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SURGERY FOR OBESITY AND RELATED DISEASES

Review article

# Bariatric surgery in the Middle East and North Africa: narrative review with focus on culture-specific considerations

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**Abstract** There is an increasing volume of bariatric surgeries in the Middle East and North Africa (MENA), but the context of bariatric surgery in the region is not fully understood. Incorporating culture-specific considerations in the provision of care to patients who undergo bariatric surgery may help to optimize outcomes after surgery. We conducted a narrative review of published research studies on bariatric surgery in the MENA region, highlighting cultural and contextual aspects relevant to the care of bariatric surgery patients who undergo surgery in this geographic area. The authors searched the following online databases: PubMed, CINAHL, Embase, and Academic Search Elite from 2010–2020 for studies conducted in 18 countries in the MENA region. This narrative review identifies cultural-specific considerations that may affect bariatric care and outcomes in 6 domains: knowledge of bariatric surgery; mental health, body image, and quality of life; influence of family; religion and lifestyle; preoperative practices; and healthcare access. Provision of culturally congruent care may help patients to achieve the best possible outcomes after bariatric surgery. Results may inform efforts to provide safe and culture-specific care in the MENA region, as well as those who migrate or seek care in other countries. More research is warranted on this heterogeneous population to optimize postsurgery weight trajectory and psychosocial adjustment. (Surg Obes Relat Dis 2021;17:1933–1941.) 

*Key words:* Bariatric surgery; Culture; Dietary habits; Family influence; Healthcare access; Lifestyle; Middle East; North Africa; Obesity; Perioperative standards

The International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) Global Registry Report 5th edition documented over 800,000 bariatric surgical procedures across 61 countries and 17 national registries from 2014 to 2019 [1]. In the Middle East and North Africa (MENA) region, where most countries are part of Arab culture [2], there has been an increasing volume of surgeries to address obesity and metabolic disorders [3,4].

Approximately 20% of the adult population in the MENA region is classified as obese [4], with geographic variation; in the United Arab Emirates (UAE) National

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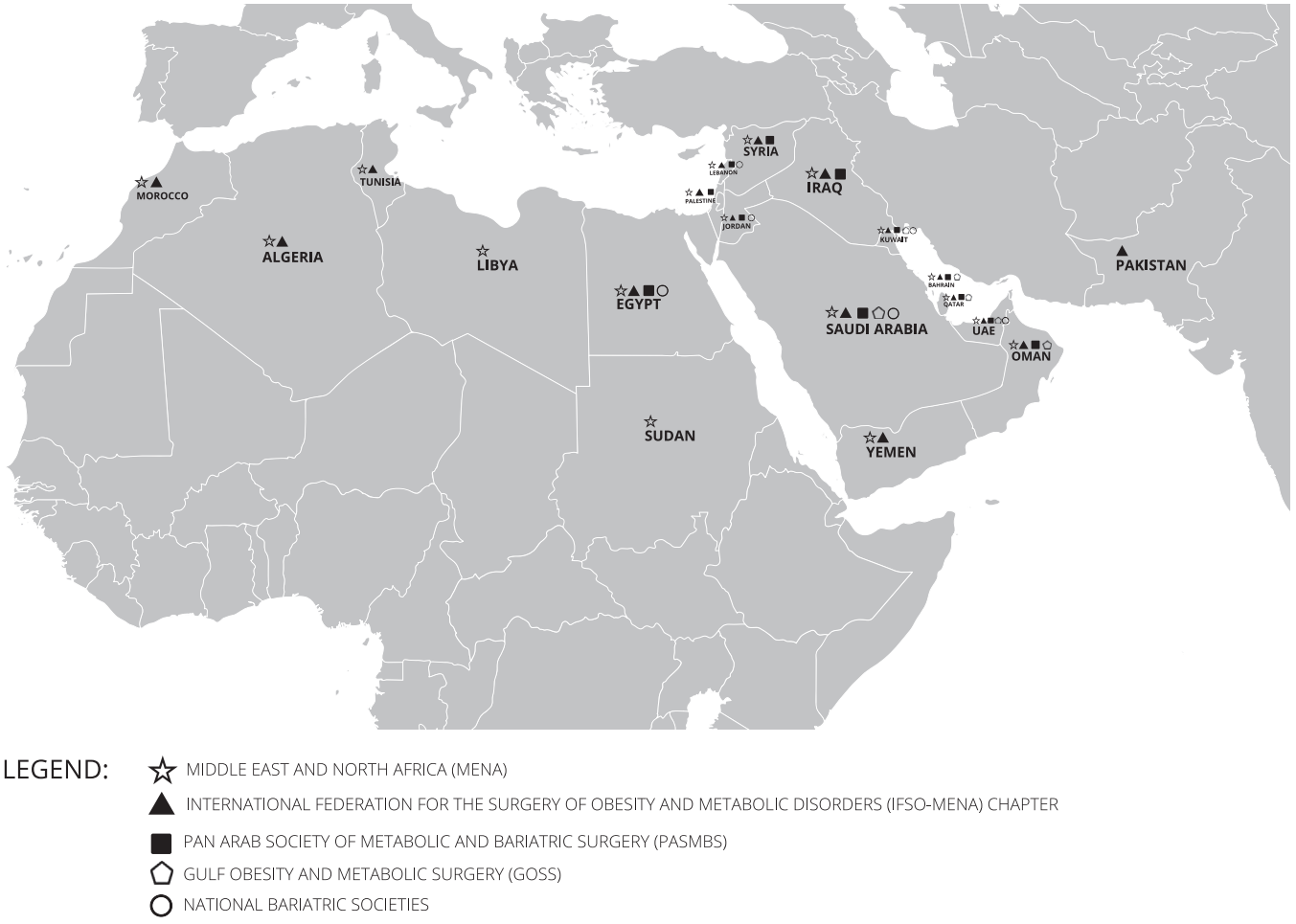


Figure 1. MENA map and bariatric associations.

Diabetes and Lifestyle Study (DIAB), the prevalence of obesity was 32.3% [5]. Differences have also been noted among sociodemographic subgroups as well. For example, a review found that women in the MENA region are on average 10.3% more likely to be obese than men [6], compared with 4% globally [7]. A systematic review and meta-analysis documented an increasing prevalence of childhood obesity in several countries in the MENA region, particularly the Arabic countries in the Gulf area [2,8].

Obesity affects the overall health of the region. A meta-analysis found the prevalence of metabolic syndrome in the MENA region was around one third, ranging from 23.6% in Kuwait to 40.1% in the UAE [9]. Additionally, diabetes prevalence and risk factors have been found to vary across different ethnic groups in the UAE [10] and among men living in different countries in the MENA region [11]. The prevalence of obesity and obesity-related co-morbidities in the MENA region has been attributed to rapid urbanization, adoption of a Western lifestyle, consumption of an unhealthy diet, and inactivity [2,12], factors which may also be related to the cultural context of bariatric surgery.

With respect to bariatric surgery in the MENA region, the indication has been BMI $\geq$ 40 kg/m$^2$ or BMI $\geq$ 35 kg/m$^2$ with obesity-related co-morbidities [13]. However, bariatric surgery is increasingly considered a treatment option for individuals with a BMI as low as 30 kg/m$^2$ with uncontrolled diabetes [14]. A multidisciplinary panel of experts developed a set of recommendations for treatment of overweight and obesity in the UAE, streamlining existing international practice guidelines for relevance, coherence, and usability in the local context [15]. The panel recommended that the ethnicity of the patient should be taken into account when addressing obesity-related issues.

In this paper, we review published research studies on bariatric surgery in the MENA region, highlighting cultural and contextual aspects relevant to the care of bariatric patients in this population. Incorporating culture-specific considerations in providing care to bariatric patients may improve clinical practice and help to optimize patient outcomes after bariatric surgery.

Table 1
Culture-specific considerations in bariatric care in the MENA

| Domain | Culture-specific results | Recommendations |
|---|---|---|
| Knowledge of bariatric surgery | •Limited information about bariatric surgery indications and outcomes among providers and general population | •Develop novel approaches to patient and provider education<br>•Identify and address language or other barriers to knowledge acquisition |
| Mental health, body image, and quality of life | •Positive impact of bariatric surgery on quality of life and body image, with desire for body contouring surgery<br>•Impact on mental health not well characterized | •Address interest in body contouring surgery<br>•Tailor interventions to optimize outcomes, including mental health |
| Influence of family | •Familial influence on eating and lifestyle habits pre- and post-surgery<br>•Impact on patients' decision to seek surgery, especially among women and children. | •Leverage family support including communal meals<br>•Consider sex roles |
| Religion and lifestyle | •No evidence fasting during the holy month of Ramadan affects outcomes<br>•Disordered eating behaviors, poor nutrition, and low dietary compliance may affect weight loss<br>•Physical activity and exercise not well characterized | •Further explore religious influences<br>•Address problematic eating in context<br>•Study role of physical activity and exercise |
| Preoperative practices | •Lack of uniform standards for screening and perioperative care may affect compliance and outcomes | •Develop regional guidelines |
| Healthcare access | •Limited access to bariatric care programs<br>•Variable outcomes of surgery | •Optimize access and funding<br>•Establish registries |

## Methods

The authors conducted a narrative review, beginning with comprehensive literature searches of PubMed, Embase, CINAHL, and Academic Search Elite (a database that includes broad coverage of the MENA region). These searches were structured using Boolean operators to combine keywords and database subject terms for bariatric surgery, specific MENA countries, and the MENA region. As shown in Fig. 1, the authors followed the example of Farrag et al. [2] and took MENA to include Algeria, Bahrain, Egypt, Iraq, Jordan, Saudi Arabia, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Sudan, Syria, Tunisia, the UAE, and Yemen because they share similar language, culture, and traditions [11]. When appropriate, the search included demonyms to search for inhabitants of the countries. For example, inhabitants of Qatar are described both as Qataris or Qatarians. The searches used truncation to find variant word endings, such as, Arab* for Arab, Arabs, Arabian, or Arabians. When necessary and possible, the searches included subject explosions, a database feature that simultaneously searches for a broad concept such as North Africa and the individual countries' names (e.g., Algeria, Egypt, Libya, etc.).

Results in Academic Search Elite were limited to peer reviewed journals because this database includes newspapers, magazines, and other non–research-based periodicals. All searches were run on December 2, 2020. The authors used EndNote to store search results and locate full text, and Covidence review management software to screen abstracts, store full text articles, and make final decisions for inclusion/exclusion of studies.

### *Inclusion/exclusion criteria*

Studies considered for inclusion needed to address bariatric surgery in which a majority of the patients underwent surgery in a MENA country. The results were limited to articles written in English (or fully translated) between 2010 and 2020. This date range was selected to represent the current and recent state of practice in the MENA region. Studies were excluded if the full text of the study was not available, or if they did not address social or cultural issues that may influence cultural care such as technology; religion and philosophy; kinship; cultural values, beliefs, and lifeways; politics; economy; and education, in addition to psychosocial factors [16].

Two authors independently reviewed the titles, abstracts, and full text of the articles to apply the inclusion and exclusion criteria. As a result, 44 articles were found and used to provide the data presented in Table 1 highlighting culture-specific considerations in bariatric care in the MENA region, in accordance with an ecologic perspective, which focuses on the interaction of the people with their physical and sociocultural environment [17,18].

## Results

### *Knowledge of bariatric surgery*

Deficits in knowledge about bariatric surgery have been documented in the MENA region among both providers and patients. For example, a report in Kuwait found that primary care physicians' characteristics, such as sex and

weight status, as well as their misperceptions about bariatric surgery, are related to referral practices for bariatric surgery [19].

Several reports addressed knowledge of bariatric surgery in Saudi Arabia. Among residents of Riyadh, only 38% had favorable beliefs about bariatric surgery [20], more knew about the complications of laparoscopic sleeve gastrectomy (LSG) (64.8%) than its indications (59.0%) [21], and only 16.2% considered bariatric surgery as the best choice for weight loss [22]. Similarly, approximately 50% of respondents in Jeddah were unaware of the indications for bariatric surgery and 41.2% were unwilling to seek help if diagnosed with clinically severe obesity [23]. In a separate study, awareness of bariatric surgery was higher among women, those who underwent surgery, and health care workers [24]. In the eastern province of Saudi Arabia, 73.1% of women had poor knowledge regarding the obstetric and gynecological impact of bariatric surgery [25].

Thus, deficiency of knowledge about the indications and outcomes of bariatric surgery among providers in Kuwait as well as in the general population in Saudi Arabia may adversely affect referral for bariatric surgery. Data from other countries in the MENA region are lacking, and there may be a need for novel approaches to patient and provider education.

### *Mental health, body image, and quality of life*

Relatively few studies have examined mental health of bariatric surgery patients in the MENA region. A cross-sectional study in the UAE found that anxiety, depression, functional disability, impairment in quality of life (QoL), and disturbance of self-image were common among 105 patients pursuing bariatric surgery [26]. A review of literature on the experiences of people with type 2 diabetes (T2D) after bariatric surgery in Kuwait suggested individuals might avoid or neglect psychological support due to insufficient service and cultural stigmatization [27].

With respect to body image, an online survey found that only 32.3% and 42.6% of 108 participants in Saudi Arabia were very satisfied with their postsurgery general appearance and weight loss, respectively [28]. A study in Saudi Arabia showed 78% desire body contouring surgery following bariatric surgery [29]. A study of adolescents 5-years post-LSG in Qatar showed significant improvement in body image and psychological profile, as well as increased willingness to engage in social events [30]. Thus, available data suggest body image may improve, but some degree of dissatisfaction and desire for body contouring are not unusual.

QoL has been shown to improve following LSG in Egypt [31] as well as in Saudi Arabia among adults [32,33] and adolescents [34]. Moreover, studies of patients who underwent LSG in Lebanon [35] and female patients who underwent LSG in Iraq [36] showed post-surgery changes in QoL paralleled weight loss. Thus, numerous studies document improvements in QoL among adults and adolescents in several countries of the MENA region following LSG.

Available data suggest that bariatric surgery, particularly LSG, has a positive impact on QoL and body image of bariatric patients in some countries in the MENA region, but far less is known about mental health including depression and anxiety. Clinicians should be prepared to address pre- and postsurgery mental health concerns as well as interest in body contouring surgery.

### *Influence of family*

The majority of the population in the MENA region are of Arab ethnicity and identify with Arab culture, which is known for strong kinship bonds. Family members' influence is particularly salient in coping with chronic illnesses such as obesity. In a qualitative study of 7 women contemplating bariatric surgery in Saudi Arabia, surgery was considered as protective of health and to access normatively acceptable female roles, with some encouraged by relatives who had undergone surgery [37]; participants described family caregiving responsibilities, restrictions on their physical and social activities, barriers related to accessing exercise facilities, and a sedentary lifestyle. Additionally, the practice of eating with extended family and community groups was associated with eating large, calorie-rich diets in a retrospective study of bariatric surgery patients in Saudi Arabia [38]. A case series of 3 sisters in Kuwait who presented for revisional surgery post-LSG displayed modeling whereby younger siblings adopt attitudes and behavior from older siblings [39].

Thus, available studies suggest that families in the MENA region have an influence on pre- and postsurgery lifestyle habits, as well as influence over the patient's decision to seek surgery, especially among women and children. Clinicians may wish to leverage family support including communal meals, while taking sex roles into consideration.

### *Religion and lifestyle*

Islam is the most common religion in the MENA region, and there have been concerns among providers regarding the possible impact of Ramadan (which involves fasting from dawn to sunset during the lunar month) on bariatric surgery patients. However, a comprehensive, multidisciplinary program found no differences in emergency department visits, readmission rates, reoperation, and complications within 30 days, among patients who underwent primary bariatric surgery in Abu Dhabi, UAE, up to 3 months before and during the month of Ramadan as compared with patients from the remaining 8 months of the year [40].

Other studies have focused on adherence to postsurgery lifestyle recommendations. A retrospective cohort in Bahrain revealed that the level of adherence to dietary and lifestyle recommendations was high to moderate,

contributing to accelerated weight loss following bariatric surgery [41]. In Lebanon, a retrospective study documented a trend for sweet eating in patients with less dumping symptoms post-LSG, which might impact weight loss [42]. Indeed, in Saudi Arabia the habit of sweet eating postoperatively was associated with weight loss in a retrospective study of 36 bariatric patients [43]. A retrospective review of medical records of 84 bariatric patients in Bahrain affirmed that eating disorder behaviors and attitudes (e.g., restraint, eating, shape, and weight concerns) were significantly associated with poor weight loss after surgery [44]. Research has also documented weight regain due to unhealthy diet and behavior stemming from a lack of nutritional guidance and knowledge among patients ≥18 months after surgery in Saudi Arabia [45].

With respect to nutrition, a study of patients in Kuwait documented deficiencies before and up to 5 years post LSG [45]. A cross-sectional study of patients in Saudi Arabia found insufficient general and postbariatric nutritional knowledge [46]. A pilot study reported only 1 out of 10 patients reported high adherence to the dietitian's instructions, and more than two thirds rated dietary advice provided by dietitians as vague, in a postsurgery outpatient nutrition clinic in the UAE [47]. Nutritional education provided to the patients postoperatively after LSG was associated with weight loss among 137 adolescents in Kuwait [48]. Similarly, nutrition counseling among 25 patients in Jordan enhanced the intake nutrition at 6 months post-LSG compared with 15 patients in a control condition [49].

Thus, available evidence suggests no adverse impact of Ramadan on bariatric surgery patients in the MENA region. However, disordered eating behaviors, poor nutrition, and low dietary compliance may adversely impact weight loss; reports on physical activity are not well represented in the literature on bariatric surgery in the MENA region. Clinicians may wish to take religious influences and lifestyle factors such as diet and exercise into consideration when addressing problematic eating.

### *Preoperative practices*

Studies suggest inconsistencies in preoperative screening and preparation for surgery in the MENA region. A survey answered by 93 surgeon members of Pan Arab Society of Metabolic and Bariatric Surgery (PASMBS) documented wide variability in such practices (i.e., referral to dietitian, smoking cessation, referral to psychologist, screening for obstructive sleep apnea, colonoscopy screening and cardiologist referral for patients above 50 years, drain and urinary catheter placement, leak test, thromboembolism prophylaxis, and vitamin supplementation) [50].

A survey of IFSO-MENA surgeon members documented that 65% of 148 respondents did not perform routine preoperative endoscopy for patients undergoing one anastomosis gastric bypass [51]. Retrospective studies have suggested that routine esophagogastroduodenoscopy (EGD) can be informative in preventing the cancellation or postponement of bariatric surgery in the UAE [52] and Saudi Arabia [53], whereas other studies showed no benefit in surgical management in Qatar [54] and among individuals without symptoms of gastroesophageal reflux disease in Jordan [55]. Therefore, the lack of uniform standards for preoperative care may affect compliance, implementation of evidence-based practice, and ultimately patient outcomes after bariatric surgery in the MENA region.

### *Healthcare access*

The 4th IFSO global registry reported that 68% of bariatric operation expenses were paid for by the public health services [56], with a great deal of variation in rates of publicly-funded surgery among countries including those in the MENA region. Saudi Arabia and Kuwait provide public health coverage for both bariatric surgery and metabolic surgery, while in the UAE and Qatar government insurance only covers bariatric surgery [13]. Limited healthcare resources combined with shortages of experts in laparoscopic bariatric surgery may present an additional pressure on both physicians and patients. Some low-income MENA countries may not have any access to bariatric surgery or may be lacking comprehensive bariatric programs [50].

Published reports document varied patient outcomes of bariatric surgery in the MENA region in adults [57,58] and youth [59,60]. However, a literature review [61] noted relatively few publications on bariatric surgery in the Arabian Gulf countries as compared with western regions and called for the creation of a regional registry. Rigorous data collection will help to document facilitators and challenges to successful surgical outcomes in the MENA region and inform efforts to optimize outcomes. Available data suggest access and outcomes vary throughout this region.

## Discussion

This paper presents a narrative review of bariatric surgery in the MENA region, where Arabic language and culture predominate. The vast majority of the population in the MENA region identify as Muslim, with the religion of Islam affecting attitudes and behavior [62]. We took this context, as well aspects of cultural care, into consideration when synthesizing information from 44 articles, grouping findings into the following domains: knowledge of bariatric surgery; mental health, body image and quality of life; influence of family; religion and lifestyle; preoperative practices; and healthcare access.

Results of this review suggest poor knowledge in the general population and providers regarding bariatric surgery. Many patients do not speak English, and nonnative healthcare providers are not fluent in Arabic; about two thirds of the physicians working in Saudi Arabia are expatriates

[63]. Arabian Gulf countries rely heavily on an expatriate workforce, posing challenges to the healthcare sector [64]. Language barriers may hinder the effectiveness of patient education and pre- and postoperative care among bariatric patients requiring intensive instructions on diet and lifestyle modifications. Clinicians should also take into consideration that social media is also a conduit for improving health literacy through delivery of high-quality, evidence-based information about bariatric surgery [65]. Research suggests that the quality of information about bariatric surgery is poor to fair in both the United States and UAE, with differences in the types of sites retrieved by the most commonly used search engines in each geographic region [66].

Papers reviewed suggest that bariatric surgery has a positive impact on mental health, body image, and QoL of bariatric patients in the MENA region. Evidence suggests that the region has high rates of depression, anxiety disorders, posttraumatic stress disorder, and suicide, along with a general lack of awareness about mental health, limited mental health services, and stigmatization [67]. A better understanding of the relationship between mental health and postsurgery weight trajectory may help to develop culturally tailored interventions that could further improve patient outcomes in the MENA region.

Research suggests familial influences on the choice to pursue surgery and behavior afterward among youth and adult patients in the MENA region. This is not surprising as people from the MENA region thrive on strong family bonds, with family involvement in one's healthcare needs, including spontaneous hospital visits and generational close contact with hospitalized patients noted [37]. Family involvement and support may be essential to longer-term outcomes, as diet and physical activity are key to weight management [2,12]. A literature review found sharing homecooked meals together with family led to healthier dietary outcomes, with a higher intake of nutritious food and a lower intake of sugar-sweetened beverages and fast food [68]. Thus, the influence of family has potential to be a major factor in improving the weight trajectory of patients who undergo bariatric surgery in the MENA region.

Although we found no evidence that Ramadan had an adverse effect on bariatric surgery outcomes, religious practices could influence the behaviors of individuals, and specific beliefs can affect patients' decision to access and seek medical treatment [69]. For example, Islamic principles closely regulate and govern the life of every Muslim person wherein surgical intervention may only be allowed after noninvasive methods have been exhausted and/or if the benefits outweigh the risks [70]. Hence, religion may be an important determinant of health outcomes and warrants explicit attention [71]. Religious beliefs may affect the choice to undergo bariatric surgery and postsurgery outcomes in the MENA region, with implications for both research and practice. Data suggest that lifestyle factors such as eating behaviors, nutrition, and dietary adherence affect postsurgery outcomes in the MENA region. The result is congruent with a report on how patients experience and manage lifestyle changes following LSG in China, including culture-specific difficulties in adherence to follow-up visits and lifestyle recommendations [72]. Further understanding of how religious and lifestyle factors affect bariatric surgery outcomes could help providers support patient efforts at self-management.

Preoperative practices and access to bariatric surgery may be inconsistent in MENA region. Thorough preoperative patient assessment is important for optimal outcomes in bariatric surgery [73]. This requires the development of regional guidelines based on international recommendations, taking into consideration contextual and cultural factors. Barriers to the healthcare delivery access in Arab countries are related to social, cultural, administrative, organizational, and financial, as well as ethnic factors [74]. Some government healthcare facilities in the MENA region restrict expatriates from obtaining medical services, raising issues of access according to nationality. In Saudi Arabia, healthcare restructuring has been implemented to privatize public hospitals and introduce insurance coverage for both foreign workers and citizens to address rapidly escalating healthcare costs [75]. Similarly, Syrian refugees residing in Jordan and Lebanon, countries with already overburdened healthcare systems, are required to have civil documentation or pay for medical care, resulting in greater difficulty in accessing treatment [76,77]. The World Health Organization called for a stronger commitment in improving health as a central component of sustainable development including strengthening resources, allocating and sustaining funding, providing universal access to care, achieving quality care, and establishing surveillance systems to identify strength and weakness [78].

The IFSO-MENA Chapter was founded in 2017, uniting the efforts of the Gulf Obesity Surgery Society (GOSS), the PASMBS, and the National Bariatric Societies of the UAE, Saudi Arabia, Kuwait, Jordan, Lebanon, and Egypt. With more MENA countries participating in this organization (Fig. 1), there is a need to consider how culture relates to practice variations. The dataset derived from the IFSO Global Registry demonstrates variations in patient and operation selection worldwide [56]. In the MENA region, LSG is the most commonly performed procedure, followed by Roux-en-Y gastric bypass, one anastomosis gastric bypass, and adjustable gastric band, which could be due to the shorter learning curve [50]. There is great variability in the perioperative bariatric surgery care, surgeon experience, and setup of the bariatric surgery programs in the MENA countries [50]. Ideally, the choice of procedure should be based on a shared decision-making process that prioritizes patients' own values and preferences, including those coming from countries without comprehensive bariatric

programs who travel for bariatric surgical services. It should be noted that we did not identify any published studies on bariatric surgery in some of the countries of the region (i.e., Algeria, Morocco, Sudan, Tunisia, Yemen) that were relevant to culture. Thus, it is not known if results are generalizable to these countries. The current review is also limited to English articles or fully translated texts within the last 10 years, with possible publication bias around this topic. There might be articles from other databases or unpublished research studies that were not accessed or found. It should also be noted that the vast majority of articles pertained to LSG, and results may not extend to other procedures in use. Nonetheless, the methodologic and systematic evaluation applied in this narrative review reduces the risk of selection bias of articles included.

## Conclusion

Bariatric surgical procedures continue to gain acceptance as treatment for severe obesity in the MENA region. This paper is the first to review research pertaining to contextual considerations and to offer guidance to healthcare professionals on integrating culture-sensitive bariatric services in this population, including those who subsequently seek care outside of the region. Thus, this narrative review provides a novel contribution in understanding culturally appropriate bariatric surgery care. Although there is a growing body of evidence regarding bariatric surgery in the MENA region, more research is needed to support efforts regarding patient screening and education prior to bariatric surgery, as well as optimal weight loss and psychosocial adjustment afterward.

## Disclosures

*The authors have no commercial associations that might be a conflict of interest in relation to this article.*

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Editorial comment

# Comment on: Bariatric surgery in the Middle East and North Africa: narrative review with focus on culture-specific considerations

The prevalence of obesity has increased at an alarming rate during the last 3 decades in the Middle East, and this appears to be more pronounced in women. Kuwait, Bahrain, Saudi Arabia, and the United Arab Emirates are among the top countries worldwide in terms of obesity incidence. As an example, 30% of males in Kuwait and 55% of females over the age of 15 were classified as having obesity, making Kuwait the country with the highest prevalence of obesity in Arabic-speaking countries at that time [1]. The prevalence of obesity is partly due to rapid infrastructural changes. The Arabian Gulf has experienced significant growth from natural resources, and this has subsequently impacted rapid urbanization, technical advancements, and improved living conditions [2]. Currently, bariatric surgery is considered the most effective treatment to reduce morbidity and mortality in patients with severe obesity. Sleeve gastrectomy (SG) is the most common operation worldwide, followed by Roux en-Y gastric bypass (RYGB) and one-anastomosis gastric bypass (OAGB), with significant geographic variation.

This paper from Inocian et al. is a narrative review of cultural-specific considerations impacting bariatric surgery in the Middle East–North Africa (MENA) region [3]. This is an important topic for journal readers as culturally congruent care has been shown to be more effective [4], and there are few data from the MENA region. Arabic culture and Islamic religion predominate in this region and affects patient attitudes and behaviors. The authors grouped their review into 6 bariatric surgery care domains and incorporated literature from 2010–2020. These domains are 1) knowledge of bariatric surgery in the MENA region; 2) mental health; 3) body image and quality of life; 4) influence of family; 5) religion and lifestyle; and 6) preoperative practices and health care access.

The review highlighted several studies on knowledge of bariatric surgery among patients and providers in the MENA region that may impact referral for bariatric surgery. For example, among Saudi Arabian citizens, only 38% had favorable beliefs about bariatric surgery; more knew about the complications of SG than its indications, and very few considered bariatric surgery as the best choice for weight loss. Another important finding is the paucity of mental health data, including depression and anxiety, among patients undergoing bariatric surgery in the MENA region. The paper also suggests that within the MENA region, familial opinions strongly influence youth and adult patients' decisions to pursue bariatric surgery. Additionally, the paper gives specific recommendations that may address cultural considerations to optimize patient outcomes. For instance, the authors found variable patient outcomes in the MENA region following bariatric surgery and identify a potential need to create a regional bariatric surgical registry. The authors concluded novel approaches are needed to educate patients and