

Patient Awareness about the indications for and complications of sleeve gastrectomy in the western region of Saudi Arabia

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Received: July 2022 Accepted: August 2022; Published: September 1, 2022.

Citation: Khalid M. Alzahrani et al. Patient Awareness about the indications for and complications of sleeve gastrectomy in the western region of Saudi Arabia. World Family Medicine. 2022; 20(9): 26-34.

DOI: 10.5742/MEWFM.2022.9525132

Abstract

Introduction and Research Problem: Obesity can be defined as a BMI of 30 kg/m² or higher. It has been recognized as the 2nd largest cause of avoidable early mortality in the USA. Bariatric surgery is a weight-loss surgical technique that is mostly suggested for morbidly obese individuals (BMI greater than 40) without comorbidities and BMI 35 with comorbidities.

The goal of the study was to assess patient awareness about the indications for and complications of, sleeve gastrectomy, as there is an insignificant number of studies related to our topic, in Saudi Arabia.

Materials and Methods: An observational cross-sectional study conducted in the western part of Saudi Arabia. The study's population included all patients of sleeve gastrectomy from the Western Region of Saudi Arabia.

The instrument used was an electronic questionnaire, which included questions about knowledge of sleeve gastrectomy indications and complications.

Summary of Results: The questionnaire was sent to 451 patients who underwent sleeve gastrectomy, and about 444 patients gave consent to participate.

It was found that the participants who were aware of the indications and complications of sleeve gastrectomy before undergoing the procedure were 313 (70.5%) and 303 (68.2%). female patients had significantly more awareness related to the indications ($p < 0.001$) and complications ($p = 0.001$).

Patients who had an educational qualification of Masters and above had more awareness regarding indications of SG before surgery than others ($p = 0.008$).

Conclusion and Recommendations: According to the findings of our study, knowledge regarding the indications for and complications associated with sleeve gastrectomy is not satisfactory.

There is a need to raise public understanding of the indications for and consequences of, sleeve gastrectomy.

Key words: Patient awareness, indications, complications, sleeve gastrectomy, Saudi Arabia

Introduction

Obesity can be defined as a BMI of 30 kg/m² or higher, and it can affect people of all ages [1]. Obesity, second only to smoking, has been recognized as the largest cause of avoidable early mortality in the United States [2]. The general population is divided into five groups based on BMI: underweight (BMI 18.5 kg/m²), normal weight (BMI 18.5-24.9 kg/m²), class I obesity-overweight (BMI 25.0-29.9 kg/m²), class II obesity-obesity (BMI 30.0-39.9 kg/m²), and class III obesity-extreme obesity (BMI > 40 kg/m²) [3]. Bariatric surgery is a weight-loss surgical technique that is mostly suggested for morbidly obese individuals (BMI greater than 40) without comorbidities and BMI 35 with comorbidities [4].

Despite the fact that bariatric surgery is the only treatment technique linked with large and quick weight loss, it is a costly procedure and surgeon-specific, and certainly not the solution to the rising obesity pandemic [5]. Roux-en-Y gastric bypass (RYGB) and vertical sleeve gastrectomy (VSG) are the two most prevalent bariatric procedures. In both procedures, the surgeon physically modifies the gastrointestinal tract's natural integrity, shrinking the stomach to a fraction of its original size, between 80 and 120 mL in VSG and 20 to 30 mL in RYGB. The proximal jejunum is also transected, the Roux limb is attached to the gastric pouch, and the stomach, duodenum, and proximal jejunum are reattached to the distal jejunum in RYGB [6]. LAGB's popularity has dropped dramatically in recent years as a result of disappointing long-term results and high reoperation rates due to problems (e.g., slippage, pouch dilatation, dysphagia, and erosion). Meanwhile, LSG is becoming increasingly popular [7].

According to the World Health Organization statistics from 2016, around 13% of the world's adult population (male: 11%; female: 15%) was obese [8]. Habib conducted the study in Saudi Arabia in 2013, with the goal of assessing the prevalence of obesity in the Saudi adult population using international standards of body mass index (BMI) and body fat percentage (BF percent). According to the findings, the prevalence of obesity in Saudi adults according to the BMI criteria (30 kg/m² and above) was 33.8 %, but the prevalence of obesity in Saudi people according to the BF percent criteria (25% for males and 30% for females) was 60 % [9]. Despite its effectiveness, bariatric surgery has been linked to a number of acute problems, including bleeding, leak, pulmonary embolism, intestinal perforation, gastric obstruction, infection, pneumonia, vomiting, dysphagia, reflux, heartburn, and dehydration, which have been recorded in 0.3 percent to 8% of operations [4].

A study was conducted in King Khalid University Hospital, Riyadh, Saudi Arabia in 2017 to assess patient awareness about the indications and complications of sleeve gastrectomy. It revealed that the majority of the participants (59.0%) didn't know about sleeve gastrectomy indications; however, 311 (64.8%) of the participants had heard about the complications of sleeve gastrectomy. All

these results are correlated with the educational level of the participants [1]. An internet-based survey was done in 2019 to assess the patient's awareness of potential risks of weight reduction surgery of the surveyed population; 64% reported being aware of acute complications of bariatric surgery. Participants who had previously undergone a bariatric operation had a far better degree of awareness as compared to people who had not undergone a bariatric operation before (80.4% vs. 61.3%). Females had higher awareness compared to males [4]. Research been conducted in Taif City Saudi Arabia in 2020 shows that 32.25% and 42.6% of the participants were very satisfied with the general appearance and weight loss respectively. There was also a huge percentage of reduction of comorbidities like hypertension and Type 2 diabetes mellitus after the surgery [10]. As a result, the goal of this study is to assess patient awareness about the indications for and complications of sleeve gastrectomy, as there is an insignificant number of studies related to our topic, especially in Saudi Arabia.

Methodology

This was an observational cross-sectional study conducted in the western part of Saudi Arabia. The study's population included all patients of sleeve gastrectomy from the Western Region of Saudi Arabia. Participants were recruited during November 2021 from the general population of Western Region of Saudi Arabia. The number of participants was 384 estimated by sample size calculator, with 95% confidence level and 5% margin of error. The instrument used was an electronic questionnaire in English translated to Arabic, which included questions about knowledge of sleeve gastrectomy indications and complications. This questionnaire was taken from previous research that was conducted at King Khalid University Hospital (KKUH), a tertiary care center in Riyadh, Saudi Arabia. The questionnaire was divided into five main sections: the first section was for research description and participant consent, the second section was for demographic data, the third section consisted of questions assessing the general knowledge of SG, the fourth section contained questions assessing the knowledge of SG indications, and the fifth section consisted of questions assessing the knowledge of SG complications.

Statistics

Statistical analysis was performed using SPSS version 23 (IBM corp. USA). Statistical analysis was performed using the Chi-square test for categorical variables. Patient characteristics and surgical complications were compared using the Chi-square test.

A p-value of less than 0.05 was regarded as statistically significant.

Results

The questionnaire was sent to 451 patients who underwent sleeve gastrectomy, and about 444 patients gave consent to participate. The sociodemographic characteristics of the patients showed that 40.3% were 18-24 years of age, 52% were females, and 57% had bachelor's education [Table 1].

The analysis showed that 347 (78.2%) patients were aware of their own Body Mass Index (BMI). It was found that patients aged 18-24 years, 25-34 years, and 35-44 years were comparatively more aware of their BMI than other age groups ($p<0.001$). There were no statistical gender differences related to awareness of their own BMI ($p=0.560$). Participants with higher educational qualifications such as Masters and above and Bachelors were significantly more aware of their BMI than others ($p=0.005$) [Table 2].

When we assessed the knowledge related to BMI, it was found that 245 participants (55.2%) had correct knowledge. Participants belonging to the age group of 18-24 years, 25-34 years, and 35-44 years significantly had

more knowledge related to BMI than other age groups ($p<0.001$). Also, females had significantly better knowledge than males ($p=0.044$). Although participants with educational qualifications of Masters and above had better knowledge, there were no statistically significant differences observed between the other educational qualifications of participants ($p=0.359$). It was found that the participants who were aware of the indications and complications of sleeve gastrectomy before undergoing the procedure were 313 (70.5%) and 303 (68.2%), respectively. The participants' responses related to indications and complications of sleeve gastrectomy are given in Table 4. It was observed that patients who belonged to the age group of 45-54 years and 55-64 years were comparatively more aware of the indications ($p=0.001$) and complications ($p=0.002$) before the procedure than others. Similarly, female patients had significantly more awareness related to the indications ($p<0.001$) and complications ($p=0.001$) before the procedure, than males. Patients who had an educational qualification of Masters and above had more awareness regarding indications of SG before surgery than others ($p=0.008$) [Table 4].

Table 1: baseline characteristics of participants

		Frequency	Percent
Age (years)	<18	11	2.5
	18-24	179	40.3
	25-34	107	24.1
	35-44	96	21.6
	45-54	36	8.1
	55-64	14	3.2
	>65	1	.2
Gender	Female	231	52.0
	Male	213	48.0
Educational Level	Masters and Above	18	4.1
	Bachelors	253	57.0
	Diploma	35	7.9
	High school	123	27.7
	Middle school and lower	15	3.4

Table 2: Relationship between self BMI and baseline characteristics					
			Awareness of self BMI		P value
			No	Yes	
Age	<18	N	7	4	<0.001
		%	63.6%	36.4%	
	18-24	N	35	144	
		%	19.6%	80.4%	
	25-34	N	18	89	
		%	16.8%	83.2%	
	35-44	N	16	80	
		%	16.7%	83.3%	
	45-54	N	14	22	
		%	38.9%	61.1%	
55-64	N	6	8		
	%	42.9%	57.1%		
>65	N	1	0		
	%	100.0%	0.0%		
Gender	Female	N	53	178	0.560
		%	22.9%	77.1%	
	Male	N	44	169	
		%	20.7%	79.3%	
Educational level	Masters and Above	N	1	17	0.005
		%	5.6%	94.4%	
	Bachelors	N	47	206	
		%	18.6%	81.4%	
	Diploma	N	8	27	
		%	22.9%	77.1%	
	High school	N	33	90	
		%	26.8%	73.2%	
Middle school and lower	N	8	7		
	%	53.3%	46.7%		

Table 3: Participants knowledge regarding obesity and their baseline characteristics (Chi-square test)

			Knowledge related to BMI		P value
			Wrong	Correct	
Age	<18	N	10	1	<0.001
		%	90.9%	9.1%	
	18-24	N	93	86	
		%	52.0%	48.0%	
	25-34	N	37	70	
		%	34.6%	65.4%	
	35-44	N	33	63	
		%	34.4%	65.6%	
	45-54	N	15	21	
		%	41.7%	58.3%	
	55-64	N	10	4	
		%	71.4%	28.6%	
	>65	N	1	0	
		%	100.0%	0.0%	
Gender	Female	N	93	138	0.044
		%	40.3%	59.7%	
	Male	N	106	107	
		%	49.8%	50.2%	
Educational level	Masters and Above	N	6	12	0.359
		%	33.3%	66.7%	
	Bachelors	N	110	143	
		%	43.5%	56.5%	
	Diploma	N	15	20	
		%	42.9%	57.1%	
	High school	N	58	65	
		%	47.2%	52.8%	
	Middle school and lower	N	10	5	
		%	66.7%	33.3%	

Table 4: Responses of participants for indications and complications of sleeve gastrectomy		N (%)
Awareness of indications of sleeve gastrectomy before surgery		313 (70.5%)
Indications of Sleeve gastrectomy	Adults with a BMI over 40*	278 (61.5%)
	Adults with a body mass index (BMI) of more than 35 and pre-existing chronic diseases*	256 (56.8%)
	Adults with a body mass index (BMI) of more than 30 and diabetes and cardiovascular disease*	234 (51.9%)
	Adults with a body mass index (BMI) between 18.5-24.9	41 (9.1%)
	Adults with a body mass index (BMI) of 18.5	22 (4.9%)
	Only adults with a body mass index (BMI) <18.5	7 (1.6%)
	For cosmetic purposes*	66 (14.6%)
	Awareness of complications of sleeve gastrectomy before surgery	
Complications of sleeve gastrectomy	Anemia*	176 (39%)
	Nutritional and mineral deficiencies	184 (40.8%)
	Mental stress	74 (16.4%)
	Internal bleeding*	208 (46.1%)
	Iron deficiency*	232 (51.4%)
	Overweight	58 (12.9%)
	Pulmonary vessel obstruction*	62 (13.7%)
	Stomach leakage*	240 (53.2%)
	Suppuration (pus collection) after surgery*	240 (53.2%)
	Wrapping the stomach around itself	159 (35.3%)

* correct responses

Table 5: Participants knowledge regarding obesity and their baseline characteristics (Chi-square test)

			Awareness of indications of SG before surgery			Awareness of complications of SG before surgery		
			No	Yes	P value	No	Yes	P value
Age	<18	N	4	7	0.001	4	7	0.002
		%	36.4%	63.6%		36.4%	63.6%	
	18-24	N	76	103		71	108	
		%	42.5%	57.5%		39.7%	60.3%	
	25-34	N	22	85		24	83	
		%	20.6%	79.4%		22.4%	77.6%	
	35-44	N	30	66		22	74	
		%	31.3%	68.8%		22.9%	77.1%	
	45-54	N	5	31		5	31	
		%	13.9%	86.1%		13.9%	86.1%	
	55-64	N	3	11		4	10	
		%	21.4%	78.6%		28.6%	71.4%	
	>65	N	1	0		1	0	
		%	100.0%	0.0%		100.0%	0.0%	
Gender	Female	N	53	178	<0.001	52	179	0.001
		%	22.9%	77.1%		22.5%	77.5%	
	Male	N	88	125		79	134	
		%	41.3%	58.7%		37.1%	62.9%	
Educational level	Masters and Above	N	3	15	0.008	2	16	0.213
		%	16.7%	83.3%		11.1%	88.9%	
	Bachelors	N	73	180		76	177	
		%	28.9%	71.1%		30.0%	70.0%	
	Diploma	N	7	28		7	28	
		%	20.0%	80.0%		20.0%	80.0%	
	High school	N	54	69		40	83	
		%	43.9%	56.1%		32.5%	67.5%	
	Middle school and lower	N	4	11		6	9	
		%	26.7%	73.3%		40.0%	60.0%	

Discussion

People who are going to undergo bariatric surgical procedures like sleeve gastrectomy need to have good knowledge related to the procedures. The present study with 444 patients showed that more than three quarters of them were aware of their own BMI. However, the knowledge related to the reference range of obese BMI was not satisfactory among the patients. A similar study conducted in Riyadh showed similar findings where only 16.7% of the participants were aware of the obese BMI [11]. According to a study by Yang et al., the rate of withdrawal from a bariatric surgery program is 25 % due to a variety of factors, including awareness of the surgical risks and complications, post-surgery lifestyle change, and lack of communication with the primary care physician [12]. The ability of physicians to educate patients about their BMI may motivate them to make lifestyle changes after the procedure, thereby assisting the patients in maintaining a normal BMI and reducing complications associated with it [13]. A discussion about BMI may be beneficial in addressing patients' misconceptions about their own weight and weight status. This is supported by our findings where patients with higher educational qualifications had greater BMI knowledge than those with lower educational qualifications. It may be because people with higher educational qualifications may inquire about the need and complications of the body procedures that they are planning to undergo [14]. Despite evidence that low health literacy is associated with poor health outcomes, evidence that it is associated with obesity is inconsistent and insufficient, according to a systematic review by Berkman et al. [15]. In general, it is reported that people are unaware of their own BMI category and have an inaccurate perception of their own weight, with the degree of inaccuracy increasing as BMI rises in the scale [16]. It is reported that secondary healthcare providers who are concerned about some patients' medical and surgical complications after bariatric surgery were reluctant to refer the patients for the same procedure [17].

Sleeve gastrectomy indications are based on BMI and the presence of comorbidity. Patients with a BMI of 40 kg/m² or greater who do not have any coexisting medical problems and for whom weight loss surgery would not pose an enormous risk should be considered candidates for one of the aforementioned surgeries. BMI >35 kg/m² with one or more severe obesity-related comorbidities (type 2 diabetes, hypertension, hyperlipidemia, obstructive sleep apnea, gastroesophageal reflux disease, non-alcoholic fatty liver disease, asthma, venous stasis, severe urinary incontinence, debilitating arthritis, or significantly reduced quality of life) would also qualify as surgical candidates. Patients with a BMI of 30 to 34.9 kg/m² and diabetes or metabolic syndrome may also undergo bariatric surgery, though data on long-term benefits is lacking [18,19]. Candidates' comorbidities put them at risk for complications when done under general anesthesia and having surgery. Bariatric surgery complications can occur during surgery, 1–2 days postoperatively, or even years later. Intraoperative complications include anesthesia-

related incidents, intestinal, spleen, liver injury, and blood vessel injuries [20,21]. The most dangerous bariatric complication is an anastomotic leak, which increases overall morbidity by 61% and mortality by 15% [22]. In our study, only 53.6% of the participants selected stomach content leakage as a complication of SG. The present study showed that 70.5% of the participants were aware of the indications of SG before surgery, whereas female patients and those having educational qualifications of Masters and above were more aware of the indications and complications than others. A study conducted in the Qassim region of Saudi Arabia among the general population reported that even though the participants lacked knowledge about BMI, their awareness toward the indications and complications of SG was fair [23]. The patient-physician relationship must be improved, where the physicians need to communicate with the patients before and after surgery in order to increase awareness about SG indications and complications. To achieve desirable weight loss, obesity should be managed through a multidisciplinary team that should include primary care providers, bariatric surgeons, family physicians, and health educators.

Some of the limitations should be considered before generalizing the findings. Firstly, the study was limited to the Taif region of Saudi Arabia, and hence it may not reflect the whole patient population in Saudi Arabia that are ideal candidates for SG. Another possibility is that our study may have called upon social desirability bias in some of the participants due to the fact that there is a tendency to under-report socially undesirable attitudes and behaviors while over-reporting more desirable characteristics.

Conclusion

According to the findings of our study, knowledge regarding the indications for and complications associated with sleeve gastrectomy is not satisfactory. Patients who had higher educational qualifications and female patients were more aware of their Body Mass Index. There is a need to raise public awareness about the indications and complications of sleeve gastrectomy through appropriate community scientific health education programs.

Acknowledgement: My sincere thanks go to Professor Khalid Alzahrani for guiding this work. I would like to thank the Data Collectors at the college of medicine Taif University and also thank Dr. Zaki AlWatban for help us regarding the questionnaire.

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