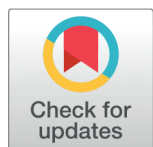


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Impact of bariatric surgery on body image satisfaction among patients attending King Saud medical city

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Abstract

Objectives: The aim of the study is to assess the impact of bariatric surgery on body image among patients from King Saud medical city using unmatched case-control study among 94 pre-bariatric surgery and 94 post bariatric surgery, selected through systematic random sampling. **Findings :** bariatric surgery improved body image during the first year, and post-surgery patients are 5 times likely to have positive body image than pre-operative ($p < 0.01$). There is a need for psychological care for preoperative patients, since number of patients from pre-bariatric surgery group shown symptoms of body dysmorphic disorder. Further research is needed regarding psycho-social factors that could have an impact on body image. **Novelty:** This is an original research. Data was collected by body image questionnaire. Analysis was done using SPSS with significance level set at $p < 0.05$. t-test was used to compare the mean body image scores, higher the scores reflecting higher body image impairment. Verbal consent was taken from participants and the subjects' confidentiality is maintained by researchers.

Keywords: Bariatric surgery; Body image; Patients; King Saud Medical City; Saudi Arabia

1 Introduction

Obesity is considered as one of the major global epidemic problems recently; this issue leads to increasing the rate of bariatric surgery⁽¹⁾. Bariatric surgery is a procedure that leads to long term weight loss⁽²⁾. It is required to be conducted when body mass index (BMI) exceeds 35 or when individuals who suffer from obesity fail to lose weight and have serious health issues⁽³⁾. Self-body satisfaction is one of the aspects of body image which is defined as perception whether it is positive or it is negative toward person's own body^(4,5). One study reported that satisfaction towards the body is related to BMI, and this surgery makes a big change in the body image that affects psychological health⁽⁶⁾.

Although bariatric surgery is effective in reducing comorbidities, people seeking bariatric surgery to improve their body image, and it results from the importance of body image⁽⁷⁾. A cross-sectional study in Germany measure appearance evaluation and orientation before and after procedure the result shows post-surgery patients have better evaluation in appearance by 20% even though they have excess skin, since the great transition they observed. Furthermore, it was significantly higher in bariatric surgery patients with body contouring by approximately 30%. This result indicates that loose skin reduces positive perception of body image^(8,9). The effect of bariatric surgery on body image satisfaction depends on the age as shown in cohort study conducted in Qatar among adolescents to evaluate the post-surgical improvements of body image for five years. The difference of change in body image is 11% in the first year and approximately 14% the overall change in five years. These results support the suggestion that appearance concern declines with age^(10,11). Poor body image is a common symptom among people with obesity that leads to psychological adverse effects, with obesity epidemic there is accelerated growth in the number of bariatric surgeries performed in the world including Saudi Arabia. one from every thousand Saudis is having bariatric surgery^(7,12); Hence, measuring body image is crucial after bariatric procedure due to the massive weight lose that gives rapid changes in physical appearance, this will alter body perception which lead to disturbed body image⁽⁹⁾. This study intends to assess the impact of bariatric surgery on body image among patients from King Saud Medical City (KSMC).

2 Materials and Methods

Unmatched case-control study conducted in bariatric center at king Saud Medical City, which is the largest center for bariatric surgery in the Kingdom of Saudi Arabia⁽¹³⁾. Patients were divided into cases defined as adult patients had bariatric surgery in the year 2018. Patients older than 55 years, and those who undergone bariatric surgery less than three months are excluded. For the control adults who are under 55 years in waiting list for bariatric surgery are included. Data was collected by interviewer administered Body Image Questionnaire (BIQ)⁽¹⁴⁾ consisting of two parts. The first part describes demographic characters of the participants related to the objective of the study, and it consist of 6 questions. Second part was about self-perception of body image from Kings College London, it consists of 9 questions. The scoring of the questions is by using Likert scale each item is scored from 0 (least impaired) to 8 (most impaired). The score is achieved by summing 9 questions. The total score ranged from 0 to 72 with a higher score reflecting greater impairment and symptoms of Body Dysmorphic Disorder (BDD). Individuals who score 40 or more are likely to have a diagnosis of BDD⁽¹⁴⁾. The scale was validated by Dr. Veale, et al. It has acceptable internal consistency (Cronbach's alpha= 0.91), test-retest reliability ($r = 0.87$, $p < 0.01$), and convergent validity; it is correlated highly with the Body Image Quality of Life Inventory ($r = -0.68$, $p < 0.01$). Hence, the lower the scores on this scale are correlated with higher body image quality of life⁽¹⁵⁾.

2.1 Statistical analysis

Data was analyzed using the Statistical Package for Social Sciences SPSS with significance level set at 0.05. The total size of the sample is 188 (cases= 94, and controls= 94) calculated for unmatched case-control study through "Open Source Epidemiologic Statistics for Public Health"⁽¹⁶⁾ with 95% confidence interval, 80% power, a ratio of 1:1 cases to controls and an expected exposure in cases 49% and controls 29%⁽⁸⁾. The subjects are selected through systematic random sampling method from the lists that was provided from KSMC obesity center for both cases and controls. The descriptive data represented as mean, standard deviation frequency count, and percentage. T-test was used to compare between the two samples body image scores for testing the primary hypotheses. Association magnitude of bariatric surgery and body image was estimated by Odds Ratio.

The study was conducted after Institutional Review Board (IRB) approval from both Princess Nourah University, and KSMC. Informed consent with objectives and interview duration was given verbally to the subjects before taking the decision to participate; the privacy and confidentiality of subjects' information is guaranteed and protected by researchers.

3 Results

3.1 Sociodemographic data

Table 1 demonstrates Socio-demographics characteristics of the studied sample. Regarding the age of participant in preoperative and postoperative is almost the same and it is about 33 years. More than half of participant were females for both pre and postoperative populations (58 % and 57% respectively). Regarding the marital status, the highest percentage for the post-operative was (49%) for single whereas for the preoperative the highest percentage was married (51%). In term of education thirty-six percent of the preoperative have high school diploma and thirty-seven percent of the postoperative have bachelor's degree.

Table 1. Socio-demographic characteristics of studied sample.

Variable	Preoperative	Postoperative	Total
Age (M \pm SD)	33.4 \pm 9.2	33.9 \pm 9.3	33.8 \pm 9.4
Gender n (%):			
Males	39 (41.4)	40 (43)	79 (42)
Females	55 (58.5)	54 (57)	109 (58)
Marital Status n (%):			
Single	34 (36.2)	46 (49)	80 (43)
Married	51 (54.2)	40 (43)	91 (48.4)
Divorced	7 (7)	7 (7)	14 (7.4)
Widowed	2 (2.1)	1 (1)	3 (1.6)
Educational Level n (%):			
Less than high school	21 (22.3)	15 (16)	36 (19.1)
High school	34 (36.1)	33 (35.1)	67 (35.6)
Bachelor's degree	28 (30)	37 (39.3)	65 (34.5)
Postgraduate degree	6 (6.4)	4 (4.2)	10 (5.3)
Diplomas	5 (5.3)	5 (5.3)	10 (5.3)
BMI (M \pm SD)	6.2 \pm 9.9	30.6 \pm 5.8	38 \pm 11.2

3.2 Comparison between body image scores before surgery and after surgery

Regarding scores of checking feature(s) on mirrors, it was shown that is significant ($p < 0.05$). For the item feeling of unattractiveness about features was highly significant ($p < 0.001$). For item the effect of features in creating distress was significantly higher in preoperative ($p < 0.001$). For the activity avoidance, the scores were the same in both cases and controls ($p = 0.913$). For item of feature currently preoccupy on Preoperative was higher than preoperative also statistically significant ($p < 0.05$), For item affect features on the relationship with existing partner was high on preoperative and statistically significant ($p < 0.05$), For item of interfere the features on ability to work or study on preoperative was high and highly statistically significant ($p < 0.001$), the feature interfere with social life on preoperative was high and highly statistically significant ($p < 0.001$), For item the importance of the features was insignificant between before and after surgery ($p = 0.193$). Table 2

3.3 Strength of the association between bariatric surgery and body image

It was found that postoperative group is five times ($OR = 5.4$, 95% $CI = 2.53-11.34$) more likely to experience positive body image than preoperative. 39 out of 94 preoperative patients have a negative body image or scores higher than 40 (Table 3).

Table 2. Comparison between body image scores before surgery and after surgery.

Items	Preoperative (mean \pm SD)	Postoperative (mean \pm SD)	t	P-value
1) How often do you deliberately check your feature(s)	4.5 \pm 2.8	5.3 \pm 2.4	-2.14	0.034*
2) How much do you feel your feature(s) are currently ugly, unattractive or 'not right'?	4.7 \pm 3.1	2 \pm 2.5	6.743	0.00**
3) How much does your feature(s) currently cause you a lot of distress?	5 \pm 3.1	1.5 \pm 2.3	8.626	0.00**
4) How often does your feature(s) currently lead you to avoid situations or activities?	4.6 \pm 3.3	4.6 \pm 3.4	-0.87	0.931
5) How much does your feature(s) currently preoccupy you	4.1 \pm 3.1	3 \pm 3.2	2.336	0.021*
6) How much does your feature(s) currently have an effect on your relationship with an existing partner? If you do not have a partner, how much does it have an effect on dating or developing a relationship?	4 \pm 3.2	2.4 \pm 3	2.446	0.016*
7) How much does your feature(s) currently interfere with your ability to work or study, or your role as a homemaker?	3.7 \pm 3	1 \pm 2.1	7.439	0.00**
8) How much does your feature(s) currently interfere with your social life?	3.3 \pm 3	1.4 \pm 2.2	5.053	0.00**
9) How much do you feel your appearance is the most important aspect of who you are?	4 \pm 3.1	4.6 \pm 3.4	-1.307	0.193
Total Scores	36.23 \pm 15.2	24.8 \pm 10.23	6.051	0.00**

Table 3. Measure of association between bariatric surgery and body image.

Group	Body Image		Total
	Positive	Negative	
Postoperative	83	11	94
Preoperative	55	39	94
Total	138	50	188
	Value	95% CI	
Odds Ratio for group postoperative/ preoperative	5.4	Lower 2.53	Upper 11.34

4 Discussion

The study aims to assess the impact of bariatric surgery on body image among patients from King Saud Medical City. The studied sample mean age was around 34 years majority were distributed in high school and bachelors' level almost equally, nearly half of the participants are married, and only two fifths are males. The study findings revealed that bariatric surgery have a high significant impact on body image. Patients who undergone surgery are five times likely to have positive body image than pre-surgical patients. The mean scores of postoperative is 31.5% lower than the preoperative group, this is similar to a study conducted in Germany have the same rate difference between patients before bariatric surgery and patients after surgery with body contouring although KSMC postoperative undergone bariatric procedure without body contouring surgery⁽⁸⁾. This effect might be because post-operative participants in this study are much younger than participants in German study as the skin elasticity decrease with age⁽¹⁷⁾, also the BMI is higher in Germany than the studied population. Another Saudi study was done among subjects performed bariatric surgery which contradicts with our findings, conclude that bariatric patients have distorted body image as it leads to functional and mental impairments they suggested that body contouring surgery should be

included in the management of obesity⁽¹⁸⁾. However, in our studied sample the preoperative patients have a mean total body image score equals 36.23 with a great variation, as higher scores reflecting higher impairment and more likely to be diagnosed with BDD. This indicates the need for more psychological care and management for the surgical candidates especially in the prolonged waiting time. The current study showed that postoperative subjects are significantly have higher mean in the frequency of checking feature(s), since the majority were female and recently lost their excess weight it is normal to frequently check their look.

This study found a highly significant difference in rating of unattractive or ugly feature(s), and Distress caused by feature(s) between cases and controls. This is also evident by a study conducted in Saud Arabia which showed a moderate rate of acceptance of the Saudi population toward cosmetic surgery (43.9%) for social reasons, and they wanted some new cosmetic procedures⁽¹⁹⁾.

observed among patients. However, a cohort study conducted in Qatar among adolescent using the same questionnaire found a high significant difference in rating of unattractive or ugly feature(s), and for Distress caused by feature(s) was insignificant before and one year after procedure⁽¹⁰⁾. The reason might be because the adolescents have more concerns and experience inferiority regarding their appearance than adults⁽²⁰⁾. Other study conducted in Saudi Arabia showed different result regarding appearance distress for patients undergone surgery as they rate it with good psychological scores meaning they have less appearance distress⁽²¹⁾.

Avoidance of activities and situations was insignificant difference between cases and controls, although feature(s) interference with their social life was higher in controls ($p < 0.001$). it could be interpreted by the importance of the appearance since both pre and post-surgery rate the importance of appearance moderately important ($p = 0.19$), so they tend to think and concern about appearance but it is not fully related to their identity or to put pressure to avoid situations; the importance may be because of the age and gender of the subjects as most of them are females and have mean age in thirties, in a study about body image satisfaction, appearance importance, and self-esteem among black and Caucasian women found appearance importance remain the same in both during middle age⁽²²⁾.

Also a systematic review conducted MEDLINE and Cochrane databases searched from 1989 to July 15, 2016 conclude that that the bariatric surgery provides successful and sustained effects on weight loss and ameliorates obesity-attributable comorbidities in the majority of bariatric patients⁽²³⁾. For inability to work/study due to feature(s), it was expected difference as it is evident that bariatric surgery enhances their physical ability⁽²⁴⁾. Finally, preoccupation with feature(s) and interference with partner relationship or dating improved significantly after surgery. This attributed to preoperative may think negatively about body that leads to overthinking so they analyze and interpret any issue with partner based on their negative body perception⁽²²⁾, so when the problem regarding excess weight solved they will be more confidence which increase their optimism.

5 Conclusion

Bariatric surgery has an effect on body image among KSMC patients. Patients after procedure are 5 times likely to have positive body image. However, proportion of pre-bariatric surgery group have scores exceed 40 which reflect the risk of having BDD; hence psychological counselling should be provided for patients who are going to perform surgery. The perception of body image in adulthood could be related to psycho-social factors, which indicates the need for further research to explore the psychological and social factors that might affect body image.

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