEL methodology examines only the external environment. The additional use of SWOT analysis will give an insight to the internal environment offering a more detailed and holistic approach in this issue. The answers of Chat GPT have been used in PESTEL analysis instead of asking policy makers and several experts about this issue. In our work PESTEL analysis examines the external factors which influence the obesity management in the country and should be taken into account in the future. Chat GPT has analyzed the political, economic, social, technological, environmental and legal factors which affect the obesity management in Greece. Its answers should be used complementing the human analysis. Among the environmental factors already mentioned, climate crisis should be also considered since it increases the obesity rates. Among the political factors already mentioned, the lobbying of food companies to the government for the promotion of their processed unhealthy food products which increase the rate of obesity in Greece should be also considered.

The accuracy of answers of Chat GPT depends on its training related to recent scientific advancements and probably they do not include the latest developments in this field. Further research should be focused in the implementation of PESTEL analysis asking policy makers, medical experts and other stakeholders of the obesity treatment industry to fill proper questionnaires and compare their answers with the answers of Chat GPT.

8. Conclusions

A PESTEL analysis regarding the obesity treatment in Greece focusing on the external factors affecting the management of the pandemic has been implemented. PESTEL analysis is a valuable tool for understanding the external macro-environment and its potential impacts on an organization. When employed thoughtfully, PESTEL analysis can provide significant strategic advantages while helping organizations navigate complex external environments. Instead of using the opinion of experts and stakeholders of the obesity treatment industry, which is time consuming and costly, the opinion of Chat GPT was asked and its answers were analyzed. Chat GPT has identified the political, economic, social, technological, environmental and legal factors affecting obesity management in Greece. The quick response of Chat GPT was satisfactory although some additional points have been proposed which were not included in the analysis. The use of Chat GPT in several sectors including in healthcare has some limitations related with its training particularly in recent scientific advancements and information. In our study its answers regarding the impacts of the external environment in obesity treatment in Greece are useful. They can be used by policy makers, healthcare experts and several stakeholders of the obesity management industry in Greece. However, they should be enriched with further human analysis.

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