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EVALUATION OF INDIVIDUALS WHO HAVE UNDERGONE SLEEVE GASTRECTOMY

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ABSTRACT

Background: Sleeve gastrectomy, is a prominent bariatric surgery known for its ease and low morbidity. The surgical process includes entering the abdomen, mobilizing the greater curvature, and creating a sleeve with a bougie for size guidance. Complications may involve hemorrhage, leaks, strictures, and nutritional deficiencies post-surgery. Monitoring for thiamine deficiency is crucial to prevent serious conditions. **Patients and Methods:** This descriptive, cross-sectional study evaluates postoperative outcomes, knowledge, and quality of life among patients who underwent Laparoscopic Sleeve Gastrectomy (LSG) at Mihrabani Hospital from January to December 2024. Adults aged 18 and older, with a preoperative BMI of ≥40 kg/m² or ≥35 kg/m² with comorbidities, were included. **Results:** The study revealed that Illiteracy affected 24.3%. Urban residents made up 63.3%, with 79.4% married and 70.7% in medium financial status. Surgical outcomes showed 59.7% achieved a health score of 10, and 61.3% had no complications. However, medication adherence was low at 33.0%, with 43.7% taking no medication. Weight loss results indicated that 26.0% lost up to 20 kg, and 40.3% reached their targets. Post-surgery, 67.0% followed recommendations, 91.3% reported decreased appetite, and 57.0% experienced positive effects. Overall satisfaction was high at 85.6%, with 66.4% stating their expectations were exceeded, and support for the surgery was at 83.1%. The most common complication reported was internal bleeding at 2.0%. **Conclusion:** The study shows that surgical intervention resulted in positive outcomes that were very satisfied and exceeded expectations. The procedure's support was strong, with a low complication rate.

KEYWORDS: Sleeve gastrectomy, Satisfaction, Complications.

INTRODUCTION

Sleeve gastrectomy, a widely used bariatric surgery since its initial performance in 1990 as part of a two-stage BPD-DS operation, became popular due to its technical ease and relatively low morbidity. The first laparoscopic procedure occurred in 1999, primarily indicated for patients with super obesity (BMI>60) to facilitate safer future surgeries. Observations of considerable excess weight loss among patients led to the broader application of laparoscopic sleeve gastrectomy (LSG) as the most common weight-loss surgery in the U.S. To perform this procedure, understanding stomach anatomy and blood supply from the celiac trunk and superior mesenteric artery is essential.[1]

The stomach anatomy includes divisions such as the cardia, fundus, body, antrum, and pylorus. Ligaments like the gastrohepatic, gastrophrenic, gastrosplenic, and gastrocolic support the stomach and provide vascular connections. It receives blood from the left gastric artery, common hepatic artery, splenic artery, and their branches, crucial for post-surgical blood supply.[2]

Indications for sleeve gastrectomy primarily intersect with bariatric surgery criteria, requiring candidates to have a BMI≥40 or a BMI≥35 with obesity-related comorbidities, unsuccessful previous non-surgical weight loss attempts, mental health clearance, and no medical contraindications. Recent criteria expansions include those with a BMI of 30-35 facing uncontrollable type 2 diabetes. Absolute contraindications to the procedure include general anesthesia intolerance and severe psychiatric illness, whereas relative contraindications involve Barrett esophagus and severe gastroesophageal reflux disease.[3]

The procedure for laparoscopic sleeve gastrectomy encompasses various techniques, beginning with the entrance into the abdomen via the left upper quadrant. The abdomen is insufflated to 15 mmHg, and trocars are placed strategically: a 5 mm trocar on the left for the assistant, a 5 mm and a 15 mm trocar on the right for the primary surgeon, and a liver retractor in the subxiphoid area. The patient is then positioned in reverse Trendelenburg.[4]

Mobilization of the greater curvature involves dividing the greater omentum near the pylorus, dissecting gastroepiploic vessels, and using bipolar cautery for the short gastric vessels. There's a debated distance (2-6 cm) for the first staple load from the pylorus, with studies suggesting a consensus on starting at least 3 cm from the pylorus.[5]

If a hiatal hernia is present, it should be repaired with interrupted sutures after exposing the left crura of the diaphragm. The posterior mobilization phase requires separation of the omentum, exposing the posterior wall of the stomach. A bougie of size 32-40 French is then placed to guide the creation of the sleeve gastrectomy. Larger bougies are associated with reduced leak rates according to meta-analysis, with a recommendation for 36 French. The stapled sleeve gastrectomy is created using a 60 mm endoscopic stapler, ensuring equal lengths in the anterior and posterior stomach to avoid spiraling, and the resected stomach is removed through the 15 mm port.[6]

Reinforcement of the staple line is crucial for preventing leaks, with a recent meta-analysis indicating that while reinforcement does not significantly reduce leak rates, it decreases overall complications. Experts generally prefer the buttress technique over oversewing. The intraoperative leak test is not consistently reliable, as evidence suggests it often fails to predict postoperative leaks. Closure of the fascial and skin sites follows the procedure.[7]

Complications associated with laparoscopic sleeve gastrectomy include early and late issues. Early complications consist of hemorrhage, which occurs in 1-6% of cases, and leaks with an incidence of 2-3%. Hemorrhages may require reoperation or endoscopic intervention based on bleeding location. Leak management varies between acute and chronic cases, with CT scans as the preferred diagnostic tool. Late complications include strictures (up to 4% incidence), often resolved through endoscopic balloon dilation, and gastroesophageal reflux, which may necessitate conversion to a Roux-en-Y gastric bypass if severe. Nutritional deficiencies are common post-surgery, requiring monitoring and supplementation, with thiamine deficiency needing particularly immediate attention to prevent serious conditions like Wernicke's encephalopathy.[8]

Patients and Methods

Study Design and Setting

Design: A descriptive, cross-sectional study conducted to evaluate postoperative outcomes, knowledge, or quality of life.

Setting: Conducted at Mihrabani Hospital between January 2024 to December 2024.

Ethical Approval: The study protocol was approved by the Institutional Review Board (IRB). Informed consent was obtained from all participants.

Participants and Eligibility

Inclusion Criteria

Adults (≥18 years) who underwent Laparoscopic Sleeve Gastrectomy (LSG) at least 6–12 months prior to the study.

Preoperative BMI ≥40 kg/m² or ≥35 kg/m² with obesity-related comorbidities (e.g., T2DM, hypertension).

Exclusion Criteria

Patients with less than 6 months of follow-up.

Pregnancy during the follow-up period.

History of revisional bariatric surgery.

Data Collection and Assessment

Sociodemographic Data: Age, gender, education level, and employment status.

Clinical Measurements: Current weight, height, and BMI compared to preoperative records.

Outcome Metrics

Weight Loss Success: Calculated using Percentage Excess Weight Loss (%EWL) or Total Weight Loss (%TWL).

Comorbidity Status: Assessment of remission or improvement in hypertension and diabetes.

Nutritional Status: Laboratory evaluation of iron, Vitamin B12, Vitamin D, and protein levels.

Questionnaires: Use of validated tools such as the Moorehead-Ardelt Quality of Life Questionnaire II or the Bariatric Analysis and Reporting Outcome System (BAROS) to assess subjective patient satisfaction.

Statistical Analysis

Data analyzed using SPSS (version 26.0). Descriptive statistics (means, standard deviations, and percentages) used for patient characteristics.

RESULTS

The distribution of the studied sample according to gender was demonstrated in figure (1) which showed that male accounted for 22.9% while females represented 77.1%.

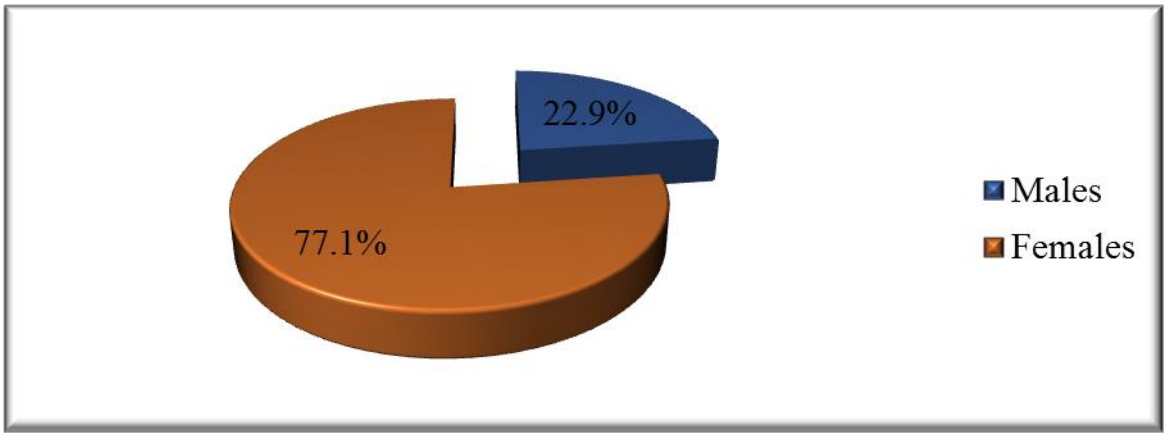

Figure 1: Distribution of the studied sample according to gender.

The distribution of the studied sample according to age groups was demonstrated in figure (2) which showed that the age group 35-44 years was the most frequent group accounted for 34.5% while the age group 55-64 years was the least frequent represented only 7.2%.

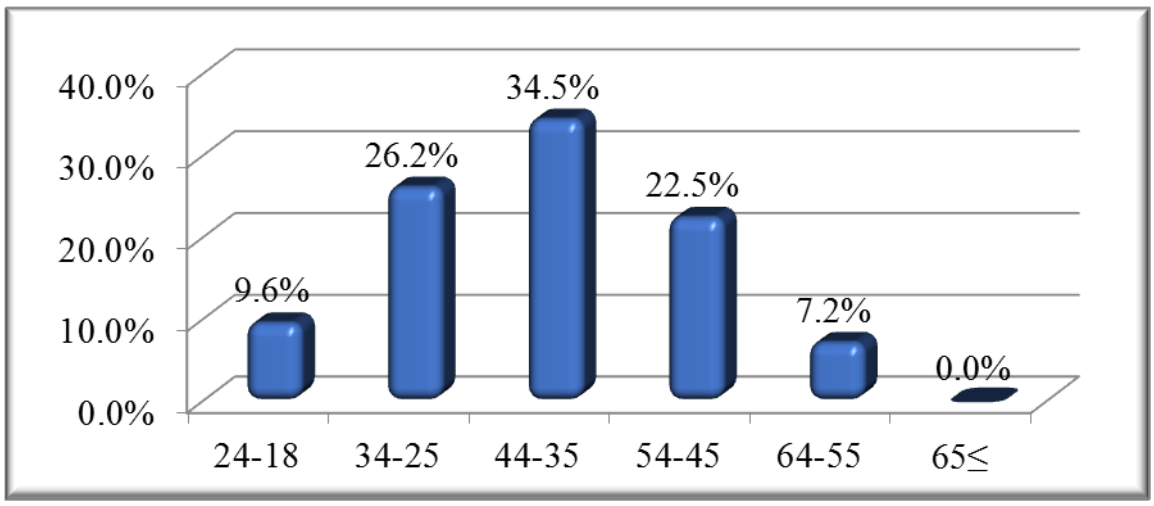

Figure (2): Distribution of the studied sample according to age groups.

The socio-demographic characteristics were demonstrated in table (1) which showed that 24.3% and 24.7% of the studied sample were illiterates and had primary level of education respectively, while only 2.0% had Master's and PhD. Most of the studied sample (63.3%) lived in urban. Married patients accounted for 79.4%, single represented 18.3%, while divorced found in 2.3%. Medium financial status found among 70.7%. Fifty percent of the studied sample were housewives. Family size of 4 and 5 persons represented half of the studied patients.

Table 1: Socio-demographic characteristics.

Socio-demographic characteristics		No.	%
Education Level	Illiterate	72	24.3
	Primary (Elementary)	75	24.7
	Intermediate (Middle School)	46	15.3
	Preparatory (High School)	37	12.3
	Diploma (Associate Degree)	23	7.7
	Bachelor's Degree	41	13.7
	Master's and PhD	6	2.0

Place of Residence	Village / Rural	21	7.0
	District / Sub-district	89	29.7
	City / Urban	190	63.3
Marital Status	Single	55	18.3
	Married	238	79.4
	Divorced/Separated	7	2.3
Financial Status	Low	54	18.0
	Medium	212	70.7
	High	34	11.3
Occupation	Housewife	151	50.3
	Student	22	7.3
	Teacher	16	5.3
	Police / Security	8	2.7
	Private Sector Employee	14	4.8
	Government Employee	32	10.7
	Self-Employed/Earner	26	8.3
	Unemployed	14	4.8
	Others	17	5.8
Family Size	1 person	2	0.7
	2 persons	16	5.3
	3 persons	24	8.0
	4 persons	77	25.7
	5 persons	76	25.3
	6 persons	45	15.0
	7 persons and more	60	20.0

The effects of surgery was demonstrated in table (2) and found that the scale of current general health showed that 59.7% of the studied patients had score of 10 while 3.7% has 5th scale. The complications were not experienced in 61.3% of the sample. The adherence to the prescribed medicines was found 33.0% and 23.3% whether all or some medicine respectively while 43.7% of the studied sample had not taking any medicine. Regarding the weight loss, the highest loss was 20 kg in 26.0%while losing more than 50 kg found among only 4.0%. Reaching the weight loss goal was found in 40.3% and the adherent to the recommendations after surgery was found in 67.0% with decreasing appetite noticed in 91.3%. significant and slight increase in ability to exercise was found in 18.7% and 33.0% respectively, unchanged found in 36.0%. Positive effect of the surgery was found in 57.0%, neutral in 40.0% while the negative effect seen in only 3.0% of the studied sample.

Table 2: Effects of the surgery.

		No.	**%**
Scale of current general health and well-being	5	11	3.7
	6	7	2.3
	7	8	2.7
	8	37	12.3
	9	58	19.3
	10	179	59.7
Experience of any complications or side effects after the surgery	No	184	61.3
	Yes, minor	96	32.0
	Yes, significant	20	6.7
The adherence to medication or food supplements related to the surgery or weight loss	All prescribed medicines	99	33.0
	Some of the medicines	70	23.3
	Not taking any medicine	131	43.7
kilos of weight have you lost	20 kg	78	26.0
	25 kg	46	15.3
	30 kg	59	19.7
	35 kg	57	19.0
	40 kg	30	10.0
	45 kg	18	6.0
	50+ kg	12	4.0
Reaching the weight loss goals as discussed	A lot / Fully	121	40.3

before the surgery	Average / Partially	162	54.0
	Little	17	5.7
The extent to follow recommended diets after surgery	Committed / Adherent	201	67.0
	Neutral	65	21.7
	Not Committed	34	11.3
The change in appetite occurred after the surgery	Decreased appetite	274	91.3
	Unchanged	15	5.0
	Increased appetite	11	3.7
The level of ability to exercise or participate in physical activities after surgery	Significant increase	56	18.7
	Slight increase in ability	99	33.0
	Unchanged	108	36.0
	Slight decrease in ability	30	10.0
	Significant decrease	7	2.3
The effect of the surgery and weight loss on emotional and mental health	Positive effect	171	57.0
	Neutral	120	40.0
	Negative effect	9	3.0

The satisfaction was assessed and illustrated in figure (3) which showed that 85.6% of the studied sample were very satisfied the neutral attitude was noticed in 1.6% and the very dissatisfied found among only 0.4%.

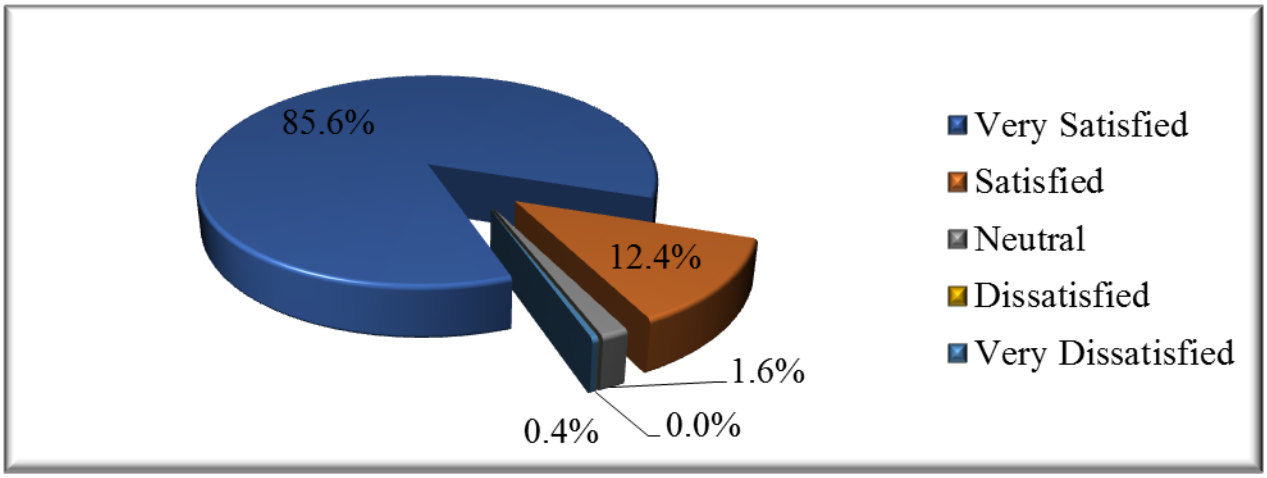

Figure 3: Satisfaction with Team.

In comparing the expectations vs. reality, the figure (4) showed that the results was better than the expected in 66.4% and just as predicted in 32.8%, while the worse than prediction found in only 0.8%.

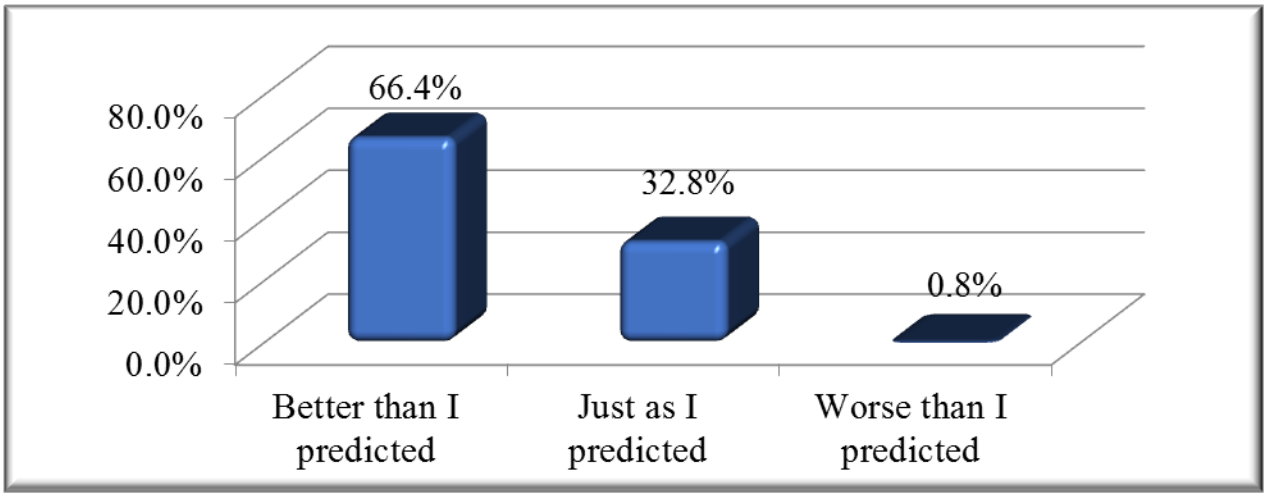

Figure 4: Expectations vs. Reality.

Support/Recommendation with performing the surgery was demonstrated in figure (5) which elicited that 83.1% of the patients strongly support the surgery in compared to only 1.6% who did not support.

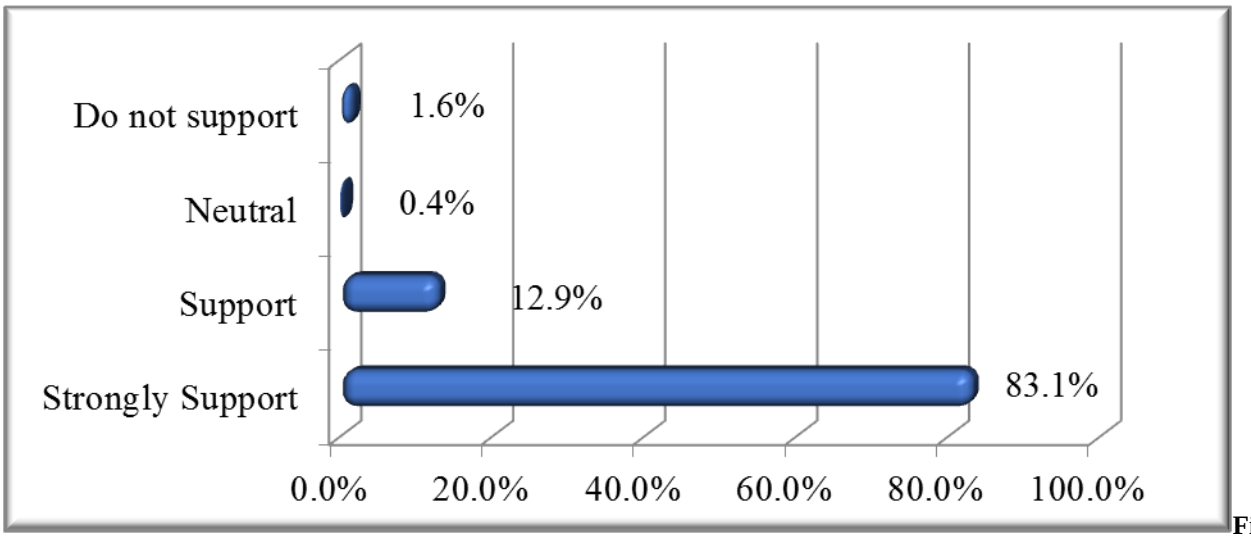

Figure 5: Support/Recommendation with performing the surgery.

Complications after surgery was shown in table (3) which revealed that the most frequent complication was the internal bleeding accounted for 2.0%.

Table 3: Complications after surgery.

Complications	Number	%
Leak	0	0.0
External bleeding	2	0.7
Internal bleeding	6	2.0
DVT (Deep Vein Thrombosis)	1	0.3
Anesthesia (ICU Admission)	3	1.0
Wound infection	0	0.0
The success rate of surgery	100/100	100.0
Deaths	0	0.0

DISCUSSION

Laparoscopic sleeve gastrectomy (LSG) is a common bariatric procedure that involves removing approximately 75–80% of the stomach. While generally safe, it is associated with specific complications categorized by when they occur relative to the surgery date.[3]

The satisfaction of individuals who have undergone sleeve gastrectomy (SG) varies based on several factors, including the surgical approach, postoperative outcomes, and individual experiences. Overall, the current study showed that most of the patients underwent the surgery were very satisfied from the results. Varvoglis et al., 2022[9] study found that 73.6% of patients who underwent sleeve gastrectomy reported satisfaction, which is lower than the 92.86% satisfaction rate for those who had gastric bypass surgery. In a comparison of day-case surgery versus conventional hospitalization for SG, 75% of patients expressed high satisfaction, indicating that the surgical approach can influence patient experiences which reported by Badaoui et al., 2018[10] and Kirat, 2016[11] found a global satisfaction score of 68.9 for patients undergoing sleeve gastrectomy in an outpatient setting, compared to 66.4 for those hospitalized. Non-inferiority was demonstrated for overall satisfaction, though scores were lower than existing literature. Moreover, Mousa et al., 2024[12] found that Sleeve gastrectomy was associated with significant improvements in quality of life, with 70.7% of patients reporting good quality of life post-surgery. Also, Qualitative research conducted by Yates et al., 2020[13] highlighted themes of normality and control, with many patients experiencing enhanced physical and psychosocial well-being. However, in the current study despite the generally positive outcomes, some patients express ambivalence regarding their experiences, suggesting that while satisfaction is high, it may not be universal. This complexity underscores the need for comprehensive preoperative counseling to align patient expectations with potential outcomes.

The expectations versus reality of individuals who have undergone sleeve gastrectomy (SG) reveal a significant

disconnect between anticipated and actual weight loss outcomes. Many candidates enter the procedure with unrealistic expectations, which can lead to disappointment and affect adherence to post-operative guidelines. This overview will explore the weight loss expectations, body image perceptions, and the importance of setting realistic goals for patients undergoing SG. In the current study, Candidates often report high expectations for weight loss, with average "dream" weights significantly lower than clinically expected outcomes. In studies conducted by Price et al., 2013[14] and Price, 2013[15], the patients anticipated a 88.7% excess weight loss (EWL) for their "dream" weight, while the clinically expected EWL is around 56.1% after one year. The discrepancy in expectations can lead to dissatisfaction post-surgery, as many patients may feel disappointed if they do not achieve their ideal weight as reported by Janik et al., 2019.[16] Body image dissatisfaction in Price, 2013[15] was prevalent among candidates, with many expressing unrealistic expectations regarding their post-operative body shape. The average dissatisfaction score was noted to be 4.1 out of 7, indicating a significant gap between desired and actual body image. Also, Opozda et al., 2018[17] found that the dissatisfaction can impact mental health and overall satisfaction with the surgical outcome, emphasizing the need for psychological support.

Establishing realistic weight loss goals is crucial for patient satisfaction and adherence to post-operative care and the study conducted by Janik et al., 2019[16] found that the predictive models have been developed to help set these expectations based on individual factors such as preoperative BMI and age. Education and counseling before surgery can help align patient expectations with clinical realities, potentially improving long-term outcomes as reported by Wilson & Aminian, 2021.[18] Conversely, while many patients may initially have unrealistic expectations, some may find that the surgery leads to unexpected positive changes in their eating behaviors and overall health, highlighting the complexity of individual experiences post-surgery, this was found in Opozda et al., 2018 study[17], moreover, individuals undergoing laparoscopic sleeve gastrectomy (LSG) often have unrealistic weight loss expectations, with reported "dream" weights significantly lower than clinically expected outcomes. Only the "disappointed" weight aligns with the average expected % excess weight loss of 56.1% after one year.

Individuals who have undergone sleeve gastrectomy (SG) often recommend the procedure to other patients due to its significant benefits in weight loss and resolution of obesity-related comorbidities. The evidence suggests that SG is effective for patients with obesity, particularly those with metabolic conditions, while also highlighting the importance of careful patient selection and postoperative support. Altun et al., 2016[19] concluded that Sleeve gastrectomy has been shown to induce substantial weight loss, with studies reporting an average excess weight loss of 89.7% after two years and the comorbidities such as diabetes, hypertension, and obstructive sleep apnea have shown resolution rates of 80.6%, 82.9%, and 94.3%, respectively. Albanopoulos et al., 2016[20] found that a three-year follow-up indicated a mean BMI reduction to 29.8 kg/m², with significant decreases in obesity-related conditions. While SG is generally safe, Ilias, 2012[21] found that the complications such as leaks (1.06%) and gastroesophageal reflux (12%) have been reported. Also, Stenberg et al., 2022[22] found that the patients with psychiatric comorbidities may face higher risks, necessitating thorough preoperative evaluations. In Yar et al., 2025[23], postoperative patients are at risk for nutritional deficiencies, particularly in vitamin B12, iron, and vitamin D, which require ongoing monitoring and supplementation.

Sleeve gastrectomy (SG) is a prevalent bariatric procedure, yet it is associated with various complications that can impact patient outcomes. The complications can be categorized into early and late occurrences, with a range of management strategies available. Stoyanov et al., 2023[24] reported stapler-line leakage is a significant early complication, reported in 2.15% of cases, and abdominal bleeding due to suture line issues occurred in 2.15% of patients. Abril & Alberto, 2015[25] reported that the surgical site infections were noted at a low rate of 0.3%. De novo GERD was observed as late complication in 7.53% of patients and gastric strictures necessitating endoscopic dilation were reported in 1.08% of cases by Stoyanov et al., 2023[24], with some requiring revision surgery . A notable complication is weight regain, affecting 4.5% of patients as reported by Abril & Alberto, 2015.[25]

Despite these complications, Matharoo & Lepis, 2020[26] showed that the overall morbidity and mortality rates remain low, emphasizing the importance of careful patient selection and management strategies. However, Lee et al., 2024[27] reported that the some argue that the focus on surgical success may overshadow the need for comprehensive post-operative care to address these complications effectively.

CONCLUSION

The study shows that surgical intervention resulted in positive outcomes, with 85.6% of patients very satisfied and 66.4% feeling the results exceeded expectations. The sample was mainly female (77.1%), with 79.4% married and 63.3% living in urban areas. Post-surgery, 59.7% reported high health scores and 61.3% experienced no complications; adherence to post-operative recommendations was 67.0%, and 40.3% achieved weight loss goals. The procedure's support was strong (83.1%), with a low complication rate, including a 2.0% incidence of internal bleeding, highlighting overall favorable outcomes.

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