Changes in Quality of Life Scores after Bariatric Surgery: 
A Prospective Clinical Cohort Study

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Abstract

Background: Obesity poses serious health consequences, and bariatric surgery remains the most effective and durable treatment. The goal of this study was to identify early changes in weight parameters and Health Related Quality of Life (HRQoL). A trial was then made to correlate these changes with the degree of weight loss after surgery.

Methods: A prospective cohort study was done including 30 obese (BMI \( \geq 40 \) or \( \geq 35 \) with comorbidites) to whom laparoscopic sleeve gastrectomy was done. Results were statistically analysed before and after surgery. A correlation study was made between lost weight and changes in quality of life scores.

Results: A statistically significant reduction of body weight parameters occurred at 2 weeks and 3 months intervals postoperatively. Quality of life scores showed marvellous improvement 2 weeks and particularly 3 months after surgery. No significant correlation was found between percent changes in excess body weight and changes in quality of life score.

Conclusions: Bariatric surgery was followed by early significant changes in body weight parameters. An early improvement in quality of life scores after surgery is quite evident.

Key Words: Obesity – Bariatric surgery – Weight parameters – Quality of life score.

Introduction

OBESITY is a serious chronic disease that is associated with a reduced life span, increased disability, and an increased risk for many serious illnesses such as cardiovascular disease, type 2 diabetes mellitus, and certain cancers [1]. Thus, it is not surprising that various studies have found an association between obesity and poor cognitive performance [2] as well as reduced quality of life [3]. Health-Related Quality of Life (HRQoL) is assessed by measuring bodily pain, general health perception, and vitality [4] studies have reported a pronounced reduction in HRQoL especially among younger subjects and females. A lower HRQoL has also been found among obese persons seeking intensive treatment for their disease [5].

An important association exists between obesity and mental illness that impacts all aspects of an individual's quality of life. We do not yet completely understand all the mechanisms linking obesity and mental illness [6].

The World Health Organization defines quality of life as “the individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal believes, social relationships and their relationship to salient features of their environment” [7].

A high prevalence of psychological comorbidities exists in obese patients, particularly mood disorders, anxiety, and low self-esteem. Extremely obese individuals are almost 5 times more likely than their average weight counterparts to have suffered from a major depressive episode [8].

The relationship between obesity and depression is complex; a meta-analysis of longitudinal studies suggested a bidirectional link between depression and obesity. Clinically depression tends to improve following weight loss in patients receiving lifestyle modification [9,10].

Several studies have shown that these individuals have lower household incomes, struggle to find higher education, and are less likely to be married as compared to their non obese peers of

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similar intellectual aptitude. Furthermore, repeated failed attempts to lose weight are common in this population and are likely to aggravate depressive illness, hopelessness, and poor self-esteem perhaps contributing to further weight gain [8].

There has been an ongoing interest in the HR-QoL of obese persons. The relationship between Body Mass Index (BMI) and generic HRQoL has been examined in several studies [11-13]. Consistent finding in these studies is that higher BMI is associated with lower HRQoL scores, particularly for the physical aspects of quality of life [14]. Certain psychological problems, including binge-eating disorder and depression, are more common in obese persons as well [8].

Regular physical activity and exercise, especially when used in combination with dietary therapy, has been shown to improve various HRQoL indicators, such as physical and social functioning, mood and self-esteem in obese individuals [15].

It is reported, that the effect of bariatric surgery is not only determined by the reduction in weight, comorbidity and mortality but is also determined by measuring of the quality of life. Several investigators showed improvement of quality of life scores after bariatric surgery. Especially in relation to joint pains [3,6,14,16].

**Aim of the study:**

The aim of this study is to find out the effects, if any, of bariatric surgery on the quality of life. A trial was made to correlate between changes in weight loss parameters and quality of life scores.

**Patients and Methods**

In this work patients undergoing bariatric surgery, namely sleeve gastrectomy, were followed-up to evaluate changes in quality of life scores and correlate these changes with body weight parameters.

The present study was conducted in General Surgery Department, Kasr El-Aini Hospital during the period from January 2014 to the End of June 2015. Indications for surgery were in accordance with the criteria of 'The National Institute of Health consensus development conference statement for surgical treatment of obesity' [17]. These criteria are:

- Patients who have BMIs of 40kg/m$^2$ or more, or between 35kg/m$^2$ and 40kg/m$^2$ with other significant disease that could be improved if they lost weight.
- All appropriate nonsurgical measures have been tried but have failed to achieve or maintain adequate, clinically beneficial weight loss for at least six months.
- Patients receiving or will receive management in a specialist obesity service.
- Patients who are generally fit for anaesthesia and surgery.
- Patients committed to the need for long-term follow-up.

This study comprised 34 obese patients, with Body Mass Index (BMI) of 40kg/m$^2$ or more, or between 35 and 40kg/m$^2$ with diabetes, hypertension and/or dyslipidemia. Number of patients was limited as this operation is done at a limited scale in Kasr El-Aini Hospitals.

Patients were subjected to clinical and laboratory evaluation at preoperative stage, 2 weeks and 3 months postoperative period. Out of 34 patients, only 30 completed the follow-up visits.

Patients dictated to surgery were exposed to thorough medical history taking, physical examination and laboratory investigations. Quality of life was assessed using Moorehead-Ardelt questionnaire [18] which includes:

1- Self-esteem.
2- Sexual activity.
3- Social activity.
4- Labour conditions.
5- Physical activity.
6- Eating behaviour.

A collective score was calculated:

-3 to –2.1 = Very poor.
–2 to –1.1 = Poor.
–1 to 1 = Fair.
1.1 to 2 = Good.
2.1 to 3 = Very Good.

**Ethical considerations:**

All patients who participated in the study were informed about the details and objectives of the study. A written consent was taken from every patient.

**Statistical methods:**

Data was analyzed using IBM SPSS Advanced statistics version 20.0 (SPSS Inc., Chicago, IL). Numerical data were examined as mean and standard deviation or median and range as appropriate. Qualitative data were expressed as frequency and
percentage. McNemar test and sign test were used to examine the before-after data of qualitative variables. For quantitative data, comparison of repeated measures was done using paired-sample t-test. Pearson product-moment or spearman-rho method were used to estimate correlation between numerical variables as appropriate. All tests were-tailed. A p-value <0.05 was considered significant.

Results

Table (1) shows the demographic and baseline clinical characteristics of the studied group. The baseline Body Mass Index (BMI) of the studied group ranged from 35.1kg/m² to 70.3kg/m² with a mean of 47.9±7.7kg/m². The mean excess weight in the studied group was 61.4±18.3kg. Fig. (2) shows the baseline, ideal and excess weights of the studied group.

Table (1): Demographic and clinical characteristics of the studied group.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean ± SD/ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>34.6±10.4</td>
</tr>
<tr>
<td>Sex:</td>
<td></td>
</tr>
<tr>
<td>Male :Female</td>
<td>4:26</td>
</tr>
<tr>
<td>Male to female ratio</td>
<td>2:134</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>130.2±20.3</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>164.9±5.6</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>47.9±7.7</td>
</tr>
<tr>
<td>Ideal weight (kg)</td>
<td>67.8±4.4</td>
</tr>
<tr>
<td>Excess weight (kg)</td>
<td>61.4±18.3</td>
</tr>
</tbody>
</table>

Fig. (1): The mean baseline, ideal and excess weights of the studied group.

Fig. (2) illustrates the distribution of the quality of life grade in the studied group at base line. The median Quality of Life (QoL) was –0.9 ranging from –3 to 0.8.

Table (2) & Fig. (3) illustrate changes in weight parameters 2 weeks and 3 months after surgery. A statistically significant weight loss (p<0.01) and (p<0.001) was established 2 weeks and 3 months after surgery.

Table (2): Weight and weight changes (Mean ±SD) of the studied group two weeks and three months after surgery.

<table>
<thead>
<tr>
<th>After 2 weeks</th>
<th>After 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>118.9±19.5</td>
</tr>
<tr>
<td>Weight loss (kg)</td>
<td>11.1±3.6</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>43.8±7.5</td>
</tr>
<tr>
<td>% EBWL</td>
<td>19.1±6.9</td>
</tr>
<tr>
<td>% TWL</td>
<td>8.6±2.7</td>
</tr>
</tbody>
</table>

% EBWL : Excess Body Weight Loss (%). % TWL : Total Weight Loss.

Fig. (3): Mean body weight of the studied group at baseline, 2 weeks and 3 months after surgery.

Figs. (4,5) represent distribution of the quality of life grade 2 weeks and 3 months after surgery.

Table (3) as well as Fig. (6) show changes in the quality of life score and grade 2 weeks and 3 months after surgery. A highly significant improvement of the quality of life was observed (p<0.001).
A trial was made to correlate between percent excess weight loss (%EBWL) and % change in quality of life score 2 weeks and 3 months after surgery. No correlation, however was found ($p=0.986$ and $0.979$ respectively).

![Graph showing correlation between % EBWL and % change in QoL score](image)

**Fig. (7):** Correlation between percent change of quality of life score and %EB WL two weeks after surgery.

![Graph showing correlation between % EBWL and % change in QoL score](image)

**Fig. (8):** Correlation between percent change of quality of life score and %EB WL three months after surgery.

### Discussion

It has been suggested that excess body weight loss percentage (%EBWL) is the standard parameter for assessment of body weight response to surgery [6]. In this study, the mean excess body weight loss percentage was 19.8% ranging from 9% to 32%. Total weight loss percentage was 8.3% (3-14.2%). Mean body weight of the study group dropped from $130\pm20k.g$ to $118.9\pm19k.g$. These values were recorded just two weeks after surgery. Relative to the weight two weeks after surgery, there was a further significant weight loss three months later ($p<0.001$). The median excess body weight loss percentage (%TWL) was 18.3% ranging from 9.8% to 25.7%.

It is well documented that weight loss after surgery was significantly greater than for non
surgical treatment, approximately 20 to 20k.g or 20 to 30% more than in non surgical protocols \[19\]. Time is well-known to be influential factor in postoperative weight loss.

As mentioned before, according to Moorhead Ardfelt quality of life score \[18\], 43% of our patients had poor quality of life scores before surgery. Impairment in health-related quality of life and dysphoric mood were reported by many investigators \[8,20\] in obese patients.

A dramatic improvement in HR-QoL scores was noted as early as two weeks after surgery. The median score changed from -0.9 (range -3 to 0.8) preoperatively to 0.5 (range -1.8 to 2). A further progress occurred three months later. The median score reached up to 2.1 (0.3-3). These changes were not correlated with either EBWL% or absolute body weight loss (r=0.003, p=0.98).

Repeated failed attempts to lose weight are common in the morbidly obese patients. This is likely to aggravate depressive illness, hopelessness and poor self-esteem, perhaps contributing to further weight gain \[8,21\].

The dramatic improvement in HRQoL noticed in this study as early as few weeks after surgery, and the absence of correlation with early changes in body weight suggest that these changes are certainly related to patients’ success in taking the decision of surgery. This feeling of success was certainly aggravated by the sizable weight loss noticed by the patient. After 3 months, with regression of early postoperative eating troubles, improvement in mood progressed into a real ‘hope’ of reaching ‘normal’ physical and mental state.

Contrary to the results of most studies, a recent publication \[22\] reported that a subgroup of individuals suffered an increase in depressive scores post surgery (14 out of 107 patients, 13.1%). The authors gave no definite explanation for this phenomenon. They stated that these patients may have experienced less weight loss and may have more psychological comorbidities. This view was supported previously \[9\]. The definite mechanism for aggravation of depression postoperatively, however is not definite. This is important especially considering the reported increased risk of suicidal attempts following bariatric surgery \[22\]. A small prospective study reported that three participants out of 86 (3.5%) developed a clinical depressive disorder following surgery \[23\].

Inspite of these few reports, the overall depressive levels tend to decrease substantially following surgery \[24\] during short term and long term follow-up. Greater decreases in depression scores have been associated with greater % excess weight loss \[25\]. A correlation between HQoL score and % weight loss, however was not evident in our study, mostly due to the very short time of follow-up.

**Conclusion:**

It was concluded that bariatric surgery can induce a significant reduction in all weight parameters on a short term level. The most outstanding results are the improved health quality scores far beyond the loss in weight parameters.

Bariatric surgery has thus added, from the family medicine point of view to our prophylactic and curative tools against the threat of both physical and mental illness in obese population.

**References**


