

A Scoping Review of the Biological, Socioeconomic and Environmental Determinants of Overweight and Obesity Among Middle Eastern and Northern African Nationalities

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ABSTRACT: Objectives: Globally, and particularly in the Middle East and North Africa (MENA) region, overweight and obesity have become serious public health concerns. This scoping review aimed to identify and summarise the available data on the determinants of overweight and obesity among MENA nationalities. **Methods:** An extensive search of electronic databases, including Google Scholar, PubMed and ProQuest, for articles published from 2007 until 2022 was conducted. A total of 10 articles, of the 333 that were found in the original search, met the inclusion criteria. Data extraction and quality assessment were applied to each of the selected studies. **Results:** There is an intricate interplay of anthropometric, behavioural, sociodemographic and environmental factors that caused overweight and obesity in this population. **Conclusions:** A thorough synthesis of the factors influencing overweight and obesity in MENA nationalities was provided by this scoping review.

Keywords: Overweight; Obesity; Body Mass Index; Saudi Arabia; Oman.

ACCORDING TO THE WORLD HEALTH Organization (WHO), more than 1.9 billion individuals aged 18 and above were overweight in 2017; of these, 650 million individuals were obese.^{1,2} The WHO defines overweight for adults as a body mass index (BMI) of greater than or equal to 25 kg/m² and obesity for adults as a BMI greater than or equal to 30 kg/m². The term obesity refers to “a disease process characterised by excessive body fat accumulation with multiple organ-specific consequences.”³

Changes in dietary patterns, socioeconomic circumstances, demographics, physical activity levels and multiple pregnancies are some of the variables that contribute to the incidence of obesity in Arabic-speaking nations.⁴ Both industrialised and emerging nations have reported an increase in obesity prevalence.⁵ A study from Ethiopia have shown that overweight and obesity can be predicted by female sex, literacy and a history of hypertension.⁶ Overweight and obesity have increased from 1970’s to date in the Gulf States, including Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE).⁷ Historically, the Arab culture has associated being overweight or obese with wealth and prosperity for men and fertility for women.⁷ However, this perception has changed, and obesity is currently acknowledged as a serious health issue and a known risk factor for major comorbidities.⁸

According to the Global Obesity Observatory, Oman has the 60th highest prevalence of obesity in the world. The country ranks 38th for the prevalence of obesity in adult females, and 34.97% of Omani women are considered obese.⁹ In Saudi Arabia, 20,000 deaths

each year occur due to obesity-related diseases.¹⁰ With overweight and obesity among the most preventable causes of mortality and morbidity, Gulf states spend billions of riyals annually to fight the burden of these diseases.¹¹

The period from 18–25 years of age marks the transition from adolescence to adulthood. Earlier, obesity predominantly affected middle-aged adults; however, there is now a steady increase of obesity among young adults, particularly among college and university students.¹² Young adults around the world face significant lifestyle changes during this transition stage, such as leaving home and beginning college or university.¹³ During this stage, a sense of loss can be felt that often leads to time displacement, identity confusion and a distance from familiar contexts.¹⁴ At this life stage, people are at greater vulnerability to imbalances in energy expenditure that often result in weight gain. Such weight gain may appear less concerning for young adults than for older individuals, but it may have consequences later. Risky behaviours may stem from the combination and interaction of social, psychological and biological factors that transpire during these vulnerable years.¹⁵ Given the increasing rates of obesity among young adults in the Middle East and North Africa (MENA) region, it is important to develop effective public health strategies to address the issue. This review aimed to identify the determinants of overweight and obesity among MENA nationals. Furthermore, the purpose of this literature review was to synthesise the available evidence on the determinants of overweight and obesity in MENA populations to serve as a baseline for future research.

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Methods

SCOPING LITERATURE REVIEW

A literature review is similar to textual or narrative synthesis, with the aim of extracting as much relevant material as possible from each piece of literature, including technique, findings and variables.¹⁶ This study implemented a scoping literature review, which provides a high-level overview of relevant research accomplishments to date. This form of evaluation can identify a field's conceptual boundaries, quantify the pool of available research evidence and determine the categories of available evidence and any research gaps.

LITERATURE IDENTIFICATION

The databases Google Scholar (Google, California, USA), PubMed (National Library of Medicine, Maryland, USA) and ProQuest (ProQuest, Michigan, USA) were searched using terms such as 'Overweight', 'Obesity' and 'MENA Nationalities' [Figure 1]. The preliminary relevance of each manuscript, namely, if the content appeared to discuss overweight and obesity among young adults, was determined from the title. If deemed relevant, the full reference including the author, year, title and abstract was obtained for further evaluation.

INCLUSION CRITERIA

Studies that were conducted in a population of MENA origin, studies published in the English language with a primary focus on overweight and

obesity were included. Studies examining diverse drivers of overweight and obesity such as biological, socioeconomic and environmental factors, were included. The analysis included both quantitative and qualitative investigations. All articles with a publication date between 2007 and 2022 were taken into consideration.

EXCLUSION CRITERIA

A number of studies were excluded due to predetermined standards. Research undertaken prior to 2005 was not included in the analysis. Meta-analyses and systematic reviews were also excluded from the analysis. These exclusion criteria were developed to ensure the chosen studies were pertinent to and appropriate for the research purpose.

QUALITY AND ELIGIBILITY ASSESSMENT

The researchers screened the full text of the articles to further evaluate the quality and eligibility of the studies. Studies that were published in reputable journals and books were included. Most online presentations and technical reports were excluded from the review due to a lack of peer review. The quality and eligibility assessment was performed independently by two researchers in parallel. Any discrepancies in the findings were resolved through discussion. A Critical Appraisal Skills Programme checklist was used to assess the quality of the studies.

SEARCH OUTCOMES

The titles and aims of 1,300 non-duplicate articles retrieved from the database searches were screened as part of the preliminary identification procedure. A preliminary abstract evaluation resulted in the exclusion of 967 articles. This was followed by a thorough screening of the remaining articles. The articles were sorted by year of publication from 2007 to 2022, with older content automatically excluded. Also, only quantitative and qualitative studies were screened; systematic reviews and meta-analyses were not. This resulted in 333 articles published in English. Full-text screening was utilised to narrow down the inclusion criteria and ensure that the articles focused on the pre-identified factors. At this stage, 202 articles were excluded on the basis of not meeting the pre-identified determinants in their full text of which 120 were excluded because they tackled obesity and its co morbidities, 58 were about obesity and its challenges, 10 were about expatriates obesity in the GCC, 14 articles evolved around diet management of obesity and the remaining 10 articles that tackled the determinants of obesity in the MENA and GCC region were included in the review [Figure 2].

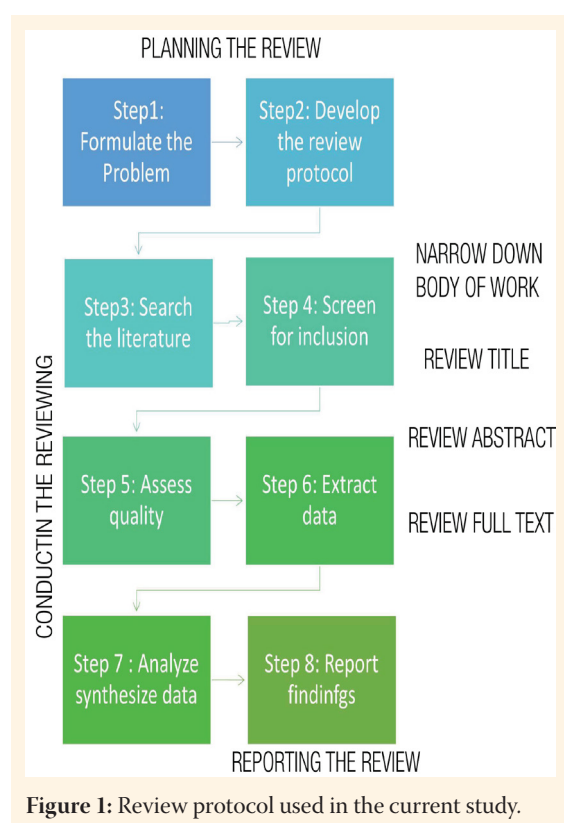


Figure 1: Review protocol used in the current study.

DATA EXTRACTION AND ANALYSIS

The research team coded the articles. A uniform code was decided upon, and each researcher assigned to the data extraction task used a summary table for each identified variable. Two researchers independently coded the studies. The researchers reviewed each study in its entirety to provide context about the study and avoid deviating from the focus of the original paper. Data were synthesised using tables to cluster the findings according to research designs and techniques and quantitative and qualitative studies. The findings were presented separately and combined in a narrative synthesis [Tables 1 and 2].

REPORTING

To ensure the quality of literature included in the review, A Measurement Tool to Assess Systematic Reviews checklist was used to identify research that adhered to the suggested standards.¹⁷

Discussion

Globally, and particularly among MENA and Gulf Cooperation Council (GCC) countries, overweight and obesity have emerged as serious public health issues. In the MENA and GCC regions, the prevalence of overweight and obesity has risen rapidly. These regions have some of the highest obesity rates worldwide.¹⁸ For instance, the obesity prevalence among adults in Saudi Arabia was calculated to be

68.2%, while 37.2% of people in the UAE are reported to be overweight or obese.^{19,20} Due to a variety of biological, socioeconomic and environmental factors that encourage an obesogenic environment, overweight and obesity have become more common in the MENA region.¹⁵

The review identified three studies that discuss the biological determinants of overweight and obesity in MENA nations. El Hajj Chehadeh *et al.* examined the role of genetic variations in the UAE's young Arab population's vulnerability to overweight and obesity.²¹ The researchers aimed to pinpoint particular genes or genetic variations causing a higher risk of overweight or obesity in the young people of the UAE by examining genetic variants. Understanding the genetic components at play can help in better understanding the molecular processes that underlie obesity in the Arab community. This work advances the understanding of the genetic factors that drive obesity and may help in the creation of focused strategies for the management and prevention of obesity.

Labban and Al-Kilani *et al.* analysed the BMI distribution of university students in Oman and examine the prevalence of overweight and obesity among them.^{22,23} The findings offer insights into the biological causes of obesity in Omani young adults. A cross-sectional study by Al-Ghamdi *et al.* determined the prevalence of overweight and obesity by BMI in Alkharj, Saudi Arabia.²⁴ These studies highlight the importance of developing personalised activities and interventions that target individuals with a higher genetic predisposition to obesity. This is made possible by understanding the genetic variations linked to overweight and obesity as well as the demographic makeup of both the overweight and obese populations. Although there is no single 'biological determinant' of overweight and obesity, there are a number of biological characteristics that may put MENA populations at higher risk of these conditions. It is crucial to remember that these groups exhibit substantial variability, which means that the prevalence and influence of these characteristics may differ.

In the context of socio-cultural determinants of overweight and obesity, Kahan examined the sociodemographic aspects of overweight among Middle Eastern American college students.²⁵ A sedentary lifestyle, which is defined by little physical activity and a greater reliance on technology, is identified as one of the most significant causes of overweight.²² The obesogenic environment has also been driven by cultural factors, such as a preference for traditional foods that are high in calories and an increase in fast food intake.²⁶ Socioeconomic variables, urbanisation and genetic susceptibility all contribute to

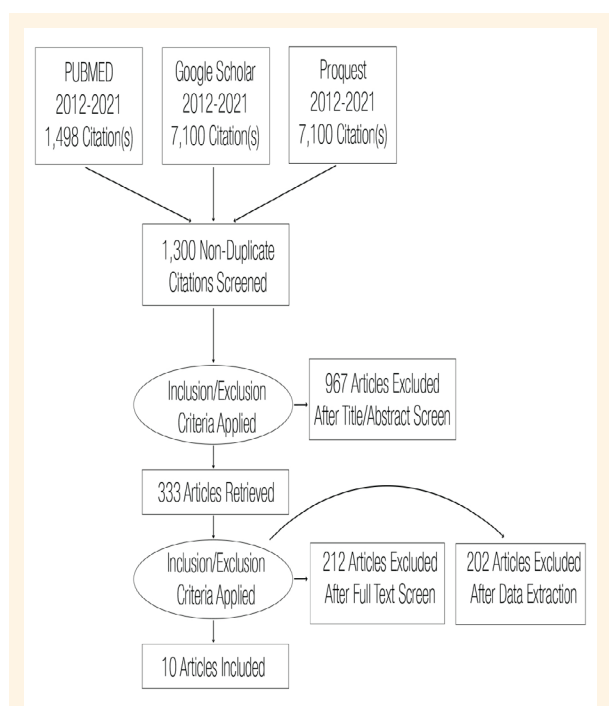


Figure 2: Preferred reporting items for systematic reviews and meta-analyses flowchart.

Table 1: Obesity and overweight prevalence.

Author and year of publication	Country	Methods	Age in years	Setting/ Rural or urban	n	Prevalence	Gender
Al-Nakeeb <i>et al.</i> ²² (2015)	Qatar	Quantitative study, self-reported questionnaire	18–25	Qatar University Urban	732 students	Overweight 39.5% male; 38.5% female	Male 320 Female 412
Kahan <i>et al.</i> ²⁵ (2007)	USA	Cross-sectional, self-reported BMI measures	18–29	San Diego and Los Angeles County	205	36.7% men; 19.0% women 9.2% men; 3.4% women	89 116
Alhakbany <i>et al.</i> ³¹ (2018)	Saudi Arabia	Cross-sectional study	18 and older	5 health science colleges (medicine, nursing, dentistry, applied medical science and pharmacy) at King Saud University	454	29.5% of females were overweight/obesity; 50.4% of the females were physically inactive	Females only
Al-Ghamdi <i>et al.</i> ²⁴ (2018)	Saudi Arabia	Cross-sectional study	18 and older	General population at Al Kharij Governorate Saudi Arabia	1019	26.7% of the population	381
Al-Kilani <i>et al.</i> ²³ (2012)	Oman	Cross-sectional study	18–25	Sultan Qaboos University, College students (Medicine, agriculture, nursing, education, engineering)	202	26.73%	1.49% 101
El Hajj Chehadeh <i>et al.</i> ²¹ (2020)	UAE	Experimental design	18–35	Urban	392 controls and 318	318	318 N/A
Kilpi <i>et al.</i> ³⁰ (2014)	Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Oman, Saudi Arabia and Turkey.	A regression analysis of cross-sectional data		Urban			
Labban <i>et al.</i> ²² (2015)	Oman	Biophysical measurements	18–44	Rural	226	17	43
Oguoma <i>et al.</i> ²⁸ (2021)	Kuwait	Cross-sectional survey	18–82	Rural/urban	4901	42.1%	40.6% Male and female Kuwaiti and non-Kuwaiti
Bays <i>et al.</i> ²⁹ (2022)	USA	Roundtable discussion	Not specified	Mediterranean & Middle East Regions Mediterranean regions including: Italy, Greece, Spain, southeastern France (Provençal), as well as applicable Mediterranean Sea areas of Portugal, Turkey, Cyprus, Egypt, west Levant area (e.g. Israel, Lebanon, Jordan, Palestine, and Syria) and northern Africa Maghreb region (e.g. Morocco, Algeria, Libya, and Tunisia).	Not determined		high Yes

BMI = body mass index; N/A = not applicable

Table 2: Biological, social-cultural and environmental determinants.

Author and year of publication	Methodology	Findings
El Hajj Chehadeh <i>et al.</i> ²¹ (2020)	Experimental design n = 318	Data showed that the main single nucleotide polymorphisms linked to risk of overweight/obesity in the young UAE Arab population is rs3751812 of the FTO gene.
Alhakhbany <i>et al.</i> ³¹ (2018)	Cross-sectional study n = 454	50.4% of the females were physically inactive. Level of activity of females was not associated with overweight/obesity, sleeping time, sedentary behaviours or dietary habits.
Labban <i>et al.</i> ²² (2015)	Biophysical measurements n = 266	This study's findings showed that although university students in Oman still have lower rates of overweight and obesity than those in neighbouring nations, those rates are rising. The vast majority of young people have typical VFL. Male and female individuals who were highly overweight or obese were the only ones to have high VFLs, which means they can be utilised as a warning sign for serious health issues related to obesity, such as diabetes and heart attacks. The rise in meal skipping rates and low consumption of vegetables and fruits can be blamed for the rise in overweight and obesity as well as the change in body composition.
Al-Kilani <i>et al.</i> ²³ (2012)	Cross-sectional study n = 202	High and very high BFS were prevalent among the participants with sedentary lifestyles.
Kahan <i>et al.</i> ²⁵ (2007)	Cross-sectional, self-reported BMI measures n = 205	No significant association between socio-economic situation and BMI.
Oguoma <i>et al.</i> ²⁸ (2021)	Cross-sectional survey n = 4,901	Men were more likely to be obese than women were to be overweight. Young adults between the ages of 18–29 have a high prevalence of obesity and overweight, which is a serious public health issue. The early detection and prevention of overweight/obesity in Kuwait will be greatly aided by initiatives to incorporate required physical education into the school curriculum and to encourage the establishment of recreation areas and parks to encourage physical activity.
Bays <i>et al.</i> ²⁹ (2022)	Roundtable discussion	Both the Mediterranean diet and Middle East diet are considered as a preferable diet for the people to reduce obesity.
Al-Nakeeb <i>et al.</i> ³² (2015)	Quantitative study, self-reported questionnaire n = 732	Three distinct cultural lifestyles: 1. High risk (poor diet and little physical activity) 2. Moderate risk (limited usage of computers and TVs) 3. Minimal risk (mild physical activity, a balanced diet)
Alhakhbany <i>et al.</i> ³¹ (2018)	Cross-sectional study n = 454	50.4% of the females were physically inactive. Level of activity of females was not associated with overweight/obesity, sleeping time, sedentary behaviours or dietary habits.
Kilpi <i>et al.</i> ³⁰ (2014)	A regression analysis of cross-sectional data	In the majority of countries, both men and women now experience high rates of overweight and obesity.

VFL = visceral fat level; BMI = body mass index

the development of overweight and obesity.²⁷ The study by Oguoma *et al.* sheds light on the socioeconomic causes of obesity in this particular community by examining the link between sociodemographic traits and weight status.²⁸

Kuwait's overweight and obesity rates show an association between weight status and a variety of social variables, such as age, gender, education and income.²⁸ Bays *et al.* argued that collaboration between healthcare professionals, policymakers, educational institutions, community organizations and other stakeholders is necessary to address the socioeconomic

determinants of obesity.²⁹ Coordination of activities can result in greater reductions in obesity rates. In addition to biological considerations, socio-cultural influences (such as traditions), societal norms and economic circumstances have a big impact on the prevalence of overweight and obesity. These socio-cultural factors can differ among MENA nationalities and are a factor in the region's high rate of overweight and obesity. Several socio-cultural factors that are important are traditional diets, family social gatherings, sedentary lifestyles, urbanisation, gender roles and beauty standards.

In the MENA and GCC regions, overweight and obesity have significant negative effects on both the individual and the society. Obese people are more likely to develop chronic illnesses such as type 2 diabetes, cardiovascular disease and certain types of cancer.^{20,30} Additionally, obesity has a substantial negative impact on healthcare systems, increasing expenditures and lowering quality of life for patients.²⁶ The environmental determinants of obesity play a crucial role in the prevalence of overweight and obesity in the MENA and GCC regions. Alhakbany *et al.*'s examination of lifestyle factors, such as physical activity levels, dietary patterns, sedentary behaviour and sleep duration, provides insights into the specific lifestyle habits that may contribute to overweight and obesity in the Saudi population.³¹ The incidence of overweight and obesity among MENA nationalities is significantly influenced by environmental variables, which include the physical, social and economic components of the environment.

These environmental variables may affect dietary preferences, resource accessibility and community health practices. It has been suggested that promoting health education and awareness campaigns targeting young adults and Saudi women can help raise awareness of the importance of healthy lifestyle habits, including regular physical activity, balanced diets, stress management and adequate sleep.³² Moreover, evidence suggests that implementing wellness initiatives in health science colleges encourages Saudi women to adopt healthy living practices. These initiatives can include weight management workshops, stress-reduction exercises, healthy eating options and physical activity campaigns.

Major global health concerns related to numerous non-communicable diseases (NCDs) are linked to overweight and obesity. Kilpi *et al.* and Ghamdi *et al.*'s studies provide evidence of the continued rise in global obesity rates.^{24,29} This indicates that obesity is a critical public health issue that demands an urgent response. Furthermore, the review analysis suggests that the relationships between the determinants of overweight and obesity must be taken into account in order to manage these issues among MENA nationalities.

RECOMMENDATIONS

A thorough, multi-sectoral strategy is needed to combat the obesity epidemic in the MENA region. It is recommended to improve the understanding of the size and complexity of the issue to inspire action at the policy, community and individual levels. The general public should first and foremost be made more aware of the value of exercise and a good diet by implementing health promotion activities. Another recommendation is the implementation of legislation that promotes

the consumption of healthier meals, restricts the marketing of unhealthy foods and promotes physical activity in workplaces and educational institutions. Furthermore, medical professionals should be proactive in recognising and treating obesity, offering help and encouragement to those who need it. Policies and interventions should be culturally responsive and take into account the cultural norms, beliefs and eating customs prevalent among the populations in the MENA region, given its variety. The promotion of a wide array of healthy eating choices can also help in the fight against obesity. In order to combat overweight and obesity, it is additionally important to address socioeconomic inequalities. Expanding chances for physical activity, improving access to nutrient-dense food options and addressing gaps in healthcare access should be policymakers' top priorities. Due to the rise of obesity-related NCDs, the world's healthcare systems are under great pressure. Rising healthcare costs, increased demand for medical services and the need for specialised treatment all contribute to this pressure.

This article described the determinants of the obesity epidemic on the healthcare and MENA population, emphasising the importance of early detection and intervention. Obesity and overweight-related public health problems are a major concern in the MENA region, and swift action must be taken. Combining health promotion campaigns, legislative changes and healthcare support can help fight obesity and improve the general health and well-being of individuals in the region. In light of the prevalent variables and features of the population, tackling the problem of obesity and overweight in the MENA region requires unique initiatives and treatments that directly address the causes.

Conclusion

This scoping review of the biological, social and environmental determinants of overweight and obesity among MENA nationalities sheds vital light on the intricate interplay of elements driving this urgent public health concern. The results of this review demonstrate the complexity of overweight and obesity in the MENA region, highlighting the necessity for an all-encompassing strategy to address the issue. The biological causes of overweight and obesity are genetic predisposition, metabolic conditions and lifestyle. It has also been demonstrated that socioeconomic factors, which are part of the larger social determinants of health, have an impact on the prevalence of obesity. These factors include income disparity, access to education and employment possibilities. The region's

rising rates of overweight and obesity have further been influenced by environmental variables such as urbanisation, food accessibility and obesogenic surroundings.

AUTHORS' CONTRIBUTION

GFDV conceptualised the study and devised the research methodology. GFDV, MBA and NAZ collected the data; performed the data screening, review and analysis; and wrote the draft and reviewed the manuscript. All authors approved the final version of the manuscript.

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