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Obesity Management and the Achievement of Sustainable Development Goals in Greece

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Abstract

Overweight and obesity consists of a severe global pandemic having harmful and undesired health, social and economic impacts. Obesity management is not included in the seventeen Sustainable Development Goals of UN which should be achieved by 2030 according to the international agreement signed in the global summit for climate change in 2015 in Paris. The problem of obesity is severe in Greece where many children and adults are overweight and obese. The achievement of SDGs in Greece has been monitored indicating that, in 2022, their achievement was not satisfactory and more efforts are required to reach in the desired targets by 2030. Many international studies have indicated that obesity treatment is indirectly related with the achievement of several UN SDGs. Other studies in various countries have indicated that education is negatively related with obesity while education is one available tool for fighting the harmful pandemic. Similar studies in Greece are limited while appropriate policies focusing simultaneously in obesity reduction and in the achievement of the UN SDGs are lacking. The development of new policies in Greece targeting jointly in obesity reduction and the achievement of the SDGs could be useful having many health, social, economic and environmental benefits. The development of educational material for treating overweight and obesity could contribute in the mitigation of the obesity pandemic in Greece.

Keywords: Education, Greece, Obesity Management, Overweight Treatment, Sustainable Development Goals

1. Introduction

The achievement of the United Nations' (UN) Sustainable Development Goals (SDG) for 2030 has been agreed in the international summit for Climate Change in Paris in 2015. The progress in the achievement of the abovementioned goals has been monitored and assessed in several studies (*Thakur et al, 2021, The progress of the Greek regions in relation to the SDGs, 2022, Bastos et al, 2021*) [22, 24, 1]. Although the problem of the global pandemic of obesity and its treatment has not been included in the 17 SDGs of UN its linkage with many of them has been proved. (*Bordoni, 2023, Ralston et al, 2021, Lobstein et al, 2020, Tarsitano et al, 2019*) [2, 19, 12, 21]. The obesity and its harmful consequences in Greece have been analyzed (*Georgakopoulos, 2022, Kassari et al, 2018, Genitsaridi et al, 2020*) [7, 11, 6]. Several studies worldwide indicate that obesity is negatively related with education (*Devaux et al, 2011, Sart et al, 2023, Hsieh et al, 2020)* [4, 20, 9].

The aim of the present work is to study the obesity treatment and the achievement of the SDGs in Greece as well as the linkages between them. Additionally, to examine the role of education in obesity management.

The text is structured as follows: After the literature survey the problem of obesity and the achievement of the 17 SDGs of UN in Greece are analyzed. In the next two sections the obesity treatment and the impacts in the achievement of SDGs in Greece as well as the role of education in obesity management are examined. The text ends with discussion of the findings, the conclusions drawn and the citation of the references used.

Taken into account the lack of similar studies in Greece the current research is innovative covering the existing gap regarding the interrelation of obesity treatment with the achievement of the 17 SDGs of UN. The findings could be useful to policy makers and to public authorities who develop appropriate policies for managing obesity in Greece and promoting the achievement of SDGs.

2. Literature survey

Bordoni, 2023 [2] has studied the water footprint of the recommended Italian diet. The author stated that it is necessary to shift towards diets which are both nutritious and sustainable with low environmental impacts achieving the United Nations Sustainable Development Goals regarding food security (SDG2) and water security (SDG6). She mentioned that the proposed Italian diet guidelines have a low water footprint while its further reduction by replacing animal food with plant food is limited because the suggested consumption of animal food is already low. *Medori et al, 2023* have studied the achievement of SDGs using the Mediterranean diet (MD). The authors analyzed the significance of a plant-based diet, particularly its contribution in attaining the UN SDGs. They stated that MD emerges as the most suitable dietary option for achieving sustainable development. *Tarsitano et al, 2019* have studied the MD model to achieve the 2030 agenda of SDGs. The authors stated that the notion of "*Mediterranean diet*" is understood as "*eating well and stay well*". They also mentioned that MD is conceived as a peculiar Medieterranean life style, a specific modality of production and consumption of food and a unique relation between people and the environment. *Lobstein et al, 2020* [12] have studied the points at which obesity is affected by the UN SDGs. The authors stated that at least 14 out of 17 thematic SDGs affect obesity epidemic including health, food, education, water quality, land and ocean quality, urbanization and employment. They also mentioned that obesity is a recuring theme and an acute global health crisis that the SDGs are well-placed to address. *Ralston et al, 2021* have investigated how addressing obesity is vital in achieving several SDGs. The authors stated that obesity is an important and essential component of the global development agenda while SDGs offer a multi-faceted pathway to address obesity across multiple factors. *World Health Organization, 2017* has analyzed the UN SDG targets related with the reduction of premature mortality from noncommunicable diseases (NCDs) through prevention and treatment promoting mental health and well-being. The analysis stated that four main NCDs are associated with a cluster of common risk factors including tobacco and alcohol use, unhealthy diets, physical activity, hypertension, obesity, and environmental factors. It is also mentioned that at least 80% of the heart disease, stroke and diabetes could be prevented by tackling these major risk factors. *Georgakopoulos, 2022* [7] has analyzed obesity and its consequences in Greece. The author stated that children's obesity is an acute phenomenon in Greece which ranks first among EU countries while the country is also on top positions in adults' obesity. He also mentioned that obesity, which is the result of the positive energy balance in human bodies, creates many severe health problems both in childhood and in adulthood while its social and economic consequences cannot be ignored. *Boto et al, 2022* have reviewed the sustainability dimensions of the Mediterranean diet. The authors examined several indicators including ten environmental indexes to assess the Mediterranean diet. They mentioned that it has lower environmental impacts than western diets showing a carbon footprint between 0.9 $kgCO_2$ and 6.88 $kgCO_2$ per capita per day, a water footprint between 600 m^3 and 5,280 m^3 per capita per day and an ecological footprint between 2.8 m^2 and 53.42 m^2 per capita per day. *Dietz et al, 2022* have examined the necessity to mitigate global obesity, undernutrition and climate change. The authors have tried to identify dietary and transportation strategies that reduce GHG emissions and obesity focusing on USA. They also mentioned that Lancet commission of obesity has suggested 18 actions to simultaneously mitigate obesity, malnutrition and climate change globally. They defined the "*Sustainable diets*" as "*diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generation*". *The global syndemic of obesity, undernutrition and climate change has been studied in a Lancet commission report, 2019.* The report stated that these three pandemics – "obesity, undernutrition and climate change" – represent the global syndemic that affects most people in every country and region worldwide. It is also mentioned that the problem of obesity has four pillars: a) the prevalence of obesity is increasing in every region of the world, b) many evidence-based policy recommendations to halt and reverse obesity rates have been endorsed in many countries but have not been translated in meaningful and measurable change, c) the enormous health and economic burdens caused by obesity are not seen as urgent enough to implement effective treatment, and d) obesity has historically been considered in isolation from other major global challenges. *Underwood et al, 2015* have studied the climate co-benefits of obesity reduction. The authors used data for the fifty US states over the period 1997-2011 examining the relationship between the obesity rate and CO_2 emissions due to energy use. They mentioned that reversion of obesity rates in 1997 levels, from the levels of 2013, in USA could reduce the total annual CO_2 emissions due to energy use by 2.8%. The authors evaluated the annual climate benefits regarding the social cost of carbon in the range of 5.7 billion $ to 8.9 billion $. *Kassari et al, 2018* have developed a "*National registry for the prevention and management of overweight and obesity*" in Greece. The authors stated that the proposed system calculates a personalized therapeutic algorithm providing information on diet, physical exercise and sleep. They also mentioned that a pilot study in 1,270 children and adolescents resulted in a reduction in obesity rates by 30% and overweight rates by 35% within one year. *Genitsaridi et al, 2020* have studied a multidisciplinary obesity management plan which was effective in reducing the prevalence of overweight and obesity in children and adolescents. The authors stated that in Greece 30-35% of children and adolescents are overweight and obese. They implemented a pilot study with 1,000 children and adolescents who were receiving personalized advice on diet and exercise for one year. In the initial sample 57.9 % of the participants were obese, 29.5% overweight and 12.6% had normal Body Mass Index (BMI). They mentioned that after one year of treatment the prevalence of obesity among the participants was reduced by 16.8% while the prevalence of normal BMI was increased by 8.2%. *Papadopoulou et al, 2022* have studied the nexus between water-energy-land-food-climate for achieving the SDGs in Greece. The authors stated that emphasis should be given on smart water management and precision agriculture, capture of GHGs, increased use of renewable energies and protection of terrestrial ecosystems. *Bastos et al, 2021* have studied the impact of macro-social marketing for obesity management in achieving the UN SDGs focusing in Brazil. The authors stated that the target 3.4 of SDG3 highlights the need "to reduce by one-third

premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being" by the year 2030. They also mentioned that a holistic intervention at city level focusing on physical activity and healthful eating was successful in obesity treatment. *Thakur et al, 2021* have studied the progress towards the achievement of the target 3.4 of SDG3 to reduce premature NCD mortality by one-third by 2030. They mentioned that the target 3.4 of SDG3 is interrelated with at least nine SDGs while only 2 out of 10 NCD progress indicators are being met by at least half of the 176 countries who signed the international agreement for achieving the 17 UN SDGs. *The World Health Organization, 2021* has studied the relation among nutrition, overweight and obesity in EU countries. The study stated that diets rich in sodium, low in whole grains and low in fruits consumption accounted for more than half of all diet-related deaths. It is also mentioned that the prevalence of obesity is estimated to account for 10-13% of deaths in different parts of EU. More than 50% of adults are overweight and obese while this percentage in various EU countries is close to 70%. *The progress of the Greek regions in relation to the achievement of SDGs has been studied, 2022.* It is stated that no region has met the goals for SDG 1,2,4,7,8,9,10 and 16 while one region has already met the goals for SDG 3,5,6,7 and 15. It is also mentioned that two regions have already met the goal for SDG 14 while the regions of Attica, Southern Aegean and Crete should try harder to achieve the SDGs until 2030. *Mubbasher et al, 2022* have studied the correlation between education and obesity. The authors stated that there are strong negative correlations between global education and global obesity in medium, high and very high human development countries while in low human development countries the correlation is weak. *Sart et al, 2023* [20] have investigated the impact of education in obesity in adults focusing on BRICS. The authors stated that educational attainment has a negative influence on obesity in both adults, female and males while the influence is higher in females than in males. They also mentioned that the increase of educational attainment should be used as a policy instrument to decrease obesity. *Hsieh et al, 2020* explored the association between geriatric obesity and education level along with other demographic characteristics in Taipei, Taiwan between 2013 and 2015. A total of 28,092 men and 31,835 women > 65 years old were included in the final analysis. Compared to those with education years ≥16, older men and women with education years ≤12 had higher odds of being obese. The odds ratios increase as years of education decrease, and the trend is clearer among women. *Halefom Gezaei, 2023* has studied the role of education in achieving the 17 UN SDGs. The author stated that education for sustainable development can enable the achievement of the SDGs. He also mentioned that education was planned under SDG4 while it can play an important role in achieving the targets set in SDGs. *Mazariegos et al, 2021* have analyzed the educational inequalities in obese people in Latin America. The authors investigated the relation between obesity and educational level. They stated that among women 25% were obese while obesity was negatively linked with educational level. They also mentioned that among men 18% were obese and there was a positive relation between obesity and education level for men living in cities with lower level of development while for those living in cities with higher level of development education was protected of obesity. *Devaux et al, 2011* [4] have explored the relationship between educational level and obesity in several countries. The authors stated that there is a linear relationship between the number of years spent in full-time education and the probability of obesity, with most educated individuals displaying lower rates of overweight and obesity. This indicates that the strength of the correlation between education and obesity is approximately constant throughout the education spectrum. They also mentioned that increasing education at any point along that spectrum would be expected to reduce obesity to a similar degree, if the causal nature of the link between education and obesity had been established. The education gradient in obesity is stronger in women than in men.

3. The problem of obesity in Greece

Obesity in children and adults is one of the most challenging health problems of the 21st century in Greece and worldwide. Obesity is essentially a result of the body's positive energy balance. If the energy we acquire is greater than what we consume, this extra energy is stored in the body as fat. This phenomenon is particularly acute in Greece which ranks first in the EU in childhood obesity and also holds one of the top positions in adult obesity. According to World Health Organization (WHO) data from 2019 37.9% of Greek adults are overweight and 24.9% are obese (*Georgakopoulos, 2022*) [7]. The rates of obesity in children seem to be higher in rural areas than in cities while it is also interesting to note that in three-quarters of Greek families, at least one of the two parents is overweight or obese. In one out of four families, both parents are. However, there are various social, environmental as well as genetic factors that can increase the risk of developing this imbalance. The best-known factors, of course, have to do with the lifestyle of children and adults. Studies in Greece have indicated that the problem of obesity is multi-factorial while it is related to the lifestyle and personal choices made by families. How much and what kind of food we eat, whether we exercise or are physically active, and how much time we spend on "sedentary" activities dramatically affect the likelihood of gaining weight, regardless of other factors (*Georgakopoulos, 2022*) [7]. It has been also observed that in Greece only 25% of adults consume the recommended amounts of fruits and vegetables while 68% of Greek adults do not exercise at all and do not engage in any sport, which is the largest percentage in EU (*Georgakopoulos, 2022*) [7]. The increasing prevalence of overweight and obesity in Greece indicates that the current health policies are not effective. Obese and overweight patients are categorized according to their Body Mass Index (BMI). The Body Mass Index is defined as the ratio of weight to the square of height. The obesity rates in adults in Greece and Europe are presented in Table 1.

Table 1: Obesity rate in adults in Greece and in Europe

	Greece (%)	Europe (%)
Overweight (BMI = 25-30)	37.9	35.4
Obese (BMI>30)	24.9	23.3
Total	62.8	58.7

Source: Georgakopoulos, 2022

The increased number of obese and overweight people in Greece has significant undesired economic impacts. According to OECD data from 2019, obesity is responsible

for 9% of annual health expenditure. According to the same study, the annual Gross Domestic Product (GDP) in Greece during the period 2020-2050 will be 3% lower than otherwise, due to the economic consequences of obesity (*Georgakopoulos, 2022*) [7].

4. The 17 UN Sustainable Development Goals and their achievement by 2030 in Greece

The global leaders in 2015 in Paris adopted a common vision for sustainable development with seventeen goals and targets to be achieved by 2030. These goals and targets were adopted by national governments but with a clear recognition that regions and municipalities would play a crucial role in implementing these goals.

Moreover, the 2019 SDG Index and Dashboards for European Cities has produced the following five major findings:

1. No capital cities and large metropolitan areas in Europe have achieved the SDG's.
2. There are persistent challenges related to SDG12 (Responsible Consumption and Production), SDG13 (Climate Action) and SDG15 (Life on Land).
3. Decarbonizing transportation in cities and providing access to affordable housing remain major policy priorities.
4. Compared to the US Cities Index, better nutrition, diet and a more active life style in Europe drive higher performance on SDG 2 (No Hunger) and SDG 3 (Health and Well-Being).

Assessment of the thirteen Greek regions regarding the achievement of the seventeen UN SDGs has indicated that in a scale of the range 0-100 the score of the regions varies between 51.65% to 36.82% *(The progress of the Greek regions in relation to the sustainable development goals, 2022).* The regions of Thessaly and Ionian islands rank in the first two positions scoring at 51.65% and 49.60% while the regions of Sothern Aegean and Attica rank in the last two positions scoring at 39.08% and 36.82%.

The ranking of the 13 Greek regions regarding the achievement of the SDGs is presented in Table 2.

Table 2: Score ranking of the Greek regions regarding the achievement of the SDGs in 2022

Rank	Region	Score (Range 0-100)	Inhabitants
1	Thessaly	51,65	730,730
2	Ionian Islands	49,60	206,470
3	Eastern Macedonia and Thrace	47,37	606,170
4	Western Macedonia	46,72	282,120
5	Epirus	46,24	336,650
6	Peloponnese	43,96	581,980
7	Northern Aegean	43,02	197,810
8	Central Greece	42,55	546,870
9	Western Greece	41,00	680,190
10	Central Macedonia	40,29	1,874,590
11	Crete	40,04	621,340
12	Southern Aegean	39,08	308,610
13	Attica	36,82	3,812,330

Source: The progress of the Greek regions in relation to the Sustainable Development Goals, 2022, Wikipedia

Countries located in Mediterranean region face several common challenges while they have some similar characteristics related with the specific geographical area. Taking into account their specific Mediterranean-related characteristics the achievement of SDGs in these countries should follow a roadmap presented in Table 3.

Table 3: How to achieve the Sustainable Development Goals in the Mediterranean area

1.	Promote sustainable farming systems under environmental and climate constraints
2.	Take care of water resources and fisheries management
3.	Develop appropriate food value chains for regional and local development
4.	Reduce food waste and enhance by-products innovation
5.	Promote sustainable tourism
6.	Promote sustainable nutrition and education for all

Source: Tarsitano *et al*, 2019

5. Obesity treatment and the impacts on achievement of SDGs in Greece

The Food and Agriculture Organization (FAO) of United Nations has suggested that humanity needs "sustainable diets with low environmental impacts". Therefore, the shift to diets, like the Mediterranean diet, which are both nutritious and sustainable is needed to achieve the UN SDG2 on food security and SDG6 on water security (*Bordoni, 2023*) [2]. The shift from western-type diets to Mediterranean dietary patterns contributes positively to obesity treatment. In fact, the management of obesity complies with the achievement of several SDGs (*Lobstein et al, 2020*) [12], including: SDG1: End of poverty in all its forms everywhere, in SDG2: End hunger, achieve food security and improve nutrition and promote sustainable agriculture, in SDG3: Ensure healthy lives and promoting well-being, in SDG6: Ensure availability and sustainable management of water and sanitation for all, SDG12: Ensure sustainable consumption and production patterns, in SDG13: Take urgent action, to combat climate change and its impacts, and in SDG15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainable manage forests, combat desertification, halt reverse land degradation and biodiversity loss. Current studies indicate that there is a clear decline in EU in premature non-communicable disease deaths since the mid-2000s. In parallel, the UN SDG targets for 2030 are on the way to be achieved (*World Health Organization, 2017*) [16]. Several UN SDGs which can be easier achieved with obesity and overweight treatment are presented in Table 4.

Table 4: Several UN SDGs which can be easier achieved with obesity and overweight treatment

Sustainable Development Goal of United Nations	Description
SDG1	End of poverty
SDG2	End hunger, achieve food security, improve nutrition and promote sustainable agriculture
SDG3	Ensure healthy lives and promoting well-being
SDG6	Ensure availability and sustainable management of water
SDG12	Ensure sustainable consumption and production patterns
SDG13	Combat climate change and its impacts
SDG15	Promote sustainable use of terrestrial ecosystems, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Source: Several authors

6. The role of education in obesity management

It has been indicated in several studies (*Sart et al, 2023, Mazariogos et al, 2021*) [20, 13] that educational level and obesity are mutually interrelated and interconnected. Adults, including females and males, with higher educational level have low odds being obese or overweigh. The trend is clearer in women than men. The positive relation between obesity and education level is higher for men living in cities with lower level of development while for those living in cities with higher level of development education was protected of obesity. Existing studies indicate that increasing education by one year in the whole population would decrease the overall obesity rate by 4% in Canada, and up to 9% in England (*Devaux et al, 2011*) [4]. Apart from the individual educational level the educational level of the other family members affects the probability of being obese. Existing studies in Greece propose an action plan for treating obesity based on two priorities: a) on the one hand, the design and the implementation of a school intervention program, to promote healthy eating and increased physical activity for children and their families, and b) on the other hand the planning and implementation of a simple process for the timely identification of families at high risk of obesity and its accompanying diseases (*Georgakopoulos, 2022*) [7]. Taking into account that the problem of obesity is due to so many complementary factors, many of which are related to the lifestyle and personal choices made by families facing different and sometimes very difficult situations and challenges, it would be very difficult to find a general and straightforward solution to this issue. The last decades various information and obesity prevention programs have been implemented in a number of countries around the world. These included information drives for children and parents and various forms of interventions in schools and in families, some of which have had measurable and significant results. Although several studies indicate that the correlation between education and obesity is of a causal nature conclusive proof of this does not yet exist (*Devaux et al, 2011*) [4].

7. Discussion

The obesity pandemic and the achievement of SDGs in Greece as well as the linkages between them have been studied. Additionally, the role of education in obesity management has been examined. The interrelation between obesity management and the achievement of the UN SDGs for 2030 has been indicated in several international studies as well as the positive contribution of education in the reduction of obesity. Existing studies regarding the interrelation of overweight and obesity management in Greece with the achievement of several SDGs of UN are limited so far. Additionally, studies regarding the role of education in obesity management are also limited in the country. However, the results of the existing international research clearly indicate the interrelation between obesity management and the achievement of SDGs as well as the positive role of education in obesity reduction. Our work could be useful to public authorities and policy makers in Greece who can develop appropriate policies and measures focusing jointly in reducing obesity and promoting the achievement of UN SDGs. It should be noted that there are not published studies in Greece related to existing linkages between obesity management and the achievement of UN SDGs. Therefore, our findings should be enriched in the near future with additional experimental studies and data in order to have more concrete results. Future research should be focused in the development of an adults' educational curriculum using distant learning techniques which could be useful in obesity management. Additionally, the achievement of SDGs in Greece should be monitored and reported more frequently. It is also suggested that appropriate policies targeting both in obesity reduction and in achievement of the UN SDGs should be developed and implemented in the country.

8. Conclusions

The linkage and interrelation between obesity management and the achievement of the UN SDGs for 2030 has been proved according to existing studies in several countries. The positive role of education in obesity reduction has been also proved. Obesity in children and adults consists of a severe problem in Greece as well as in other countries with undesired and harmful health, social and economic consequences. Several policies have been developed for managing overweigh and obesity in Greece which, taking into account the results, are not so far effective. Studies in several countries worldwide indicate that education has positive impacts in obesity reduction particularly among women. However, this fact has not been confirmed so far for Greece. According to existing studies the degree of achieving the 17 SDGs in the 13 regions in Greece in 2022 varies in the range of 36.82% to 51.65%. However, in highly populated regions, like Attica, the degree of achieving the UN SDGs is rather low. Therefore, significant efforts should be made for reaching the desired targets in the country by 2030. Obesity consists of a global pandemic with many harmful impacts. However, its reduction has not been included in the 17 SDGs of UN for 2030. It has been indicated though that the achievement of many SDGs is indirectly connected with obesity management and consequently both of them are linked and interconnected. Conclusively, the development and implementation of appropriate policies which should simultaneously target in obesity reduction and in the achievement of the UN SDGs are urgently required in Greece. Additionally, the development of educational programs focusing on obesity reduction in children and adults are also needed in the country.

9. References

1. Bastos A, Veludo-de Oliveira T, Yani-de-Soriano M, Atalla M, Gualano B. Leveraging macro-social marketing to achieve sustainable development goals: A city-wide intervention addressing obesity in Brazil. Journal of Social Marketing, 2021. Doi: 10.1108/JSOCM-09-2020-0187
2. Bordoni A. Insight into the Sustainability of the Mediterranean Diet: The Water Footprint of the Recommended Italian Diet. Nutrients. 2023; 15:2204. Doi: https://doi.org/ 10.3390/nu15092204
3. Boto JM, Rocha A, Migueis V, Meireles M, Neto B. Sustainability dimensions of the Mediterranean diet: A systematic review of the indicators used and its results. Advanced Nutrition. 2022; 13:2015-2038. Doi: https://doi.org/10.1093/advances/nmac066
4. Devaux M, Sassi F, Church J, Ceccini M, Borgonovi F. Exploring the Relationship Between Education and Obesity. OECD Journal: Economic Studies. 2011; 1.

Doi: https://doi.org/10.1787/eco_studies-2011-5kg5825v1k23
5. Dietz WH, Pryor S. How can we act to mitigate the global syndemic of obesity, undernutrition and climate change. Current Obesity Reports. 2022; 11:61-69. Doi: https://doi.org/10.1007/s13679-021-00464-8
6. Genitsaridi SM, Giannios C, Karampatsou S, Papageorgiou I, Papadopoulos G, Farakla I, *et al*. A Comprehensive Multidisciplinary Management Plan Is Effective in Reducing the Prevalence of Overweight and Obesity in Childhood and Adolescence. Hormone Research in Pediatrics. 2020; 93(2):94-107. Doi: 10.1159/000507760.
7. Georgakopoulos Th. Obesity and its consequences, Dianeosis - Research and Policy Institute, 2022. Retrieved from: https://www.dianeosis.org/en/2022/04/obesity-and-its-consequences/
8. Halefom Gezaei A. The role of education in achieving the sustainable development goals (SDGs): A global evidence-based research article. International Journal of Social Science and Education Research Studies. 2023; 3(1):67-81. Doi: https://doi.org/10.55677/ijssers/V03I1Y2023-09
9. Hsieh T-H, Lee JJ, Yu E-W, Hu H-Y, Lin S-Y, Ho C-Y. Association between obesity and education level among the elderly in Taipei, Taiwan between 2013 and 2015: A cross-sectional study. Nature Research Scientific Reports. 2020; 10(1):20285. Doi: 10.1038/s41598-020-77306-5. PMID: 33219305; PMCID: PMC7680111.
10. https://en.wikipedia.org/wiki/Regions_of_Greece
11. Kassari P, Papaioannou P, Billiris A, Karanikas H, Eleftheriou S, Thireos E, *et al*. Electronic registry for the management of childhood obesity in Greece. European Journal of Clinical Investigation. 2018; 48(3):e12887. Doi: 10.1111/eci.12887.
12. Lobstein T, Cooper K. Obesity: A ghost at the feast of the sustainable development goals. Current Obesity Reports. 2020; 9:470-478. Doi: https://doi.org/10.1007/s13679-020-00405-x
13. Mazariogos M, Aachincloss AH, Braverman-Bronstein A, Kroker-Lobos MF, Ramirez-Zea M, Hessel P, *et al*. Educational inequalities in obesity: A multilevel analysis of survey data from cities in Latin America. Public Health Nutrition. 2021; 25(7):1790-1798. Doi: https://doi.org/10.1017/S1368980021002457
14. Medori MC, Donato K, Stuppia l, Beccari T, Dundar M, Marks RS, *et al*. Achievement of sustainable development goals through the Mediterranean diet. European Review for Medical and Pharmacological Sciences. 2023; 27:89-99. Doi: https://doi.org/10.26355/eurrev_202312_34693
15. Mubbasher M, Zahrahtul AZ, Atif AB, Mumtazimah BM. Development of global education index and establish relationship with human obesity through human development levels clustering. International Journal of Special Education. 2022; 37(3):14530-14551.
16. Noncommunicable diseases. World Health Organization, Regional Office for Europe, 2017. Retrieved from: https://iris.who.int/bitstream/handle/10665/340830/WHO-EURO-2018-2366-42121-58038-eng.pdf?sequence=1
17. Nutrition. Overweigh and obesity, Factsheets – Sustainable Development Goals: Health Targets, World Health Organization, 2021. Retrieved from: https://iris.who.int/bitstream/handle/10665/341982/WHO-EURO-2021-2574-42330-58595-eng.pdf?sequence=1
18. Papadopoulou CA, Papadopoulou MP, Laspidou C. Implementing Water-Energy-Land-Food-Climate Nexus Approach to Achieve the Sustainable Development Goals in Greece: Indicators and Policy Recommendations. Sustainability. 2022; 14:4100. Doi: https://doi.org/10.3390/ su14074100
19. Ralston J, Cooper K, Powis J. Obesity, SDGs and ROOTS: A framework for impact. Current Obesity Reports. 2021; 10:54-60. Doi: https://doi.org/10.1007/s13679-020-00420-y
20. Sart G, Bayar Y, Danilina M. Impact of educational attainment and economic globalization on obesity in adult females and males: Empirical evidence from BRICS economies. Frontiers in Public Health. 2023; 11:1102359. Doi: 10.3389/fpubh.2023.1102359
21. Tarsitano E, Calvano G, Cavalcanti E. The Mediterranean way a model to achieve the 2030 agenda sustainable development goals (SDGs). Journal of Sustainable Development. 2019; 12(1):108-119. Doi: 10.5539/jsd.v12n1p108
22. Thakur JS, Nangia R, Singh S. Progress and Challenges in achieving noncommunicable diseases targets for the sustainable development goals. FASEB BioAdvances. 2021; 3:563-568. Doi: 10.1096/fba.2020-00117
23. The global Syndemic of obesity, undernutrition and climate change: The Lancet Commission Report. 2019; 393:791-846. Doi: http://dx.doi.org/10.1016/ S0140-6736(18)32822-8
24. The progress of the Greek regions in relation to the sustainable development goals (SDGs), Athens University of Economics and Business, Working Paper Series, 2022. Retrieved from: https://wpa.deos.aueb.gr/docs/2022.Greek.Regions.SDG.pdf
25. Underwood A, Zahram S. The climate co-benefits of obesity reduction. Environmental Science Economics, 2015. Corpus ID: 44290852