Original Article :

Awareness of Indications and Complications of Sleeve Gastrectomy among Obese and Overweight People in Saudi Arabia.

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Abstract

Background and Aims:
Obesity is a significant worldwide health issue hindering individuals' daily activities and raising the risk of numerous illnesses that can lead to serious complications. However, research studies have shown that sleeve gastrectomy (SG) can have a considerable impact on improving comorbidities and is the most effective treatment for obesity. Therefore, our current study targeted obese and overweight people in Saudi Arabia to assess their awareness of the indications and complications of SG.

Methods:
A digital cross-sectional survey was distributed in December 2022 among a general population in Saudi Arabia via social media channels.

Results:
A total of 902 eligible participants were enrolled in the study. Their mean age was 31.5 years, and the majority of participants were female 505 (56%). Meanwhile, 557 (61.8%) participants had a university degree. Regarding body mass index, 505 (56%) were obese, while the remaining were overweight. Of the participants, 882 (97.8%) have heard about SG. Moreover, 60.6% believed that they understood the indications of SG, while 573 (63.5%) believed that they understood the complications of SG. A total of 420 (46.6%) participants had overall good awareness levels, while 482 (53.4%) had poor awareness levels regarding SG.

Conclusions:
Our study findings showed that almost half of the participants were well informed regarding the indications and complications of SG. Moreover, participants with post-graduate degrees exhibited good levels of awareness compared to those with only a secondary level of education. Nevertheless, the establishment of health-related educational activities to promote general awareness of SG is recommended.

Keywords:
complications, obesity, sleeve gastrectomy, Saudi Arabia.

Introduction

Obesity is a serious health issue that often interferes with daily activities and raises the risk of many diseases like hypertension, diabetes, cardiovascular diseases, and obstructive sleep apnea, which can lead to death[1]. Obesity is defined by the World Health Organization (WHO) as a body mass index (BMI) greater than 30 kg/m2, while overweight is defined as a BMI higher than 25 and lower than 30 [2]. According to 2016 WHO data, approximately 13% of the global adult population in the world (11% male; 15% female) were obese and 39% of adults aged 18 years and older(39% of men; 40% of women) were overweight[3]. In Saudi Arabia, the Saudi Health Interview Survey reported that 24.1% of females and 33.5% of males were obese, while the prevalence of overweight among males and females was 33.4% and 28.0%, respectively[4]. Major risk factors that can lead to obesity include genes, physical activity, cultural factors, environment, food consumption, and fetal nutrition[5]. However, weight can be reduced initially by lifestyle-based conservative measures like food modification and exercise, as well as by medical modalities such as medication therapy[5]. Bariatric surgery (BS) has become the most successful treatment for obesity in individuals with a BMI greater than 40 kg/m2, a BMI between 35 and 40 kg/m2 with comorbidities, or a failure of prior attempts at weight loss[5-7]. Sleeve gastrectomy (SG) is one of the most common methods of BS aside from Roux-en-Y gastric bypass, gastric balloon, and laparoscopic adjustable gastric banding, which all have a significant impact in improving comorbidities like hypertension, diabetes mellitus type 2, ischemic heart disease, and gastroesophageal reflux disease[5]. However, the prevalence of postoperative complications ranges between 4.4% and 12.8% [1]. Many studies have reported numerous complications associated with sleeve gastrectomy (SG), such as anastomotic leaks, bleeding, abscesses, nutritional deficits, vein thromboses, and surgical site infections[1,6,7]. Anastomotic leak is a dangerous complication that is challenging to manage and frequently presents following discharge, likely occurring in 1.3% of patients.

Moreover, in 2.8% of cases, metabolic disturbances, multiple organ failure, septicemia, abscesses, fever, and other symptoms often occur[5,8,9]. Another serious problem is bleeding, which has been found to occur in 1.8%–5% of cases[1]. The Arabian Gulf countries have the highest percentage of registered bariatric procedures, although in comparison to Western countries, the Arabian Gulf countries have originated

the lowest number of research publications about BS[10]. While Saudi Arabia continues to use BS as one of the interventions to manage the country's rising obesity rates, many obese people remain unaware of the associated problems[1,11]. Based on this, our aim in this study was to measure the awareness levels regarding SG indications and complications among overweight and obese people in Saudi Arabia.

Subjects and methods

Study design and ethical considerations:

A cross-sectional survey was distributed to a general population in Saudi Arabia from December 20, 2022 to January 15, 2023 after ethical approval was granted by Umm Al-Qura University's Biomedical Research Ethics Committee (approval number: HAPO-02-K-012-2022-11-1345).

Study setting and population:

Obese and overweight participants aged 18 to 65 years and living in Saudi Arabia were included in the study. We excluded those who were unwilling to complete the survey.

Sample size:

Calculated according to Epi Info™ [7.1.5], we required an estimated minimum of 384 participants to be enrolled in our study with a confidence interval level of 95% and margin of error of 5%[12]. We followed convenience sampling technique in sample selection, and we successfully enrolled 902 participants.

Data collection tool:

The study tool used in the present study to investigate the participants'awareness of the indications and complications of SG was adapted from a previously published study[13]. The administered questionnaire was translated into Arabic by two independent bilingual translators, then a panel of translators and experts reviewed the translation to resolve any discrepancies. To guarantee that there were no errors in the investigation tool, a reserve translation from Arabic to English was performed. Ten respondents reviewed the questionnaire before the distribution of the survey and provided feedback that led to the simplification of specific medical terminology and the revision of several questionnaire items. The Arabic version of the questionnaire was used to collect participants' data, while the English version was used to show the data in the article. The questionnaire included participants' demographic characteristics as well as their general awareness regarding SG and its indications and complications. A self-administered survey designed using the Google platform was distributed through the WhatsApp and Telegram groups that included our study population. The online survey included online

written informed consent and was required from all participants. The corresponding author's WhatsApp application number was included in the survey text message for participant queries.

Data analysis:

The data were collected, reviewed, and then fed into the Statistical Package for Social Sciences (SSPS) version 21 (IBM). All statistical methods used were two tailed with an alpha level of 0.05; significance was considered if a P value was less than or equal to 0.05. Regarding awareness, each correct answer was given a 1-point score. A participant's overall awareness level regarding sleeve gastrectomy was assessed by summing up the discrete scores for the various correct knowledge items. The overall awareness score was categorized as being at a poor level if a participant's score was lower than 60% of the overall score; a good level of awareness was considered if the participant's score was 60% or higher of the overall score.

Descriptive analysis was performed by describing the frequency distribution and percentage for all study variables, including participants' personal data and BMI. Moreover, participants' perceptions and awareness of sleeve gastrectomy were tabulated, while overall knowledge level was graphed. Cross tabulation to show the distribution of participants' overall awareness levels according to their personal data and other factors was performed using a Pearson's chi-square test for significance; an exact probability test was used if there were small frequencydistributions

Result

A total of 902 eligible participants completed the study questionnaire. Participants' ages ranged from 18 to 65 years with mean age of 31.5 ± 13.9 years old. Exact of 505 (56%) participants were females. As for education, 557 (61.8%) had university level of education, 230 (25.5%) had secondary level of education and 78 (8.6%) had post-graduate degree. As for BMI, 397 (44%) were overweight, while the remaining were obese and 177 (19.6%) had class III obesity (table 1).

Table 1. Personal data and BMI of overweight and obese people in Saudi Arabia

Personal data	No	%
Age in years		
18-25	288	31.9%
26-35	231	25.6%
36-45	218	24.2%
46-55	125	13.9%
> 55	40	4.4%
Gender		
Male	397	44.0%

Personal data	No	%
Female	505	56.0%
Education		
Below secondary	37	4.1%
Secondary	230	25.5%
University	557	61.8%
Post-graduate	78	8.6%
Body mass index		
Overweight	397	44.0%
Class I obesity	37	4.1%
Class II obesity	291	32.3%
Class III obesity	177	19.6%

Table 2; Showed awareness of indications and complications of SG among obese and overweight people in Saudi Arabia. Exact of 882 (97.8%) heard about SG, and 751 (83.3%) heard about the BMI. A total of 452 (50.1%) reported that BMI range of obesity is ≥ 30. Also, 547 (60.6%) believed that they know about the indications of SG. Participants who identified the correct indications "adult with BMI > 40", "adult with BMI >35 and severe comorbidities" and "adult with BMI> 30 " with poorly type 2 DM, increased risk of CVS " were 91%, 81.2%, 73.7%, respectively.

Additionally, about 573 (63.5%) reported that they know about the complications of SG. The most known complications were Other nutritional and mineral Deficiency (92%), Leak of gastric content (83.4%), Iron deficiency (82.5%), and Weight regain (70.9%). The least known were pulmonary emboli (49.6%) and Neuropathies (45.5%).

Table2; Awareness of indications and complications of sleeve gastrectomy among obese and overweight people in Saudi Arabia

Awareness regarding sleeve gastrectomy	No	%
Did you hear about sleeve gastrectomy?		
Yes	882	97.8%
No	20	2.2%
Have you heard about the BMI?		
Yes	751	83.3%
No	151	16.7%
What is the BMI range that we can say this person is obese?		
< 18.5	12	1.3%
18.5-24.9	46	5.1%
25-29.9	95	10.5%
≥ 30	452	50.1%
I don't know	297	32.9%
Do you know about the indications of sleeve gastrectomy?		
Yes	547	60.6%
No	355	39.4%
Indications		
Adult with BMI >40 (Yes)	498	91.0%
Adult with BMI >35 and severe co-morbidities (Yes)	444	81.2%
Adult with BMI >30, poorly controlled type 2 diabetes, increased cardiovascular risk (Yes)	403	73.7%
Adult with BMI from 18.5-24.9 (No)	434	79.3%
Adult with BMI of 18.5 (No)	461	84.3%
Adult with BMI less than 18.5 (No)	462	84.5%

Awareness regarding sleeve gastrectomy	No	%
Do you know about the complications of sleeve gastrectomy?		
Yes	573	63.5%
No	329	36.5%
Complications		
Hemorrhage	454	79.2%
Leak of gastric content	478	83.4%
Abscess	327	57.1%
Iron deficiency	473	82.5%
Anemia	446	77.8%
Other nutritional and mineral Deficiency	527	92.0%
Twist of stomach	330	57.6%
Pulmonary emboli	284	49.6%
Neuropathies	261	45.5%
Weight regain	406	70.9%

Figure 1; Overall awareness level regarding sleeve gastrectomy among obese and overweight people in Saudi Arabia. A total of 420 (46.6%) had overall good awareness level while 482 (53.4%) had poor awareness level.

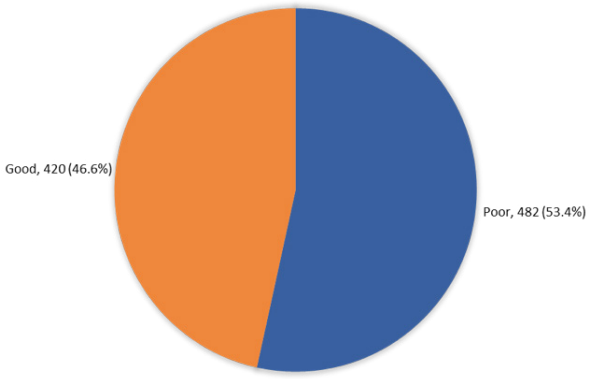


Figure1. Overall awareness level regarding sleeve gastrectomy among obese and overweight people in Saudi Arabia

Table 3; Factors associated with overweight and obese participants awareness regarding SG in Saudi Arabia. Good awareness was found among 57.7% of participants with post-graduate education compared to 39.1% of others with secondary level of education with statistical significance (P=.024). Also, 50.9% of class II obese participants had overall good awareness level versus 37.9% of class III obese participants (P=.048).

Table3; Factors associated with overweight and obese participant's awareness regarding sleeve gastrectomy in Saudi Arabia

Factors	Overall awareness level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					.223
18-25	161	55.9%	127	44.1%	
26-35	133	57.6%	98	42.4%	
36-45	110	50.5%	108	49.5%	
46-55	60	48.0%	65	52.0%	
> 55	18	45.0%	22	55.0%	
Gender					.803
Male	214	53.9%	183	46.1%	
Female	268	53.1%	237	46.9%	

Factors	Overall awareness level				p-value
	Poor		Good		
	No	%	No	%	
Education					.024*$
Below secondary	19	51.4%	18	48.6%	
Secondary	140	60.9%	90	39.1%	
University	290	52.1%	267	47.9%	
Post-graduate	33	42.3%	45	57.7%	
Body mass index					.048*
Overweight	208	52.4%	189	47.6%	
Class I obesity	21	56.8%	16	43.2%	
Class II obesity	143	49.1%	148	50.9%	
Class III obesity	110	62.1%	67	37.9%	

P: Pearson $X^{2\ test}$ $: Exact probability test * $P < 0.05$ (significant

Discussion

Proper public awareness about SG indications and complications is essential to ensuring that obese individuals will seek appropriate medical advice to reduce their weight and avoid potential consequences of obesity[1,14]. Moreover, according to literature in Saudi Arabia, SG is the only effective treatment method in about 35.5% of obese patients. Today, SG is becoming one of the most common gastrointestinal elective operations among Saudis, with 341 surgical procedures performed annually[15,16]. The present study was established to assess the awareness levels of obese and overweight people in Saudi Arabia about SG indications and complications. Our study findings indicated that half of the participants (53.4%) had overall poor levels of awareness about SG indications and complications, while the remaining showed good awareness levels. This was consistent with a study conducted in a tertiary hospital in Saudi Arabia and similar to the results of another study done in Turkey among obese patients[5,17].

However, multiple factors have been shown to affect individuals' decisions regarding this procedure, such as information consulted on Internet websites, individual experiences, having physicians in one's family, as well as one's friends and educational level[14]. A study conducted to evaluate the quality of Internet information for BS found that seeking healthcare information via the internet is the most commonly used method. The results showed that the average quality of Internet sites that provide details regarding BS was only "poor" to "fair" [14]. Thus, it is important to increase the presence of health educational programs based on the latest research

and scientific evidence of the indications and complications of SG through different internet platforms. The majority of our respondents (83.3%) have heard about BMI, consistent with a study in the Western region of Saudi Arabia[18]. This was dissimilar to a study conducted in Turkey's Kocaeli Province, which reported that 55.2% of the study sample have not heard about BMI, and a study in the Saudi Qassim region among the general population that reported participants had a lack of knowledge about BMI[5,13]. Moreover, the knowledge-related reference range of obese BMI was not satisfactory among the above studies' participants[5,18]. However, 50.1% of our study participants were well informed about the obese BMI reference range of 30 and higher.

At present SG indications are as follows: adults with a BMI of 40 kg/m2 or greater who do not have any coexisting medical illnesses; adults with a BMI >35 kg/m2 and severe co-morbidities, such as diabetes, hypertension, hyperlipidemia, obstructive sleep apnea, asthma, and venous stasis; and adults with a BMI greater than 30 kg/m2 with poorly controlled type 2 diabetes, metabolic syndrome, and increased cardiovascular risk[19-21]. In the present study, most participants were not fully aware of the indications of SG. Bariatric surgeries result in permanent anatomy alteration of the patient, which can lead to multiple complications at any time during the patient's lifetime—this includes early complications such as hemorrhage, leak of gastric content, abscess, and venous thromboembolism as well as late complications such as gallstone disease, bowel obstruction, and anemia[22]. According to the literature, anastomosis leak after SG has been identified as a complication that increases the mortality and morbidity rate by 15% and 61%, respectively[23].

Regarding our study, 83.4% of the participants understood that the leak of gastric contents was a complication. Moreover, our participants were well aware of other complications like hemorrhage, as well as other nutritional and mineral deficiencies. Participants with post-graduate education showed good awareness levels about SG indications and complications, which was similar to a study showing that participants with master's degrees and higher had high levels of awareness[18]. These facts emphasize the need for health educational programs regarding obesity and SG for all community groups, particularly those with university education and below.

Strength and limitations

This study has some limitations that should be considered. First, the potential for misunderstanding information related to SG could be a result of the use of an

online self-reported questionnaire leading to selection and recall bias. Furthermore, most of the respondents had secondary or university-level education; the response from those with education levels below the secondary and post graduate levels were insufficient.

Conclusion

Our study findings indicated that almost half of the participants were well informed regarding sleeve gastrectomy indications and complications. Moreover, participants with post-graduate degrees exhibited good levels of awareness compared to those with only a secondary level of education. However, we recommend that scientific educational health–related projects are established through campaigns or social media platforms to increase awareness of the scientific facts of SG.

References:

1. Al Watban ZH, Al Sulaiman OA, Al Suhaibani MS, Al Nafisah IY, Al Ateiq IM, Al Samil YA, et al. Patient awareness about the indications and complications of sleeve gastrectomy. Journal of Family Medicine and Primary Care. 2020 Jan;9(1):321.
2. World Health Organization. Overweight and Obesity. Available online: http://www.who.int/news-room/ fact-sheets/detail/obesity-and-overweight (accessed on 25 September 2018).
3. Panuganti KK, Nguyen M, Kshirsagar RK. Obesity. 2022 Aug 8. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2022 Jan–. PMID: 29083734.
4. Memish ZA, El Bcheraoui C, Tuffaha M, Robinson M, Daoud F, Jaber S, et al.. Peer reviewed: obesity and associated factors—Kingdom of Saudi Arabia, 2013. Preventing chronic disease. 2014;11.
5. Güler SA, Yılmaz TU, Şimşek T, Yirmibeşoğlu O, Kırnaz S, Utkan NZ, et al. Obesity and Bariatric Surgery awareness in the Kocaeli province, a leading industrial city in Turkey. Turkish Journal of Surgery. 2018;34(3):165.
6. Karmali S, Stoklossa CJ, Sharma A, Stadnyk J, Christiansen S, Cottreau D, et al. Bariatric surgery: a primer. Canadian Family Physician. 2010 Sep 1;56(9):873-9.
7. Buchwald H, Avidor Y, Braunwald E, Jensen MD, Pories W, Fahrbach K, et al. Bariatric surgery: a systematic review and meta-analysis. Jama. 2004 Oct 13;292(14):1724-37.
8. Gessler B, Eriksson O, Angenete E. Diagnosis, treatment, and consequenc-

es of anastomotic leakage in colorectal surgery. International Journal of colorectal disease. 2017 Apr;32:549-56.

9. Al-Sabah S, Ladouceur M, Christou N. Anastomotic leaks after bariatric surgery: it is the host response that matters. Surgery for Obesity and Related Diseases. 2008 Mar 1;4(2):152-7.
10. AlMarri F, Al Sabah S, Al Haddad E, Vaz JD. A call for more research from the Arabian Gulf. Obesity surgery. 2017 Aug;27(8):2034-43.
11. Alrashid FF, Alfriedy RF, Albdair RA, Alsulami EA, Alazaima AM, Alshehri AH, et al. Awareness towards obesity and bariatric surgery in Tabuk region. Med Sci. 2021;25(108):401-9.
12. Sullivan KM, Dean A, Minn MS. OpenEpi: A Web-based Epidemiologic and Statistical Calculator for Public Health. Public Health Reports. 2009 ;124(3):471.
13. Alolayan H, Aldubayyan A, Aldhohayan A, AlBassam R, Almarzuqi S, Almoqaiteb T, et al. General Public Awareness about the Indications and Complications of Sleeve Gastrectomy in Qassim Region, Saudi Arabia. Open Access Macedonian Journal of Medical Sciences. 2021 Dec 16;9(E):1517-21.
14. Akbari K, Som R. Evaluating the quality of internet information for bariatric surgery. Obes Surg 2014;24:2003-6.
15. Khorgami Z, Shoar S, Andalib A, Aminian A, Brethauer SA, Schauer PR. Trends in utilization of bariatric surgery, 2010-2014: sleeve gastrectomy dominates. Surgery for obesity and related diseases. 2017 May 1;13(5):774-8.
16. Al-Enazi N, Al-Falah H. A needs assessment of bariatric surgery services in Saudi Arabia. Saudi Journal of Obesity. 2017 Jan 1;5(1):15.
17. Alzahrani KM, Faydh JA, Althuwaybi SE, Alzahrani SS, Althobaiti FD, Althagafi BA. Patient Awareness about the indications for and complications of sleeve gastrectomy in the western region of Saudi Arabia. Middle East Journal of Family Medicine. 2022 Sep 1;7(10):26.
18. Dimitrov DV, Ivanov V, Atanasova M. Advantages of bariatric medicine for individualized prevention and treatments: multidisciplinary approach in body culture and prevention of obesity and diabetes. EPMA Journal. 2011 Sep;2:271-6.
19. Mancini MC. Bariatric surgery–An update for the endocrinologist. Arquivos Brasileiros de Endocrinologia & Metabologia. 2014;58:875-88.

20. Rubino F, Nathan DM, Eckel RH, Schauer PR, Alberti KG, Zimmet PZ, et al. Metabolic surgery in the treatment algorithm for type 2 diabetes: a joint statement by international diabetes organizations. Diabetes care. 2016 Jun 1;39(6):861-77.

21. Lim R, Beekley A, Johnson DC, Davis KA. Early and late complications of bariatric operation. Trauma Surgery & Acute Care Open. 2018;3(1).

22. Edwards MA, Jones DB, Ellsmere J, Grinbaum R, Schneider BE. Anastomotic leak following antecolic versus retrocolic laparoscopic Roux-en-Y gastric bypass for morbid obesity. Obesity surgery. 2007 Mar;17:292-7.