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Research Article

ASSESSING THE IMPROVEMENT IN QUALITY OF LIFE AND OBESITY-RELATED CO-MORBIDITIES AMONG PEOPLE WHO UNDERWENT LAPAROSCOPIC SLEEVE GASTRECTOMY IN QASSIM, SAUDI ARABIA.

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Abstract:

Objectives: Although weight loss is the main goal in bariatric surgeries, it is not the only criteria for success. It is necessary to assess patients' Quality of Life (QOL) and overall improvement after Laparoscopic Sleeve Gastrectomy (LSG). Many studies suggest QOL improves following LSG. This study aimed to assess the improvement in QOL and obesity-related co-morbidities post LSG.

Methods: A prospective descriptive study was conducted using records of 120 patients who underwent LSG between 2011 and 2017 at three different hospitals in the Qassim region. The BAROS questionnaire was used to assess QOL post-surgery. Patient Health Questionnaire -9 was used to assess depression. The SF-8 Health Survey was also used. Data analysis was carried out using SPSS version 21 and descriptive statistics were used to characterize the patients. We used chi-square for categorical variables and t-test for continuous variables. P-values <0.05 were considered significant.

Results: The total BAROS score in 120 patients was n=7(5.8%) failure, n=17(14.2%) fair, n=29 (24.2%) good, n=43 (35.8%) very good, n=24 (20%) excellent. The percentage of excess weight loss was $80.27 \pm 21.79\%$. The QOL score in regard to physical activity, social life, ability to work, and sexual life suggested that most patients showed great improvement except in sexual interest. The most common obesity-related comorbidity was osteoarthritis (27.5%).

Conclusions: LSG is a very effective and safe procedure for reducing excess body weight, improving obesity-related comorbidities, and improving QOL in obese individuals.

Key Words: QOL, LSG, Obesity, improvement, BAROS.

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INTRODUCTION:

The high prevalence of obesity globally has led to serious problems and co-morbidities. Overweight and obesity with their associated medical conditions have greatly increased¹. Excessive fat in the body is referred to as overweight and obesity².

The World Health Organization (WHO) categorizes obesity and overweight in adults as Overweight means Body mass index (BMI) equal to or greater than twenty-five and Obesity means BMI equal to or greater than thirty.

According to the World Health Organization's projections, the rising trend is even more concerning because it is estimated that by 2030, approximately two-thirds of the world population would be overweight or obese (2.2/3.3 billion)¹

According to WHO global rating facts that in 2016, more than 1.9 billion adults aged 18 and above were considered overweight, with over 650 million of these adults being obese, in 2016, 13% of adults globally (11% male and 15% female) were obese, and in 2016, 39% of adults aged eighteen and above (39% male and 40% female) were overweight².

Between 1975 and 2016 the prevalence of obesity was very high and tripled and developed countries have a higher prevalence of death from over-weight and obesity than under-weight².

In 2016, 41 million children less than 5 years old were overweight or obese. In 2016, 340 million children and adolescents aged 5 to 19 were overweight or obese prevalence increased from 4% in 1975 to 80% in 2016. Obesity can be prevented².

A study of 10,735 participants in Saudi Arabia estimated 28.7% were obese (BMI ≥ 30 kg/m²) the prevalence of obesity was greater among women than men (33.5% vs 24.1%)³. Obesity is a major risk factor for non-infectious diseases: Cardiovascular diseases: In 2012 one of the leading causes of death was cardiovascular diseases (mainly heart disease and stroke), diabetes, musculoskeletal diseases (such as osteoarthritis), and some types of cancers (such as endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon)²

High BMI increases the risk of these non-infectious diseases². Also, morbid obesity is related to other medical conditions leading to reduced life expectancy, poor QOL, and high mortality rates⁴. Bariatric (weight reducing) surgeries for obesity are considered when other treatment options have failed⁵. Severely obese patients who cannot control their

obesity with lifestyle modification, healthy diet, or medications are qualified for surgical weight loss interventions including: gastric banding, sleeve gastrectomy, Roux-en-Y gastric bypass, and biliopancreatic diversion with or without a duodenal switch to yield long-term outcomes⁶. Although weight loss is the main goal for these kinds of surgeries, it is still not the only criteria for successful results following bariatric surgery; hence, improvement of related comorbidities and quality of life are needed^{7,8}. The bariatric analysis and reporting outcome system (BAROS) is an effective system in the total evaluation of outcomes after bariatric surgery procedures^{7,8,9}. Laparoscopic Sleeve Gastrectomy (LSG) is currently the commonest type of bariatric surgery according to a survey conducted at the fourth international consensus summit on sleeve gastrectomy by the Herbert Wertheim College of Medicine, Florida International University, USA in 2013. They stated that LSG is a relatively safe procedure, but it needs further long-term surveillance¹⁰. Furthermore, a study conducted in August 2011 found that LSG is an effective and safe procedure with positive quality of life changes as well as weight loss¹¹. Health-related quality of life will be improved after sleeve gastrectomy according to a study conducted in France in 2016¹². In this study, we aimed to assess the improvement in QOL and obesity-related co-morbidities among people who had undergone LSG.

METHODS:

This study was approved by the Regional Research Ethics Committee, registered at the National Committee of Bio & Med in Qassim, Saudi Arabia. A Prospective descriptive study was conducted using records of a total of 120 patients who underwent Laparoscopic sleeve gastrectomy (LSG) between 2011 and 2017 at three different hospitals in the Qassim region. A total of 120 patient files were collected, 40 from King Fahad Specialist Hospital, 75 from Buridah Central Hospital and 5 from Alrass General Hospital, Departments of Surgery in the Qassim region of Saudi Arabia. Patients of Saudi and non-Saudi nationality with morbid obesity who had the surgery in one of the selected hospitals were included in this study and were classified according to the Bariatric Analysis and Reporting Outcome System (BAROS) criteria of evaluating QOL after bariatric surgeries into two groups. One group included the patients who had obesity related co-morbidities and the other group included the patients without co-morbidities. Those that had other surgical procedure such as gall stones, appendicitis...etc., and those who didn't respond were excluded. The BAROS questionnaire was used to assess QOL after

the surgery. Patient Health Questionnaire -9 (PH-Q9) was used to assess depression, and we consulted the SF-8 Health Survey. All of these questionnaires were administered to the patients by telephone interviews after obtaining their consent using the registered phone number in their files from the selected hospitals. Data entry and statistical analysis were performed using statistical package for social sciences (SPSS) version 21 and descriptive statistics were used to characterize the sampled patients. We used chi-square for categorical variables and the t-test for continues variables. A p-value of 0.05 was used to determine significance (P-values <0.05 were considered significant).

RESULTS:

In this study, we aimed to assess the improvement in QOL and obesity-related co-morbidities among people who underwent LSG depending on many variables. This study involved 120 obese patients. Most of the study participants were females 88(73.3%) and 32(26.7%) were males. The average age was 31.45 ± 8.74 years. Only one patient was non-Saudi the others were Saudis. This data and other demographics including average weight (kg), BMI (kg/m^2) “before and after” LSG, and the percentage of excess weight loss (%EWL) are summarized in Table 1.

Table 1: Demographic data of 120 patients who underwent Laparoscopic Sleeve gastrectomy (LSG).

Variables	Total (n=120)
Gender n (%)	
Male	32(26.7%)
Female	88(73.3%)
Marital status n (%)	
Single	57 (47.5%)
Married	59 (49.2%)
Other	4 (3.3%)
Profession n (%)	
Student	27(22.5%)
Worker	48(40%)
Unemployed	45(37.5%)
Age (Mean \pm SD)	(31.45 \pm 8.74)
Previous weight (Mean\pmSD)	(113.27 \pm 22.35)
Previous BMI (Mean\pmSD)	(43.09 \pm 5.78)
Current weigh (Mean\pmSD)	(73.94 \pm 13.31)
Current BMI (Mean\pmSD)	(28.41 \pm 5.33)
% EWL * (Mean\pmSD)	(80.27 \pm 21.79)

$\%EWL = \text{Previous BMI} - \text{Current BMI} * 100 / (\text{Previous BMI} - \text{Ideal BMI})$ {Ideal BMI = 25 kg/m^2 }

The gender of the patients was not statistically significant with %EWL (P-value = 0.178).

Table 2 shows the BAROS score of 120 patients that underwent LSG classified into two groups. For the group with co-morbidities n=77 (64.2%): n=6(5%) were categorized as failure, n=12(10%) as fair, n=21 (17.5%) as good, n=28 (23.3%) as very good, n=10(8.3%) as excellent, and the average was 4.50 ± 2.27 . The other group included those without co-morbidities n=43 (35.8%): n=1 (0.8%) were categorized as failure, n=5 (4.2%) as fair, n=8 (6.7%) as good, n=15 (12.5%) as very good, n=14 (11.7%) as excellent, and the average was 3.52 ± 1.58 . The total BAROS score of both groups n=120 (100%) was as follows: n=7 (5.8%) were categorized as failure, n=17 (14.2%) as fair, n=29 (24.2%) as good, n=43 (35.8%) as very good, and n=24 (20%) as excellent. The score of the majority of patients in both groups was very good. There was no statistically significant difference between the score of males and females (P-value = 0.009 in the group with co-morbidities and P-value = 0.752 in the group without).

Table 2: Total BAROS score of the two groups with and without co-morbidities (Mean± SD), n (%).

BAROS score (Mean± SD)	With co-morbidities (4.50±2.27)	Without co-morbidities (3.52±1.58)	Total
Failure	6 (5%)	1 (0.8%)	7 (5.8%)
Fair	12 (10%)	5 (4.2%)	17 (14.2%)
Good	21 (17.5%)	8 (6.7%)	29 (24.2%)
Very Good	28 (23.3%)	15 (12.5%)	43 (35.8%)
Excellent	10(8.3%)	14 (11.7%)	24 (20%)
Total	n= 77 (64.2%)	n= 43 (35.8%)	n=120 (100%)

In regard to obesity-related comorbidities among the 120 patients, the most common comorbidity among those who presented with co-morbidities was osteoarthritis in 33 patients (27.5%). The p-value was highly significant in the result of all co-morbidities, except infertility and lower extremity venous stasis, which suggested no statistically significant difference. The improvement rates of these obesity-related co-morbidities are shown in Table 3.

Table 3: Improvement level of obesity-related co-morbidities after LSG.

Co-morbidities	%	Total	Unchanged	Improved	Resolved	p-value
Hypertension	12.5%	15	1	2	12	0.001*
Dyslipidemia	11.7%	14	1	2	11	0.002*
Diabetes mellitus type 2	11.7%	14	0	2	12	0.001*
Cardiovascular disease	3.3%	4	0	1	3	0.010*
Sleep apnea	19.2%	23	3	5	15	0.001*
Obesity hypoventilation syndrome	26.7%	32	2	11	19	0.001*
Osteoarthritis	27.5%	33	2	6	25	0.001*
Infertility	5%	6	0	1	5	0.054
Idiopathic intracranial hypertension	2.5%	3	0	0	3	0.008*
Lower extremity venous stasis	7.5%	9	1	3	5	0.089
Gastroesophageal reflux disease	26.7%	32	1	16	15	0.001*

*P-value is significant (Improved=patients able to control the disease with a reduced dosage of medications, resolved=complete resolution of the disease)

Figure 1 shows the score of QOL of 120 patients who underwent LSG as follows: Physical activity n=2 (2%) “much less”, n=4 (3%) “less”, n=10 (8%) “the same”, n=46 (38%) “more”, n=58 (48%) “much more”; social life n=1 (1%) “much less”, n=10 (8%) “less”, n=30 (25%) “the same”, n=31 (26%) “more”, n=48 (40%) “much more”; ability to work n=2 (2%) “much less”, n=6 (5%) “less”, n=25 (21%) “the same”, n=37 (31%) “more”, n=50 (42%) “much more”; sexual life n=9 (8%) “much less”, n=6 (5%) “less”, n=69 (58%) “the same”, n=14 (12%) “more”, n=22 (18%) “much more”. In addition to this score, n=5 (4%) stated that they “feel worse” now compared to before the surgery, n= 4 (3%) “feel the same”, n= 38 (32%) “feel better”, and n= 73 (61%) “feel much

Figure Legends:

Figure 1: Score of QOL of 120 patients who underwent LSG.

Figure 2: Total PHQ-9 score in males and females.

better” (Not shown in the figure).Figure 2 describes PHQ-9 total score of 120 patients: n=77 (64%) had no depression [24 (75%) males and 53 (60%) females], n=30 (25%) had minimal symptoms [6 (19%) males and 24 (27%) females], n=10 (8%) had minor depression [2 (6%) males and 8 (9%) females], n=3 (3%) had major depression [no males & 3 (3%) females] after LSG. PHQ-9 total score showed no difference between males and females who developed depression after LSG (P-value = 0.424).The majority of complications after LSG were not serious and could be treated easily. The hair loss accounted for 65% followed by metabolic deficiency 56% in the majority of patients.

Figure 1

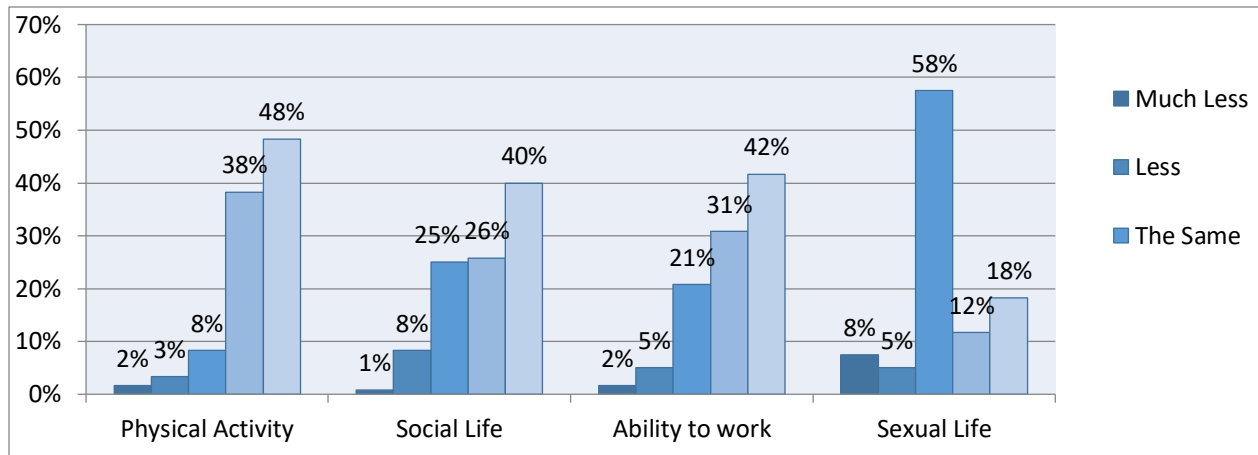
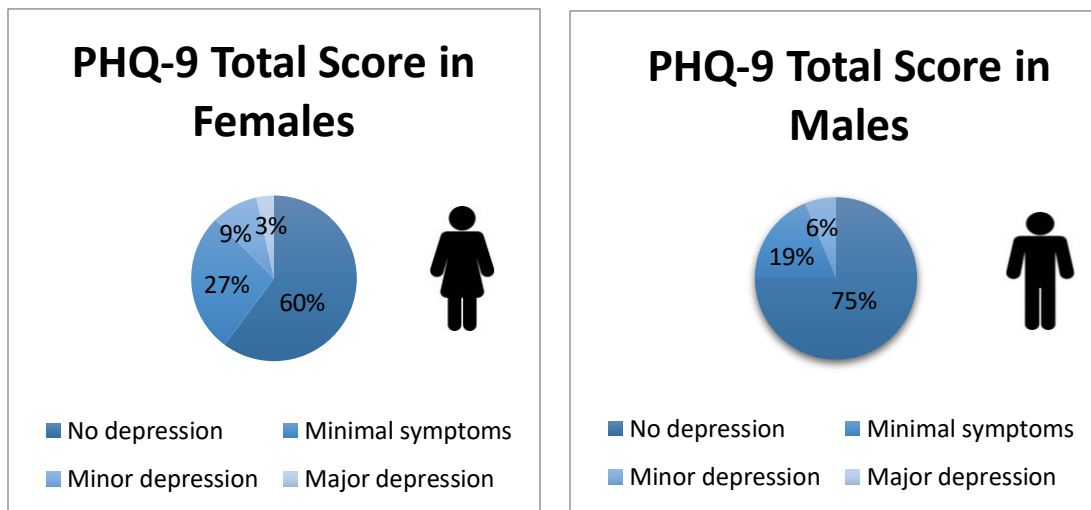


Figure 2



DISCUSSION:

In this study, we aimed to assess the improvement in QOL and obesity-related co-morbidities among people who underwent LSG depending on many variables. The total BAROS score in patients with co-morbidities was higher than those without (64.2% compared to only 35.8%). We believe that this is more applicable when serious obesity-related co-morbidities that may increase mortality rate are present. The score of majority of the patients in our study was very good (35%), similar to another study conducted in Brazil¹³ which was also very good 40.43%. However, the failure rate in our study was approximately 5.8% (7 patients had poor outcomes after the surgery) whereas in the Brazilian study there was no failure (no patient had a score in the “bad” category). In another study¹ which conducted an assessment of QOL in patients who underwent Roux-en-Y gastric bypass (RYGB) the score was also excellent (44.2%) There was no failure reported. The

total BAROS score was “good” 45.9% and there was a failure rate of 3.8% (approximately 6 patients who had poor outcomes after the surgery) in a study conducted in Saudi Arabia comparing the QOL between different types of bariatric surgeries¹⁴.

The average %EWL in this study was 80.27 % ± 21.79% which showed less weight reduction after the surgery than a study conducted to assess QOL between different types of bariatric surgeries which was 74.6±15.9¹, with the standard deviation showing higher variation than the one in that study which means more variations in the sample we selected. There was more reduction in excess weight in the study conducted in Brazil¹³ which used similar methods in assessing the patients who underwent LSG (85.46 ± 23.6) This result shows a greater mean and standard deviation. The large standard deviation suggest that they have more variation in their sample regarding % EWL result. The gender of the patients was not a statistically significant factor in % EWL

“ $P > 0.05$ ” which is similar to the Brazilian study¹³, while other studies showed that it was statistically significant¹. The average current weight in this study was 73.94 ± 13.31 kg. This differs from the Brazil study by greater weight reduction after surgery¹³ as their result showed that the average weight after the surgery was 80.1 ± 17.25 . While less in weight reduction than another study¹ which was 78.5 ± 16.8 , the study conducted in Saudi Arabia was 85.52 ± 23.37 ¹⁴. All the studies showed a high standard deviation which means more variation in their sample. Average current BMI in this study was 28.41 ± 5.33 kg/m², while in the Brazilian study, average BMI after the surgery was 28.48 ± 4.89 ¹³ which is similar to that in this study. In another study, it was slightly different at approximately 28.9 ± 4.8 ⁽¹⁾. The score of QOL in this study in regard to physical activity, social life, ability to work, and sexual life suggested that most of the patients showed great improvement except in the sexual interest as most of the patients stated that it was “the same”. This was a similar finding in the Brazilian study¹³ as their result suggested that the majority of the patients showed great improvement except in the sexual and social life domains which also most of the patients stated were “unchanged”. In the same study, there was a similar result as they reported that the majority of the patients showed “very good” outcomes. The results of this study agree with most of the studies which were conducted to assess QOL after bariatric surgery suggesting a good outcome after these surgeries in regard to QOL and high level of satisfaction following these kind of surgeries^{1,13-16}. In regards, to obesity-related comorbidities among the 120 patients, the most common comorbidity in the co-morbidity group was osteoarthritis 27.5% which is similar to the Brazilian study¹³. While in another study it was cardiovascular disease (CVD) 40%¹. The patients who did not have any co-morbidities in this study were only 43 (35.8%), in comparison to the same study mentioned earlier who were approximately 49 out of 120 (92%)¹. The majority of complications after LSG were not serious and could be treated easily. Hair loss accounted for 65% followed by metabolic deficiency 56% in the majority of patients. In another study anemia accounted for 5.8%¹. Nausea was 6.9% in the study conducted in Saudi Arabia¹⁴. Only three persons developed major depression in this study, and they all were females. This indicates that females have a higher rate than males in developing depression several years after the surgery perhaps due to dissatisfaction with their body shape. Comparing this result with other studies which showed only one person developed depression after the surgery^{1,14}, both studies did not mention if the person who developed depression was male or

female. The limitations of this study include that some of the hospitals were not cooperative and we faced a lot of difficulties with obtaining their consent. We also had problems in dealing with the patients’ files as some of the data was missing. Moreover we faced some difficulties in contacting some patients as some of them did not respond.

CONCLUSION:

LSG is a very effective and safe procedure for reducing excess body weight, improving obesity-related comorbidities, and improving QOL in obese individuals. We recommend that the assessment of QOL should be carried out in different postoperative periods for each patient to obtain more accurate results.

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