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Research Article

Impact of Bariatric Surgery on Patient's Psychological State

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Abstract

Background: Obesity is an increase in weight where body mass index exceed 30 kg/m2. It became a global epidemic disease, causing a serious medical problems including atherosclerosis. There are many options to decrease weight, include physical activity and administration of pharmacological treatment. However, bariatric surgery is the most effective option especially for those having morbid obesity. Psychological problems and disorders are more common for candidates of bariatric surgery. These Psychological problems can be improved by bariatric surgery.

Objectives: The objective of the current study is to demonstrate the psychiatric effect on bariatric surgery patients.

Design: The research is a cross sectional study.

Settings and Patients: This study was performed on 350 bariatric surgery persons from Military hospital of Prince Sultan Military Medical City and Dr. Sulaiman Al Habib Hospital (obesity treatment centers) in the period from 26th December 2016 to 12th January 2017.

Main Outcome Measure: Improvement of Patient's Psychological State.

Methods: This study was performed on 350 persons after undergoing bariatric surgery. 5 scale point questionnaire was used to identify Psychological problems.

Results: High psychological scores for participants were found and this reflects Psychological improvements after bariatric surgery.

Conclusion: Bariatric surgeries effective on psychiatric problems and disorders.

Limitations: The study is limited to persons after undergoing bariatric surgery.

Keywords: *Bariatric Surgery; Psychiatric Disorders; Obesity; BMI*

Introduction

Obesity is defined as a disease in which body mass index (BMI) is larger than 30 kg/m^2 [1]. It is a chronic and serious problem related to public health [2]. Actually, it became a socioeconomic and a medical problem not only in developed countries [3], but also globally [4]. This quickly spreading disease in this century [5] has been increased in all society categories including adults, adolescent and even children [1]. In 2008 The world health organization (WHO) reported that 500 million person were obese and their BMI ≥ 30 kg/m^2 [6], also WHO described obesity as a global epidemic disease [7]. The prevalence of obesity varies in different areas in the world [4], in United States obesity increased by 70% in the period 2000 to 2010 with BMI > 40 kg/m^2 [8]. Saudi Arabia is one of countries has highest prevalence of obesity rates [7,9]. Saudi Arabia has an increasing trend for obesity [4,10], almost third adults are obese and 70% are

overweight, this shows the fastest growing rates of obesity in the kingdom [11]. Obesity is a leading cause of medical problems [12], and diseases including diabetes, hypertension, stroke, atherosclerosis, cardiovascular disease, hyperlipidemia, obstructive sleep apnea and osteoarthritis [1,4,6,10], it is also associated with increased death and decreased lifespan [13]. Persons with BMI between 30 to 35 kg/m^2, have an expected decrease in lifespan by 2 - 4 years, while lifespan decrease more in those with morbid obesity with BMI ranging from 40 to 45 kg/m^2 by 28 - 10 years [13]. Weight loss is associated with decrease in mortality [14] this reduction in body weight can be achieved by many strategies including change in lifestyle, diet regimen and pharmacological treatment [1], but these options are limited in morbid obesity and not effective [12]. Bariatric surgery, however is considered to be the most effective solution for morbid obesity cases [1,12] to decrease morbidity and mortality related to increased BMI [15]. This surgery performed to those with limited response to other options for weight loss [3]. Patients having severe obesity related to morbidity with BMI > 35 kg/m^2 and those with BMI > 40 kg/m^2 were established for bariatric surgery as the National Institute of Health mentioned in 1991 [16]. Bariatric procedure depends on 2 strategies reducing the oral intake and decreasing absorption [1]. There are many types of Bariatric procedures, the choice of its type depends on patient's medical, psychological, and social issues [1]. Obesity not only causes medical disorders but also psychiatric problems [2]. Psychiatric problems and disorders are related to high BMI [3] and more prevalence in morbid obesity patients than those with lower obesity [17], those very obese persons are 5 times more likely to have depression [18]. Psychiatric disorders include anxiety disorders, depressive disorders such as major depressive disorder, eating disorder such as binge eating disorder [5,12], mood disorders and low self-esteem [1]. The Psychiatric disorders are common for patients seeking bariatric surgery [12] and show high rates especially in obese woman such as depression [13,15,19], almost 40% of bariatric surgery candidates have at least one psychiatric problem [5]. Bariatric surgery has a role in improving Psychological problems in morbidly obese patients [12], actually it was found that this surgery had high positive effect post operatively [2]. Van Hout and Van Heck reported an improvement in many personality features including depressive disorders, body image and eating pattern [20]. So the aim of this study was to find the Psychological effect on the patients who do bariatric surgery after 8 - 12 months.

Materials and Methods

Subjects

This study was performed on 350 bariatric surgery persons from Military hospital of Prince Sultan Military Medical City and Dr. Sulaiman Al Habib Hospital (obesity treatment centers) in the period from 26th December 2016 to 12th January 2017.

Patient questionnaire

A Saudi questionnaire established according to likert scale 5 point questionnaire. The questionnaire included 19 items to investigate the psychiatric improvements, the highest score was recorded for the best improvements, lower score for lower improvements while lowest score was for negative outcome. The questionnaire used reflects very good reliability and internal consistency of the items (The Cronbach's alpha was scored at 0.888), so there was no exclusion. Patients answered this questionnaire freely without stressing or being obligated.

Statistical analysis

Data were analyzed by dint of Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Continuous variables were represented as mean ± standard deviation and categorical variables were expressed as percentages. The t-test was used in favor of continuous variables. The Cronbach's alpha was used to assess reliability and internal consistency of the items in the questionnaire. P-value < 0.05 was considered statistically significant.

Results

This study included 350 persons who performed bariatric surgery, the number of male was 243 representing 69.4 % of the participants, while female number was 107 (30.6%). Most of persons were Saudi representing 93.7% (328 persons), while few were non-Saudi

22 persons only representing 6.3% of this study. Also most of urban was included in this study 329 with a percent of 94% higher than the rural persons who were 21 (6%) only. According to smoking the smokers were 144 (41.1), however the nonsmokers were more dominant, they were 175 persons representing 50% of the present study, X-smokers were the least category of only 31 person (8.9%). Regarding the practice of physical activity, the more dominant category did not practice activity and it represents 62.3% (218 persons) whereas persons practice physical activity were 37.7% (132 persons). Table 1 summarizes the mean of age, height, and weight before surgery, current weight, body mass index before and after surgery for male, female and for all subjects collectively.

Characteristics	All subjects N = 350	Male N = 243	Female N = 107	*P-value
AGE	36.30 ± 10.40	37.12 ± 9.92	34.42 ± 11.27	0.034
Height	170.53 ± 8.93	174.4 ± 6.68	161.75 ± 6.98	0.001
Weight before surgery	128.16 ± 26.94	135.05 ± 26.21	112.59 ± 21.61	0.001
current weight	76.20 ± 14.69	80.3 ± 14.35	66.89 ± 10.69	0.001
BMI before surgery	43.95 ± 7.89	44.3 ± 7.59	43.15 ± 8.53	0.233
BMI after surgery	26.10 ± 4.05	26.37 ± 4.33	25.5 ± 3.26	0.056

***Table 1**: comparison between the studied subjects according to baseline characteristics*

**P- value: Comparison between Male and Female; BMI: Body Mass Index; N: Number of Patients.*

At the present study, there were significant differences between male and female regarding age, high, weight before surgery and current weight, while there was no significance in BMI before and after surgery. The results of the items were represented by mean, the mean of good psychological score was > 2.5, while the mean of bad psychological score was < 2.5.

The results of questionnaire are summarized in table 2 for all subjects and regarding sex. Most of scores showed a very good psychological score.

Item number	Statement	All subjects		Male		Female		P-value
		Mean	SD	Mean	SD	Mean	SD	
Q1	I feel annoyed / sad when looking at mirror	4.07	(1.13)	4.09	(1.12)	4.00	(1.16)	.471
Q2	I feel ashamed when going to clothes stores asking for baggy clothes	4.09	(1.14)	4.16	(1.14)	3.92	(1.14)	.061
Q3	I suffer from insomnia	4.12	(1.04)	4.16	(1.01)	4.04	(1.10)	.323
Q4	I feel upset for trivial reasons	4.11	(1.04)	4.12	(1.02)	4.07	(1.08)	.625
Q5	I feel nervous for trivial reasons	4.07	(1.00)	4.10	(0.97)	4.02	(1.06)	.391
Q6	I quarrel repeatedly with a house member throughout the day	4.07	(1.08)	4.04	(1.07)	4.15	(1.11)	.454
Q7	I suffer from anorexia	2.57	(1.34)	2.53	(1.37)	2.64	(1.29)	.512
Q8	I suffer from increased appetite	4.26	(1.04)	4.25	(1.05)	4.27	(1.00)	.465
Q9	I don't acquire new friends	4.00	(1.13)	3.97	(1.13)	4.07	(1.13)	.276
Q10	I feel sad for no reasons	4.15	(1.02)	4.19	(0.97)	4.06	(1.15)	.911
Q11	I think of the possibility of marriage in the near future	3.69	(1.45)	3.57	(1.51)	3.95	(1.30)	.018
Q12	In case of being married, do you think of divorce?	4.51	(0.79)	4.43	(0.84)	4.68	(0.66)	.004
Q13	Now I feel self-confidence less than before the operation	4.51	(0.89)	4.49	(0.96)	4.57	(0.73)	.439
Q14	I feel tired of the least effort	4.16	(1.06)	4.16	(1.06)	4.14	(1.05)	.851
Q15	I wake up early at the middle of night and become unable to return to sleep	4.21	(0.96)	4.26	(0.93)	4.08	(1.02)	.280
Q16	I am worried about my job	4.32	(0.96)	4.36	(0.88)	4.23	(1.12)	.110
Q17	I feel depressed	4.29	(1.02)	4.35	(0.97)	4.15	(1.12)	.104
Q18	I think of committing suicide	4.57	(0.72)	4.55	(0.72)	4.61	(0.71)	.502
Q19	I feel moody	4.00	(1.12)	4.05	(1.11)	3.89	(1.14)	.215
	Total score for all items out of 95	77.82	(11.55)	77.68	(11.38)	78.14	(11.97)	.738

***Table 2**: Mean of each question in the questionnaire for all subjects and each gender*

**P-value; significant at < 0.05, Mean > 2.5 for good psychological score, Mean < 2.5 for bad psychological score, SD: Standard Deviation; Q; Question.*

Regarding gender there was a significant difference only in Q11 and Q12 where p-value was 0.018 and 0.004 respectively.

An assessment for psychological score was performed to demonstrate the psychiatric effect on the bariatric surgery patients present in table 3. A very good psychological score was obtained for 274 patients (78.29%), while bad score was recorded only for 7 patients (2%) of all persons involved in this study.

Range of score	Interpretation of score	Frequency (%)	
72 - 95	Very good	274	(78.29)
48 - 71	Good	69	(19.71)
24 - 47	Bad	7	(2.00)
< 24	Very bad	0	(0.00)

Table 3*: Assessing the psychological score of obese patients after bariatric surgery.*

Discussion

Candidates of bariatric surgery have psychiatric disorders represented in several disorders such as anxiety disorder and mood disorder [21,22]. Personality disorders, anxiety and mood disorders are higher in persons seeking bariatric surgery than controls [23,24]. Regarding psychological features Abiles., *et al*. [25] reported that higher levels of depression, anxiety, stress, lower scores of self-esteem and quality of life were higher in obese patients than normal body weight persons. Bariatric surgery has a positive effect on obesity and its related conditions and psychosocial functioning [26-28]. In a study on Swedish obese subjects between surgical group and group treated with diet and exercise, several psychosocial variables were compared in both groups, a significantly better outcome was observed in surgical group in depression, health perception, social interaction and psychosocial functioning [29]. Eating patterns including binge eating disorder and night eating syndrome which is characterized by morning anorexia are common in bariatric surgery candidates [30]. Almost 30 - 50% of patients suffering from morbid obesity have binge eating disorder before surgery [31]. Binge eating disorder is eating more food in short period of time than the most people [32]. A group of improvements was purposed by Van Hout and Van Heck [20] in the period between 1 to 2 years after bariatric surgery, these improvements include eating behavior, body image, depressive symptoms, social functioning, personality features and psychopathology. In the present study increased appetite was not common, where the mean was 4.26, as well as anorexia but with less degree (mean 2.57), this was in agreement with several studies by Muller A., *et al*., Wadden TA., *et al*. and Wolfe BL [33-35] who reported an improvement in eating behavior, also decrease in hunger and more control in eating were reported by most of patients [35,36], this show the positive effect of bariatric surgery on the eating behavior. People with psychiatric disorders have less bodyweight loss [37] and this can be noticed in another eating behavior; Night eating syndrome was associated with greater postsurgical BMI after surgery, so improving eating behavior depends on the effectiveness of surgery. In this study the mean of BMI after surgery 26.10 ± 4.05 highly decreased than BMI before surgery 43.95 ± 7.89 and this explains the improvement of eating behavior after the surgery. Regarding sex in the eating behavior there was no significant difference between male and female, while a study by Lin HY., *et al*. [6] they found that females had higher prevalence of eating disorders than males. Body image is more common in patients suffering from obesity and this is correlated with depression symptoms [38]. In woman body image dissatisfaction is more common than in men and this is associated with low self-esteem, higher incidence of depression and perfectionism [39,40]. There are several studies reported that body image impairment and lack of familiarity with the body have been improved after bariatric surgery [28,41-44], this is in agreement with this study, where good degree was obtained (mean = 4.07) for body image, but there was no significant difference between male and female P- value at 0.471. This enhance the effective role of bariatric surgery in psychiatric problems. However, in two studies by Teufel M., *et al*. and Van Hout GC., *et al*. [24,40] it was demonstrated poor outcome for body image after surgery when compared to general population samples or non-obese populations. Dissatisfaction after surgery due to increasing and/or sagging skin represented 70% of patients in one study [45], also there are several studies reported that body image dissatisfaction after surgery was a result of the previous reason [27,28,41,46,47], so it was suggested that the cause of body image satisfaction was losing more weight [41]. Depressive symptoms were reported in 25 - 30% of bariatric patients at the time of surgery and to 50% report a lifetime history of depression [18]. Most of several studies have reported an improvement and decrease after bariatric surgery in depression which is one of the mood disorders [27,30,35,40,48-52], in the present study, an improvement was obtained for participants where mean was 4.29 representing high positive outcome, also being moody declined (mean 4.00). In a study by Lin HY., *et al.* [6] they found that mood disorders were more com-

mon in females than in males seeking bariatric surgery, however females show more decreasing in depression after surgery than males [53], but in the current study there was no significant difference regarding gender, P-value 0.104. In a cohort study by Mirabelli., *et al.* [54] they demonstrated that people with severe obesity may have an increased mortality by suicide. Several studies were established to study patients'suicide after bariatric surgery, a great number of suicide was recorded for the surgical group [55,56]. In the current study there was no committing suicide, mean = 4.57, however these persons should be followed up after surgery to assess and support the patient's psychological well-being. In this study other several psychiatric disturbances have been investigated and there was good outcome and improvements in psychological features after bariatric surgery, this can be seen in the values of mean that exceeds 2.5 reflecting good improvements. The result for assessing the total psychological score of obese patients after bariatric surgery was very good where, most of patients 78.29% have shown very good psychological improvements, while good one was recorded for 19.71%, only 2% of participants did not improve. These promising results prove the positive outcome and effectiveness of bariatric surgery on psychiatric effect.

Conclusion

Bariatric surgery has good effect on psychiatric disorders and lead to an observed improvement for psychological characteristics of patients.

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