



## STUDY OF THE QUALITY OF OBESE PATIENT'S CONDITION BEFORE AND AFTER GASTRIC SURGERY

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### ABSTRACT.

**Introduction:** Obesity is a multifactorial disease that is increasing in developing countries. People with obesity suffer from quality of life (QoL)-related health problems. The purpose of this study was to investigate the effect of gastric bypass surgery on three aspects of QoL, anxiety, and depression among patients with obesity. **Method:** This is a cross-sectional study on all patients with obesity referred to Sina Hospital during the three months of Summer 2016. Data collection was done by means of the Beck Depression Inventory, Beck Anxiety Inventory, and SF-36 Questionnaire. Data were analyzed using paired t-test and Pearson correlation coefficient using IBM SPSS 20.0 software. The significance level was considered as 5%. **Results:** The mean score of the QoL questionnaire and its dimensions in patients with obesity before and three months after surgery was significantly different ( $p < 0.001$ ). Depression and anxiety of the patients also significantly decreased compared to the pre-operation ( $p < 0.001$ ). There was a significant correlation between decreased anxiety and depression and improvement in the physical and mental health of patients after the operation ( $p < 0.001$ ). **Conclusion:** Gastric bypass surgery leads to improved QoL, decreased anxiety, and depression in patients with obesity. Correlation between anxiety and depression with components of QoL also showed improvement in patients' life after gastric bypass surgery.

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### Introduction

Among the various diseases that affect humans, obesity is considered the most common one in human society [1]. Morbid obesity is a condition in which the body weight is 20% over the ideal weight or Body Mass Index (BMI) is higher than 40 [2, 3]. Morbid obesity imposes severe restrictions on the QoL and, at the same time, leads to several diseases and metabolic complications, such as high blood pressure (hypertension), high cholesterol and triglyceride, insulin resistance, and cardiovascular and pulmonary diseases [3, 4]. Studies have shown that factors such as disturbed eating behaviors, stress, anxiety, depression, and lack of physical activity play an important role in developing obesity [5].

Under certain conditions, obesity leads to depression symptoms in individuals, and sometimes depression itself is associated with overweight and obesity [6]. As a moral trait, excitement and anxiety lay the groundwork for obese people to tend toward emotional eating. Obesity has also been suggested as an independent factor influencing the QoL. Obesity has far-reaching effects on QoL. Various studies have shown an association between increased BMI and impaired QoL. They emphasize that obesity can disrupt various aspects of life, including physical functioning, sexual functioning, self-confidence, and work [7, 8].

Nowadays, several approaches have been developed for weight loss and obesity treatment, including physical activity, diet, lifestyle changes, psychological interventions, and medication interventions. Since non-surgical procedures have failed in weight loss, the number of bariatric surgeries, especially gastric bypass surgery, increases day by day. According to research, gastric bypass surgery has been very effective in reducing the patient's weight and has fewer complications than other bariatric surgeries [9]. This method limits both the amount of food consumed and the amount of time it takes to absorb the food. Within 14-19 months after gastric bypass surgery, 60-70% of patients lose their excess weight.

In many cases, it lasts up to 10 years. This method can be used for people aged 18-65. This surgery carries a higher risk for people over 65 [10]. It is also considered the last and most definitive treatment for patients with a BMI above 40, i.e., class 3 obesity or extreme obesity [10].

Studies have demonstrated that surgery is usually associated with improved mental functioning and QoL for most people [11]. Bariatric surgery also has a significant effect on mental health. It substantially reduces psychological distress, which, in

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turn, affects the QoL. These studies suggest reducing a person's weight due to an overall improvement in psychological pathology, depression symptoms, eating behaviors, and postoperative body image [12].

Meanwhile, studies on the effects of surgery on the mental health of obese people have been ignored. Therefore, this study examined the QoL, depression, and anxiety of patients with morbid obesity three months before and after gastric bypass surgery.

#### **Methods studied:**

This was a cross-sectional study performed on all obese patients undergoing gastric bypass surgery referred to Sina Hospital in Mashhad during the summer quarter of 2016. According to the objectives of the study, the required data were collected using questionnaires, and attitudes and conditions of patients with morbid obesity were assessed before and after surgery.

The questionnaires used were the SF-36 Questionnaire, Beck Depression Inventory, and the Beck Anxiety Inventory. The SF-36 Questionnaire consists of eight scales, each consisting of 2 to 10 items. This questionnaire has eight subscales: physical functioning (PF), role physical (RP), role emotional (RE), energy/fatigue (EF), emotional well-being (EW), social functioning (SF), pain (P), and general health (GH). Also, the integration of subscales yielded two general subscales: physical health and mental health.

**Beck Depression Inventory-II (BDI-II):** It is a new version of a 21-item self-report questionnaire revised in 1996. It was first used to measure the severity of depression in adults and adolescents 13 years of age and older. In this questionnaire, people are asked to answer questions by considering their feelings in the last two weeks.

**Short-Form Beck Anxiety Inventory:** It is a self-report questionnaire designed to measure the severity of anxiety in adolescents and adults. The questionnaire consists of a 21-item scale, in which the subject chooses one of four options in each item, indicating the severity of anxiety. The four options of each question are scored from 0 to 3 in a four-part spectrum. Each test item describes one of the most common symptoms of anxiety (including mental, physical, and panic symptoms). Accordingly, the total score of this questionnaire is in the range of 0 to 63 [13].

#### **Data analysis method**

The collected data were analyzed using IBM SPSS 20.0 software. Data were described using central and dispersion indices such as mean and standard deviation and analyzed using paired t-test and Pearson correlation coefficient.

This is a research project approved by Mashhad University of Medical Sciences (MUMS), in which all ethical principles have been observed.

#### **Findings:**

This study was performed on 40 patients aged 30-60 years with morbid obesity with education level from diploma to bachelor's degree.

Before gastric bypass surgery, the patients' QoL score was  $198.2 \pm 91.7$  in the physical dimension and  $192.2 \pm 69.6$  in the psychological dimension. Three months after surgery, QoL scores in the physical and mental dimensions experienced an increase of  $117.5 \pm 80.5\%$  and  $60.6\% \pm 49.5\%$ , a statistically significant increase ( $p < 0.0001$ ). The largest change in physical health was a 605% increase in score than the preoperative phase, and the smallest change was a 35% decrease. The QoL in terms of physical health of half of the patients showed an improvement of more than 31%. Moreover, the largest and smallest changes in patients' mental health were an increase of 230% and a decrease of 52%, respectively.

Beck's anxiety score in patients experienced a decrease of  $13.6 \pm 7$  points three months postoperatively than the preoperative phase, a statistically significant difference with a 95% confidence level ( $p = 0.002$ ). The range of changes in preoperative and postoperative anxiety scores was 6-130 and 3-79, respectively. Furthermore, gastric bypass surgery caused a decrease of  $28.16 \pm 18.83\%$  in the Beck depression score of morbidly obese patients (Table 1).

Table 2 shows the scores of the subscales of the QoL test in the pre- and postoperative phases. Among the dimensions of the "physical health" component, the largest and smallest changes were related to the dimensions of physical disorder and general health, respectively. Likewise, among the dimensions of the "mental health" component, the highest and lowest increases were related to emotional disorder and energy dimensions, respectively. Unlike other dimensions, in the dimension of "emotional well-being," a significant increase was observed in scores compared to the preoperative phase ( $p < 0.0001$ ).

A significant correlation was observed between reduced anxiety and improved physical health ( $p = 0.013$ ,  $r = 0.39$ ) and improved mental health ( $p = 0.005$ ,  $r = 0.44$ ) compared to the previous state. There was also a significant correlation between decreased depression and increased scores of patients' physical health ( $p = 0.008$ ,  $r = -0.41$ ) and mental health ( $p < 0.0001$ ,  $r = -0.57$ ).

**Table 1.** Comparison of the frequency distribution of QoL, anxiety, and depression, before and after gastric bypass surgery

Questionnaire/criteria		Time	Mean±SD	Probability
QoL	Physical Health	Before surgery	198.2±91.7	p<0.0001**
		Three months after surgery	284.5±78.8	
	Mental Health	Before surgery	192.2±9.6	p<0.0001**
		Three months after surgery	260.3±72.4	
Depression		Before surgery	38.3±17.1	p<0.0001**
		Three months after surgery	31±15.5	
Anxiety		Before surgery	36.7±22	p=0.002**
		Three months after surgery	29.7±17.5	

<sup>1</sup>Paired t-test was used for comparison.

\*\*A significance level of 1%.

**Table 2.** Comparison of the frequency distribution of dimensions of QoL questionnaire, before and after gastric bypass surgery

Questionnaire/criteria		Time	Mean±SD	Probability	
Physical Health	Physical Functioning )PF(	Before surgery	44.1±30.2	p<0.0001**	
		Three months after surgery	72.7±28.5		
	Role Physical )RP(	Before surgery	45.6±36.6	p<0.0001**	
		Three months after surgery	78.1±30.6		
	Pain )P(	Before surgery	57.5±33.2	p=0.013**	
		Three months after surgery	73.5±28.6		
General Health )GH(		Before surgery	50.9±13.2	p<0.0001**	
		Three months after surgery	60.10±13.0		
Mental Health	Role Emotional )RE(	Before surgery	41.7±40.5	p<0.0001**	
		Three months after surgery	79.1±32.6		
	Energy/Fatigue )EF(	Before surgery	50.6±21.7	p=0.001**	
		Three months after surgery	65.6±24.8		
	Emotional Well-being )EW(	Before surgery	53.5±11.7	p<0.0001**	
		Three months after surgery	44.6±8.8		
	Social Functioning )SF(		Before surgery	46.4±28.9	p<0.0001**
			Three months after surgery	70.9±26.6	

<sup>1</sup>Paired t-test was used for comparison.

\*\*A significance level of 1%.

\*A significance level of 5%.

## Discussion and Conclusion

Obesity can be considered a chronic disease with negative physical and psychological consequences, which has adverse effects on patients' activity and QoL (4). In addition to significant and lasting weight loss for the patient, bariatric surgery brings other important benefits. Recent studies have shown that surgical treatment of obesity reduces long-term weight loss, eliminates or improves morbid obesity, and improves the QoL. It also helps in the overall treatment of diabetes, improves the progression of cardiovascular diseases, and reduces the risk of mortality by up to 35% over time. Studies have also demonstrated that a person loses weight due to an overall improvement in psychological pathology, depression symptoms, eating behaviors, and postoperative body image [12].

This study indicated a significant difference between QoL, depression, and anxiety in obese patients before surgery and three months after surgery.

In their study, Vallis et al. (2007) found that surgery is often associated with improved mental functioning and QoL in most people. Moreover, mental functioning improved, and the person's depression score decreased over time [14]. In their study, Averbukh et al. (2003) also found a positive association between QoL and preoperative depression and success in losing weight one year after surgery. The results also showed that more depressed people were more likely to lose more weight than people with lower levels of depression [15].

Dixon et al. (2003) conducted a study on 478 patients before surgery and one year after surgery using the Beck Depression Inventory. The results showed that weight loss was associated with a significant and persistent drop in the Beck Depression Scale scores four years after surgery [16].

In their study, Maureen, et al. (2002) assessed the QoL after gastric bypass surgery and reported significant differences in the QoL of individuals. Significant differences were observed in depression and self-esteem with weight loss in patients with morbid obesity six months after surgery. This means that the level of depression decreased and self-esteem increased due to weight loss. Moreover, the individual's level of physical functioning increased rapidly after surgery, and they became more optimistic about their general health [17]. Another study of about 7,000 people by Karlsson et al. (2002) examined a ten-year trend in health-related QoL (HRQoL) after surgical treatment of severe obesity. In this study, weight-related psychological

problems were observed more in women than obese men. Mental disorders were also closely linked to their bad moods. Symptoms of depression and anxiety decreased dramatically over time with weight loss [18]. In this study, as in previous studies, the greatest difference was observed in the dimensions of QoL in obese patients before surgery and three months after surgery in relation to the subscales of physical health, physical functioning (PF), role physical (RP), general health (GH), and pain (P). Furthermore, the largest differences were observed compared to the preoperative phase in the subscales of mental health, role emotional (RE), social functioning (SF), emotional well-being (EW), and energy/fatigue (EF), respectively.

This study has a number of limitations, including self-report tools. The participant may have given negligent or untrue answers. In general, the reported differences in the results of QoL studies may be related to differences in the tools and questionnaires employed or problems responding to the questionnaires.

Additionally, due to the long questions and time-consuming response process, it is suggested to utilize simpler questionnaires, such as the EQ-5D questionnaire, to assess the QoL of the target community, especially communities that need high speed and less time to spend.

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