

The Impact of Gastric Sleeve on Quality of Life in Obese Adult Patients At King Fahad Hospital, Jeddah, 2017

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ABSTRACT

Background: Obese patients have lower Health Related Quality of Life (HRQoL) scores than the general population. Weight loss is associated with improvements in different quality of life domains. To achieve weight loss, common approaches include the gastric sleeve procedure.

Objective: To assess the Quality of Life (QoL) in adult obese patients (> 18years old) who have undergone the gastric sleeve procedure at King Fahd General Hospital in Jeddah, 2017.

Methodology: A Quasi-experimental study was done among 91 adult obese patients. To assess Quality of Life (QoL) and also take anthropometric measurements in participants that fit our criteria, Short Form 36 (SF-36) was completed before and 3 months after the gastric sleeve procedure. Student's Paired t-test was used in our statistical analysis.

Results: We had a response rate of 81.3% (n=74) for sleeve patients. The gastric sleeve intervention resulted in improvements in all SF-36 domains of the QoL. Global QoL significantly ($p < .05$) increased from mean \pm SD values of 58.0 ± 16.7 up to 77.7 ± 15.3 .

Conclusion: The gastric sleeve is associated with improvement in all of QoL domains but mostly in role limitation

in physical and emotional health. That effect was observed as early as 3 months.

Keywords: Quality Of Life, Obesity, Adult, Gastric Sleeve, Short Form 36.

Abbreviations:

BMI: Body Mass Index; **LSG:** Laparoscopic Sleeve Gastrectomy; **QoL:** Quality of Life; **HRQoL:** Health Related Quality of Life; **SF-36:** Short-form 36-elements; **RAND:** Research And Development Corporation.

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INTRODUCTION

Obesity is defined as an abnormal or excessive accumulation of fat and is known as increase risks to health.¹ A common method to measure obesity by using the body mass index (BMI), which is calculated using a person's weight (in kilograms) divided by the square of their height (in meters).¹ So BMIs of 30 or greater are considered obese.¹

Obesity prevalence is increasing worldwide. In 2014, 39% of adults aged 18 years and older were considered overweight, and (13%) of those were obese.² However, the prevalence of obesity in Saudi Arabia is 28.7% and is higher among females (33.5%) than in males by (24.1%).³ Abnormal weight is significantly associated with an increase in morbidity and mortality^{3,4} and is related to diabetes, hypertension, hyperlipidemia, obstructive apnea, osteoarthritis, cardiovascular diseases and cerebrovascular accidents.^{3,4} Recent research suggests that obesity is also a risk factor for cancers or Alzheimer's disease.⁴

Obese patients are more costly to treat in hospitals and are often discharged to a continuing-service facility.⁵ Obese patients also require medical procedures such as orthopedic surgery at higher rates.⁵ Beyond the growing health burden in the United States of America (USA), the total costs of obesity in 2030 may exceed 500 billion US Dollars (USD \$).⁶

Several studies have found that obese individuals face major impairments in their Quality of Life (QoL).⁷ The CDC defined Health Related Quality of Life (HRQoL) as "an individual's or group's perceived physical and mental health over time."⁸ HRQoL contains physical and mental health perceptions (e.g., energy level, mood) and their association with functional and psychosocial status.⁸ HRQoL is correlated to both self-reported chronic diseases (diabetes, breast cancer, arthritis, and hypertension) as well as the associated risk factors (body mass index, physical inactivity, and smoking status) for those diseases.⁸

In a cohort study done to assess the role of BMI on quality of life, the authors found that obese patients with clinical knee osteoarthritis (OA) have lower SF-36 scores in physical functioning, role physical, and bodily pain.⁹

In a systematic review, improvements in some parts of the HRQoL and also diabetes mellitus were identified following the gastric sleeve procedure.¹⁰ In a Quality of Life (QoL) assessment that compared Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) to Laparoscopic Sleeve Gastrectomy (LSG), it was revealed that significantly lower values in core symptoms were found in patients after LRYGB than those that received LSG, however, constipation occurred more in those with that underwent LSG.¹¹ Both groups showed significant improvements in sexual and physical activities after the surgeries.¹¹

Gastric sleeve is believed to induce weight loss through significant physiological changes in the gastrointestinal tract and by reducing appetite and increasing satiety.^{12,13} These changes are driven by gastric emptying, raised levels of hormones such as post-prandial cholecystokinin and glucagon-like peptide 1 and reduced levels in others such as ghrelin, which eventually aids patient weight loss and enhances glucose metabolism post-surgery.^{12,13} Moreover, the surgery often resulted in remission of co-morbidities that included type 2 diabetes mellitus, abnormal kidney function, pre-diabetes, hypertension and dyslipidemias (95%, 86%, 76%, 74%, and 66%, respectively) in participants who had had these co-morbidities prior to surgery.^{14,15} There is a scarcity of studies that assess the Quality of Life (QoL) in adult obese patients (> 18years old) who have undergone the gastric sleeve procedure at King Fahd General Hospital in Jeddah in 2017.

MATERIALS AND METHODS

The quasi-experimental study was conducted at King Fahad General Hospital in Jeddah, 2017. Obese adults who were older than 18 years old, had a BMI ≥35, and had at least one or more obesity-related co-morbidities, such as type II diabetes (T2DM), hypertension, sleep apnea, non-alcoholic fatty liver disease, osteoarthritis, lipid abnormalities, gastrointestinal disorders, or heart disease or BMI ≥ 40, were included in the study. Overweight (BMI<35), illiterate and those with a history of bariatric surgeries were excluded. We used Open Epi information to calculate the

appropriate sample size. From previous studies¹⁶, assuming that the acceptable significant difference in the QoL means after sleeve procedure is 66.5+9.1 (mean ± SD) at the power of 99.9%, the calculated sample size necessary was 85 individuals. We included 6 more individuals to each group to compensate for potential missing data.

Consecutive sampling in the laparoscopic surgery clinic was conducted for a period of six months. Researchers assessed the QoL in those who underwent gastric sleeve and reassessed these individuals after three months from the start of intervention. Study tools included anthropometric measurements (height in cm, weight in kg, and calculation of BMI), which were assessed pre- and post-each intervention in each study participant.

SF-36 was used for the assessment of QoL. It constitutes 8 sub-scales and is provided by RAND Corporation (headquarters in Santa Monica, California, United States). As a result of the Medical Outcomes Study (MOS), SF-36 consists of generic, coherent, and easily measured QoL domains. Use of the SF-36 relied on patient self-reporting and these methods are now widely utilized by many organizations in health care for routine monitoring and assessment of patient-centered outcomes. The questionnaire's internal consistency, equivalent-forms, and test-retest reliability were estimated for the eight multi-item scales in the Arabic and English versions in 1998 was approved by RAND Corp. afterward. The short-form questionnaire includes demographics, physical functioning, role limitation due to physical problems, role limitation due to emotional problems, energy/fatigue, emotional well-being, social functioning, bodily pain, and general health assessments.

Descriptive analysis was displayed as a frequency distribution categorized by variable with mean and standard deviations used as quantitative values. Significance was measured using Student's paired t-test (for parametric normally distributed variables). A p-value less than 0.05 was considered significant. Approval letters ensured patients that all data were kept confidential and would not be disclosed except for the study purposes. Data entry and statistical analysis were carried out only by the study investigators to maintain confidentiality. Operations were held at King Fahad Hospital, Jeddah, Ministry of Health. The authors have no conflict of interest with any third party.

Table 1: Characteristics of the Study Group

Characteristics	Sleeve	
	No	%
Gender	Males	19 20.9%
	Females	72 79.1%
Age	<30 years	29 31.9%
	30-<40 years	35 38.5%
	40-<50 years	19 20.9%
	≥50 years	8 8.8%
Educational Level	Primary	7 7.7%
	Intermediate	3 3.3%
	Secondary	28 30.8%
	Bachelor	49 53.8%
	Postgraduate	4 4.4%

Table 2: Mean Difference in Weight Reduction Following Intervention

Intervention	Weight in Kg		Paired difference Mean difference	Paired difference 95% CI of the mean difference		P*
	Mean (SD) pre	Mean (SD) post		Lower	Upper	
	Sleeve	110.9(17.5)		87.7(14.3)	-23.2	

* Based on Paired sample t test

** Statistically significant

Table 3: Mean Score of Participant Response on the Domains of Health Concepts

Domains of Health Concepts	Sleeve group		P*
	Pre	Post	
	mean±SD	mean±SD	
Physical functioning	52.6±22.64	80.7±21.97	<0.001**
Role limitations due to physical health	41.6±38.88	77.0±34.79	<0.001**
Role limitations due to emotional health	47.3±41.66	81.5±29.78	<0.001**
Energy/Fatigue	48.2±18.03	70.3±17.76	<0.001**
Emotional wellbeing	55.9±19.58	72.6±18.99	<0.001**
Social functioning	61.8±26.00	80.7±25.36	<0.001**
Pain	62.6±28.70	79.7±21.98	<0.001**
General health	59.7±18.43	76.7±14.20	<0.001**

* Based on Paired sample t test

** Statistically significant

RESULTS

The response rate was 81.3% (74/91 patients). Table 1 describes participant demographics and Tables 2 and 3 and Figure 1 describe mean difference in weight reduction following intervention and the quality of life assessment by RAND's SF-36 that consists of 8 subscales (domains), as well as global quality of life. Females constituted the majority of the participants (79.1%, Table 1). While a higher proportion of participants were aged <30 years (31.9%), the reverse was observed in the elderly aged, ≥50 years, who made up 8.8% of the participants. 53.8% of patients had a Bachelor degree. Tables 2 shows that there was a significant (p<0.001) reduction in weight after the gastric sleeve, where the weight was reduced from a mean±SD weight of

110.9±17.5kg to a mean±SD weight of 87.7±14.3 kg. The mean±SE change in weight before and after surgery was -23.2±0.96 kg. Ultimately, Table 3 describes the mean scores for the response of the participants on the domains of health concepts and demonstrates that there were significant (p<0.001) increases in all domains among the participants. Figure 1 demonstrates that there was significant (p<.05) increase (58.0±16.7 to 77.7±15.3) in the global score of the QoL. Comparing the magnitude of increment pre/post intervention, it was found that the magnitude of the increment pre and post intervention was significantly (p<0.05) higher in post intervention (mean±SD; 19.7±17.6).

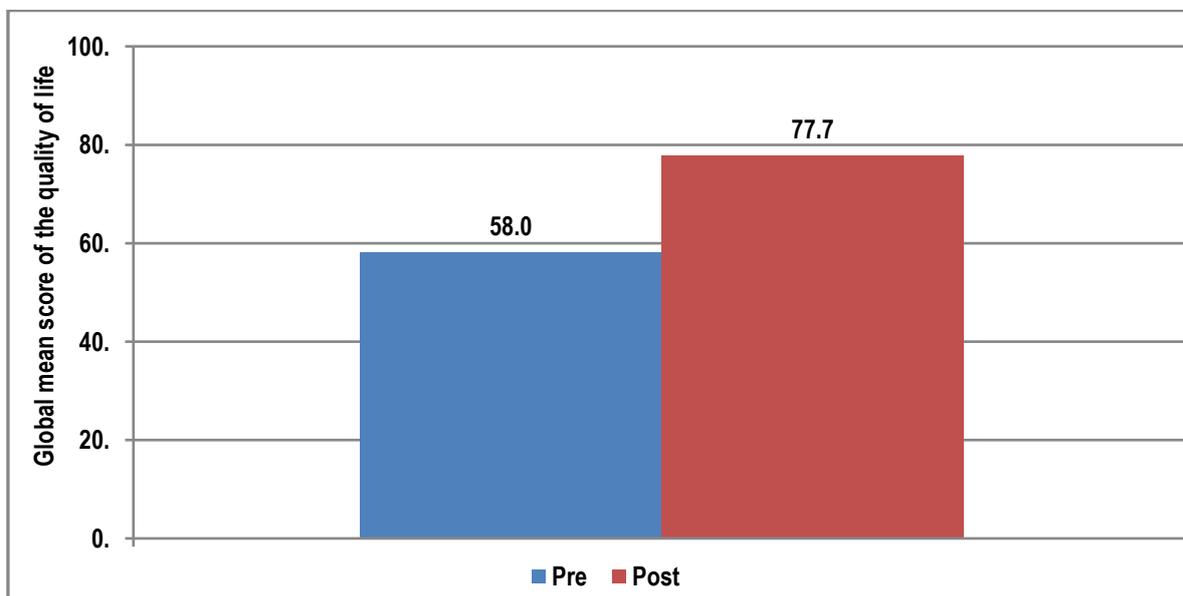


Figure 1: Changes in the global mean score of the quality of life according to the Pre/Post intervention

DISCUSSION

The increase in populations with excessive body mass that has occurred in the last decade has made the obesity and its related diseases a major health concern in the modern world.³ The epidemiological data from Saudi Arabia do not deviate from these global tendencies.³ In our country, the number of people suffering from obesity has substantially increased and this includes the number of patients with a severe form of obesity, namely morbid obesity.³

Bariatric surgery is known to be the most effective available treatment, resulting in significant and long-lasting weight loss.¹⁷ Bariatric surgery leads to improvement in obesity co-morbidities and as well as the so called metabolic syndrome.¹⁸ Besides general health deterioration resulting from obesity, negative physical, psychological, emotional and social aspects related to obesity are also well known.¹⁸ Together these obesity related problems have a negative effect on the patients quality of life.¹⁸

The importance of QoL in the therapeutic process is confirmed by numerous studies that have evaluated the effects of chronic diseases, including obesity, on well-being and life satisfaction in treated patients.¹⁸ However, there is concern regarding complications after bariatric surgeries, which include laparoscopic gastric sleeve, and the effects of these complications, such as Gastro Esophageal Reflux Disease (GERD), on QoL measures following surgery.¹⁹ In addition, there are acute complications like hemorrhages in 1-6 % of patients, gastric leak in 5% of patients and, though rare, intra-abdominal abscess, which occurs in 0.7% of patients.²⁰⁻²³ Also, there are chronic complications like stricture, nutritional deficiencies (vitamin B12, vitamin D, folate, iron, and zinc deficiency reported in 3%, 23%, 3%, 3% ,and 14% of patients, respectively) and Gastroesophageal reflux disease.²⁴⁻²⁶

Here, we wanted to explore the QoL measures after surgery, most commonly done gastric sleeve procedures is resulted in significant improvements in weight reduction and QoL when done in the ministry of health's hospital in the city of Jeddah. The QoL was also significantly enhanced following other types of bariatric surgeries, however, there were no differences in the QoL changes when gastric sleeve and gastric bypass results were directly compared.¹⁸ Our study participants were mostly (79.1 %) females, which likely reflects that females are often more concerned with their body image than males, which results in attempts at weight loss.^{3,27} Infertile females, such as those with polycystic ovarian syndrome, females with low self-esteem and those who want to lose weight (by her own will or by the pressure of the family) in order to increase marriage prospects as observed from study. Moreover, as indicated by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), prioritization of the list of those who are awaiting bariatric surgery include those who are highly affected by their work environment and have an increased level of obesity, obstructive sleep apnea (OSA), type 2 diabetes mellitus and/or other weight related co-morbidities.²⁸

In our characterization of ages, most who underwent the gastric sleeve are younger (<30, <40 31.9%, 38.5, respectively). Before discharge, patients were instructed to follow certain dietary guidelines for a period of 2 months. After, patients are advised to maintain a 1200 kcal per day diet; however, many are unable to do this. BMI measures went from a mean±SD of 43.1±5.50 to 34.1±4.88. A mean ±SE reduction in BMI of -9.0±0.34 and mean±SE weight reduction of -23.2±0.96 Kg).

In a study done by Piotr Major et al, 2016, a sample of 34 patients were treated with LSG and 31 participants qualified for the LRYGB.¹⁸ The average weight of the participants post-surgery was 97.1 kg and the average BMI was 33.4 kg/m² which resulted from a mean weight reduction of 51.55 kg (17.48 kg/m²). The results presented in this study are similar to the significant weight reduction reported here.¹⁸ However, our study showed a smaller mean reduction in weight and BMI that is probably because of a longer follow up duration (1 year) than was completed in our study (3 months). Similar results are reported in other medium to long-term studies.²⁹ The Estimated Weight Loss % (EWL%) was 20.9 % in the our study, although it will likely increase under a longer duration of follow-up.³⁰

The QoL measures in our study showed significant improvements in all 8 domains, which is in accordance with a study conducted by Fezzi, M et al., 2011, where quality of life was assessed after 1 year.³¹ A surprising finding was that this improvement was observed after a 3 month period. Some studies showed improvements in only some of the domains after a 6 month of follow-up with exceptions if there were bodily pain and an emotional role.³⁰ However, in that particular study, a smaller sample size was used.³⁰

In a recent systematic review, reported improvements have occurred as early as 3 months after surgery, although that finding was obtained from a study done on gastric bypass patients, which is also in agreement with what our study's results show.³²

The greatest improvements were relevant to role limitations prior to surgery that were due to physical and emotional health (35.5 and 34.2 respectively), which can be explained by the amount of weight loss.³² The global QoL showed higher measures post-intervention, which increased to mean±SD; 77.7±15.3 from baseline (p<0.05). In another study that value was measured at (66.5, P = .0002).¹⁶

Further research is necessary to assess longer-term outcomes, which include quality of life and the resolution of co-morbidities that including type 2 diabetes mellitus, hypertension, lipid abnormalities, osteoarthritis and obstructive sleep apnea. In our study we had a limitation in the data collection period.

CONCLUSION

The gastric sleeve is associated with improvement in all of QoL domains, but mostly in the role limitations in physical and emotional health. This effect was observed in as early as 3 months post-intervention.

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