

ORIGINAL ARTICLE

Psychosocial profile of obese patients scheduled for bariatric surgery versus those receiving conservative treatment

Ahmed E.H. Shendi, Magda T. Fahmy, Ashraf M. El Tantawy, Khalid A. Anwar, Mona Elsayed
Department of Psychiatry, Faculty of Medicine, Suez Canal University, Suez Canal, Egypt.

Correspondence to Mona Elsayed, Assistant Professor of Psychiatry, Faculty of Medicine, Suez Canal University, Suez Canal, Egypt

E-mail: monaneuro_24@yahoo.com

Aim	This was a comparative cross-sectional study to assess a variety of psychosocial and motivational differences among obese individuals choosing bariatric surgery versus those choosing conservative weight-loss strategies.
Patients and Methods	Obese patients were recruited from Suez Canal University Hospital grouped as 20 for the surgical group and 20 for conservative weight loss program, as well as 20 obese individuals with no treatment as the control group. All studied groups underwent the following assessments: sociodemographic data, BMI, Mini-International Neuropsychiatric Interview, Big Five Personality inventory, eating behavior disorder using Eating Disorder Examination Questionnaire, and motivation to lose weight using Weight Loss Motivation Questionnaire.
Results	Obese patients choosing surgery were older, of high socioeconomic status, from urban area, and having significantly higher BMI in the surgical group compared with the nonsurgical group. The mean BMI was 46.7 ± 11.18 in the surgical group versus 36.95 ± 5.36 in the nonsurgical group. The surgical group was found to have social anxiety in 75% of cases compared with 35% of cases in the nonsurgical group, and just 15% in the control group. The surgical group was found to be much more significantly motivated to lose weight. Appearance to others was the most significant factor that motivated them to lose weight.
Conclusions	There are significant psychosocial and motivational differences between obese individuals choosing surgery and those choosing conservative weight loss strategies. These differences contribute in choosing the method of treating obesity regardless of obesity-related medical comorbidities.
Keywords	Bariatric, Obese, Psychosocial. Egyptian Journal of Psychiatry 2023, 44:39–47

INTRODUCTION

Obesity is becoming an epidemic problem worldwide. A total of 107.7 million children and 603.7 million adults were obese (Collaborators, 2017).

Medical therapy and conservative weight-loss strategies are frequently used to help obese patients with weight reduction but are often insufficient for achieving meaningful and sustainable results. In contrast, bariatric surgery has proven to be the most effective intervention for securing significant weight loss and improvement of associated comorbidities (Phillips and Shikora, 2018).

Bariatric surgery is recommended for individuals with a BMI more than 40 kg/m² or individuals with a BMI of 35–40 kg/m², with significant obesity-related comorbidities. Increasingly, it is considered for those with lower levels of obesity of less than 35 kg/m² with poorly controlled type 2 diabetes (Garvey *et al.*, 2016).

In general, the individual's ability to regulate behavioral changes, such as diet and physical activity, are considered factors central to achieving sustained weight loss after both surgical and nonsurgical weight loss interventions.

Yet, little is known about the psychological prerequisites for weight loss maintenance after bariatric surgery (Wimmelmann *et al.*, 2014).

Literature reviews of bariatric surgery outcomes reveal varying results when individual psychological predictors for weight loss and weight loss maintenance are studied, so it is necessary to include a wider range of psychological predictors in studies of postoperative behavior change and incorporate short-term versus long-term predictors of postoperative weight loss (Livhits *et al.*, 2012).

Therefore, this study compares specific psychosocial and motivational perspectives in samples of surgical and nonsurgical obese patients, which can increase our knowledge about potential predictors of postsurgical outcome regarding treatment adherence and long-term success, thereby improving presurgical selection process and assessment.

PATIENTS AND METHODS

This was a comparative cross-sectional study to assess a variety of psychosocial and motivational differences among obese individuals choosing bariatric surgery to treat obesity versus those choosing conservative weight-loss strategies.

A total of 40 obese patients were recruited from Suez Canal University Hospital clinics (surgery and obesity): 20 patients who chose surgery as the treatment for obesity and 20 patients who chose conservative weight loss program as the treatment for obesity. Moreover, a control group of 20 obese individuals who are neither part of a conservative weight loss program nor surgery program was included. The control group was selected from obese individuals, either workers in hospital or relatives to patients in the hospital, who accepted to participate in the study.

Inclusion criteria

All obese individuals fulfilling the following criteria were included:

- (1) Those with BMI more than 30.
- (2) Those between 18 and 45 years of age.
- (3) Those who accepted to participate in the study and were fulfilling the above criteria.

Exclusion criteria

All obese individuals fulfilling the following criteria were excluded:

- (1) Those suffering from any current medical comorbidities such as diabetes, hypertension, ischemic heart diseases, or other chronic medical diseases.
- (2) Those who did not accept to participate in the study.

Sample size and sampling method

The sample size was calculated according to the following equation (Toutenburg and Fleiss, 1974; US Department of Health and Human Services, 2020):

$$n = 2 \times \frac{\left[(Z_{\alpha} + Z_{\beta})^2 \times (SD_1^2 + SD_2^2) \right]}{(X_1 - X_2)^2}$$

Where C is a constant and it equals 7.85 at $\alpha=0.05$ and power of study of 80%, SD_1 is the SD of quality-of-life survey among conservatively treated patients=10.9; SD_2 is the SD of quality-of-life survey among surgically treated patients=9.4; \bar{X}_1 is the mean of quality-of-life survey among conservatively treated patients=41.4; and \bar{X}_2 is the mean of quality-of-life survey among surgically treated patients=31.9.

A 10% expected dropout was added. Therefore, 20 patients were included for each group (surgical group and nonsurgical group), with a total of 40 patients in both groups.

Inclusion criteria

Sociodemographic characteristics, including age, sex, residence, marital status, and socioeconomic status of the studied sample, were identified (El-Gilany *et al.*, 2012).

For surgical, nonsurgical, and control groups, BMI was calculated, psychiatric assessment using Mini-International Neuropsychiatric Interview was conducted (Lecrubier *et al.*, 1997), personality dimensions were measured using Big Five Inventory (John *et al.*, 1991), eating behavior disorder was assessed using Eating Disorder Examination Questionnaire (Fairburn, 2008), and motivation to lose weight was explored with Weight Loss Motivation Questionnaire (Meyer *et al.*, 2010).

Ethical consideration

- (1) Written consent was obtained from all participants with full explanation of the aim and methods of the study.
- (2) The participants had the right to withdraw from the study at any time without any consequences.
- (3) Confidentiality of all data and test results of all the study population were preserved.
- (4) Data collection was performed at suitable time and place.

RESULTS

Table 1 describes the sociodemographics of the studied groups, showing a statistically significant difference between surgical and nonsurgical obese groups regarding age, residence, and socioeconomic status.

Table 2 shows a statistically significant difference between surgical and nonsurgical obese groups regarding BMI.

Table 3 lists psychiatric disorders among the studied population, showing a statistically significant difference between both surgical and nonsurgical obese groups and surgical and control groups regarding the presence of social anxiety disorder.

Table 4 describes EDE-Q findings among the studied groups, showing a statistically significant difference between surgical and control obese groups, but not between surgical and nonsurgical groups, regarding eating concern, shape concern, weight concern subscale scores, and also the presence of eating disorder psychopathology.

Table 5 shows a statistically significant difference between surgical and nonsurgical groups regarding

appearance to others as a motivation for weight loss. It also shows a statistically significant difference between surgical and nonsurgical obese groups regarding total score of WLM-Q three subscales (health, appearance to others, and appearance to self).

Table 6 describes the big five personality dimensions among the studied population, showing a statistically significant difference between surgical and nonsurgical obese groups regarding the dimension of openness versus closeness to experience.

Table 7 shows that multiple regression analysis revealed BMI was the most important predictor among other predictors of choosing to receive obesity treatment.

Table 8 shows BMI as the most important predictor among other predictors of choosing surgery over a conservative method to treat obesity (Graphs 1–6).

Table 1: Sociodemographic variables of studied groups:

	Surgical group (N=20)		Nonsurgical group (N=20)		Control group (N=20)		P value
Age	34.75±5.17 ^a		28.95±6.04 ^b		31.6±3.8 ^{ab}		0.003*
Sex [n (%)]							
Male	6	30	3	15	6	30	0.4 (NS)
Female	14	70	17	85	14	70	
Residence							
Urban	20	100 ^a	11	55 ^b	20	100 ^a	0.001*
Rural	0		9	45	0		
Marital status							
Single	5	25	6	30	1	5	
Married	15	75	12	60	19	95	0.06 (NS)
Widow/divorced	0		2	10	0		
Socioeconomic status							
High	10	50 ^a	4	20 ^b	14	70 ^a	
Middle	8	40	8	40	6	30	0.003*
Low	2	10	8	40	0		

*Statistically significant difference, (a, b, ab) indicate statistically significant difference within groups (post hoc analysis) where means with similar superscripts indicate non-statistically significant differences.

Table 2: BMI among studied groups:

BMI	Surgical group (N=20)	Nonsurgical group (N=20)	Control group (N=20)	P value
Mean±SD	46.7±11.18 ^a	36.95±5.36 ^b	33.8±2.84 ^b	0.001*
Range	33–77	30–50	30–40	

*Statistically significant difference, (a, b) indicate statistically significant difference within groups (post hoc analysis) where means with similar superscripts indicate non-statistically significant differences.

Table 3: Mini-International Neuropsychiatric Interview of studied groups:

	Surgical group (N=20) [n (%)]		Nonsurgical group (N=20) [n (%)]		Control group (N=20) [n (%)]		P value
Major Depressive Episode	10	50	11	55	11	55	0.9 (NS)
Dysthymia	6	30	7	35	7	35	0.9 (NS)
Generalized anxiety disorder	11	55	13	65	15	75	0.4 (NS)
Social anxiety disorder	15	75 ^a	7	35 ^b	3	15 ^b	0.001*
Suicidal risk							
Low	19	95	18	90	19	95	
Middle	1	5	1	5	1	5	0.7 (NS)
High	0		1	5	0		

*Statistically significant difference, (a, b) indicate statistically significant difference within groups (post hoc analysis) where means with similar superscripts indicate non-statistically significant differences.

Table 4: Eating Disorder Examination Questionnaire findings among studied groups:

	Surgical group (N=20) [n (%)]	Nonsurgical group (N=20) [n (%)]	Control group (N=20) [n (%)]	P value
Eating disorder				
Yes	16(80)	15(75)	9(45)	0.04*
Psychopathology				
No	4(20) ^a	5(25) ^{ab}	11(55) ^b	
Subscales				
Restraint				
Mean±SD	3.03±1.35	2.66±1.72	1.79±1.76	0.05 (NS)
Eating concern				
Mean±SD	3.3±1.62 ^a	2.25±1.43 ^{ab}	1.73±1.49 ^b	0.006*
Shape concern				
Mean±SD	4.44±1.27 ^a	3.86±1.3 ^{ab}	3.05±1.22 ^b	0.004*
Weight concern				
Mean±SD	4.07±1.49 ^a	3.84±1.23 ^a	2.66±1.5 ^b	0.006*

*Statistically significant difference, (a, b, ab) indicate statistically significant difference within groups (post hoc analysis) where means with similar superscripts indicate non-statistically significant differences.

Table 5: Weight Loss Motivation Questionnaire findings of studied groups:

Subscale	Surgical group (N=20)	Nonsurgical group (N=20)	Control group (N=20)	P value
Health				
Mean±SD	3.36±0.56	3.05±0.67	2.97±0.93	0.2 (NS)
Appearance to others				
Mean±SD	2.77±0.92 ^a	1.91±0.91 ^b	1.84±0.77 ^b	0.001*
Appearance to self				
Mean±SD	3.28±0.89	2.95±0.89	3.05±0.89	0.5 (NS)
Total score				
Mean±SD	3.3±0.8 ^a	2.65±0.67 ^b	2.65±0.81 ^b	0.01*

*Statistically significant difference, (a, b) indicate statistically significant difference within groups (post hoc analysis) where means with similar superscripts indicate non-statistically significant differences.

Table 6: Big Five Inventory Findings among studied groups:

Big Five Personality dimensions	Surgical group (N=20)	Nonsurgical group (N=20)	Control group (N=20)	P value
Extraversion vs. introversion				
Mean±SD	3.03±0.49	2.84±0.58	2.99±0.46	0.4 (NS)
Agreeableness vs. antagonism				
Mean±SD	3.78±0.62	3.9±0.48	3.77±0.53	0.7 (NS)
Conscientiousness vs. lack of direction				
Mean±SD	3.37±0.78	3.2±0.58	3.5±0.42	0.3 (NS)
Neuroticism vs. emotional stability				
Mean±SD	3.4±0.53	3.62±0.67	3.45±0.52	0.5 (NS)
Openness vs. closeness to experience				
Mean±SD	2.9±0.48 ^a	3.34±0.59 ^b	3.17±0.57 ^{ab}	0.04*

*Statistically significant difference, (a, b, ab) indicate statistically significant difference within groups (post hoc analysis) where means with similar superscripts indicate non-statistically significant differences.

Table 7: Multiple regression analysis of predictors contributing to the choice of seeking obesity treatment versus seeking no treatment:

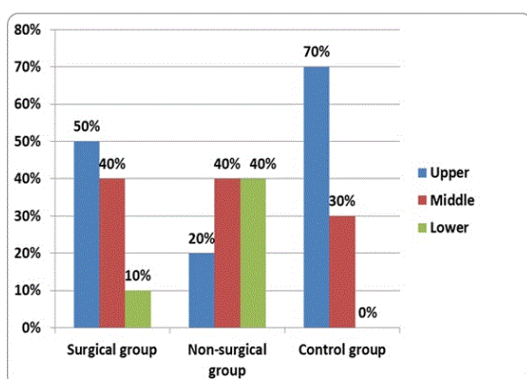
	Coefficient	95% CI	SE	Z	P value
Constant	-24.47	-43.3 to -5.6	9.62	-2.54	0.01*
Age	-0.05	-0.39 to 0.29	0.17	-0.3	0.7 (NS)
BMI	0.58	0.01-1.4	0.28	2	0.04*
Socioeconomic status	1.6	-0.8 to 4.01	1.2	1.27	0.2 (NS)
Social anxiety disorder (MINI)	1.75	-0.9 to 4.4	1.35	1.3	0.2 (NS)
Eating concern (EDE-Q)	0.29	-0.7 to 1.3	0.51	0.57	0.6 (NS)
Shape Concern (EDE-Q)	-0.49	-2.4 to 1.4	0.96	-0.52	0.6 (NS)
Weight concern (EDE-Q)	0.34	-1.6 to 2.3	0.99	0.34	0.7 (NS)
Appearance to others (WLM-Q)	0.212	-1.6 to 2.05	0.94	0.23	0.8 (NS)

*Statistically significant difference.

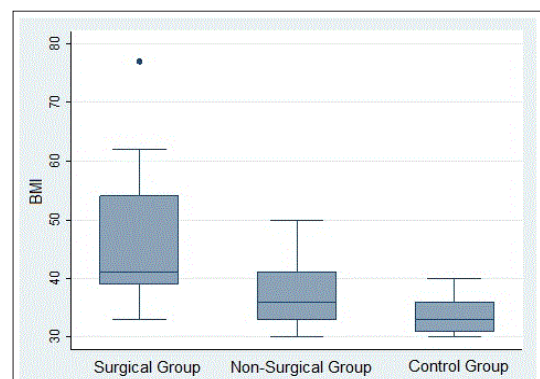
Table 8: Multiple regression analysis of predictors contributing to the choice of obesity treatment method (surgical vs. nonsurgical method):

	Coefficient	95% CI	SE	Z	P value
Constant	-11.44	-17.57 to -5.3	3.13	-3.66	0.001*
BMI	0.211	0.06-0.35	0.85	2.9	0.004*
Social anxiety disorder (MINI)	1.76	-0.18 to 3.16	0.67	2.62	0.009
Appearance to others (WLM-Q)	0.83	0.11-1.54	0.36	2.26	0.02

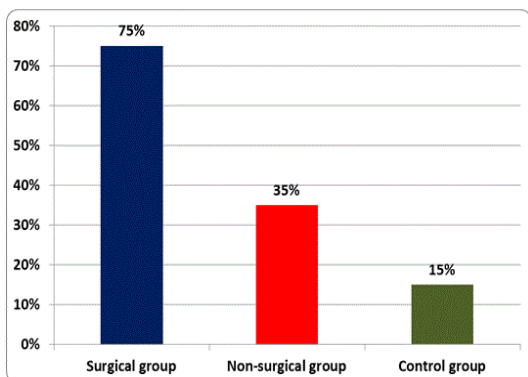
*Statistically significant difference.



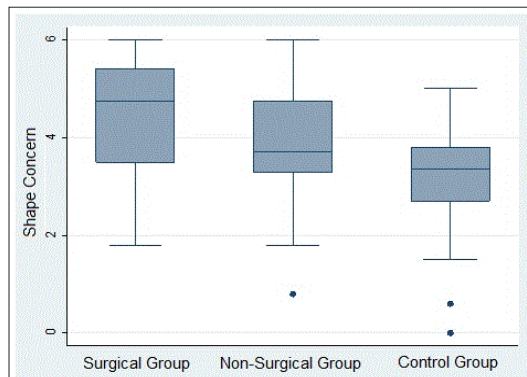
Graph 1: Socioeconomic status classification of studied groups.



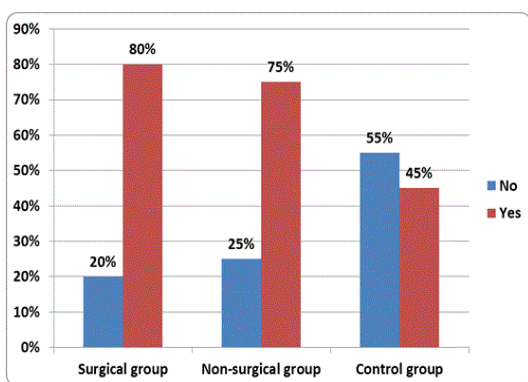
Graph 2: BMI distribution among studied population.



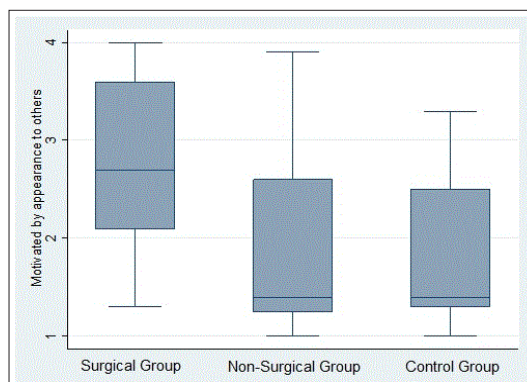
Graph 3: Social anxiety disorder among studied groups.



Graph 5: Shape concern subscale score among studied groups.



Graph 4: Eating disorder psychopathology among studied groups.



Graph 6: Appearance to others as a motivation for weight loss among studied groups.

DISCUSSION

In the current study, we tried to explore potential predictors of choosing bariatric surgeries among treatment-seeking obese patients, including sociodemographic characteristics, BMI, psychiatric morbidity, personality dimensions, eating disorder behavior, and motivation to lose weight.

Regarding sociodemographic characteristics, the results showed a statistically significant difference between surgical and nonsurgical groups regarding age, residence, and socioeconomic status, where obese patients choosing surgery were found to be older of high socioeconomic status and all of them living in urban areas. This can be explained by availability of services in urban than rural area. Obesity could be more accepted in rural than urban areas. Moreover, high education and financial aspects may play a role in selection of weight reduction methods.

However, in contrast to our sociodemographic findings, a study in Berlin investigated psychological differences between surgically and conservatively treated 244 obese patients and showed that surgically treated patients were younger and of lower socioeconomic state compared with conservatively treated obese patients (Ahnis *et al.*, 2015). This difference could be owing to differences in culture.

Moreover, regarding BMI, there was a statistically significant difference between surgical and nonsurgical groups, where surgical group patients tended to have higher BMI (mean, 46.7) compared with nonsurgical group (mean 36.95). Similarly, one study examining the differences between bariatric surgery patients and patients receiving conservative treatment found the surgical group had higher BMI and higher prevalence of women (Kvalem *et al.*, 2015). This could be explained by the fact that higher BMI needs more long-term diet restriction to reduce weight. So, the patients prefer vigorous rapid methods such as surgery.

Regarding psychiatric assessment of our studied population using Mini-International Neuropsychiatric Interview, there was a statistically significant difference, as 75% were found to have social anxiety disorder compared with 35% of the nonsurgical group, and just 15% of the control group had social anxiety disorder.

Interestingly, 80% of the surgical group was shown to have more than one psychiatric diagnosis compared with 70% of the nonsurgical group, highlighting the significance of psychiatric comorbidity among treatment-seeking obese patients.

Similar to our findings, one study on 393 obese patients from the largest Brazilian university-based bariatric center showed anxiety disorders to be the most common psychiatric disorder (46.3%) and generalized anxiety disorder as the most frequent disorder (23.9%) (Duarte-Guerra *et al.*, 2015).

In another study conducted on 146 consecutive bariatric surgery cases at the University Hospital of Erlangen, Germany, the overall prevalence of current Axis I disorders was 55.5%, and 72.6% had a lifetime history of at least one Axis I disorder (Mühlhans *et al.*, 2009).

Moreover, similar to our results, another study done in Catholic University, Rome, Italy, showed a high prevalence of social phobia (43%) both before and after surgery in comparison with healthy controls (Mirijello *et al.*, 2015). Therefore, obesity, which leads to social anxiety disorder, is considered a motive for patients to select vigorous rapid weight-loss strategies than long-term conservative methods.

Regarding exploring personality dimensions of the studied population, Big Five Inventory results showed there was a statistically significant difference between both surgical and nonsurgical groups on measurements only in opening versus closeness to experience.

Another study included 30 obese patients at a multidisciplinary obesity treatment center in Portugal, who were evaluated in different dimensions before surgery and 6 and 12 months after the procedure, and showed high mean scores of the neuroticism dimension (Generali and De Panfilis, 2018).

However, many studies examining personality traits and personality disorders among bariatric candidates have shown that patients choosing bariatric surgeries are very heterogeneous and that no one specific 'personality profile' characterizes these individuals (Silva and Maia, 2013).

Although the empirical findings regarding which specific personality traits can influence bariatric surgery outcome are still mixed and far from conclusive, in general, personality disturbances seem to reduce the chance of postsurgical weight loss, possibly by impairing the ability to adapt to the new postoperative conditions regarding the ability to implement lifestyle changes, to engage in physical activities, to change dietary habits, and finally, to develop strategies for coping and emotional control without using eating for this purpose. These capacities are likely to be driven and shaped by one's own personality characteristics (Marek *et al.*, 2017).

Regarding symptomatic assessment of eating behavior disorder among our studied population, the results showed no significant difference between surgical and nonsurgical groups, where 80% of the surgical group and 75% of the nonsurgical group showed features of eating disorder psychopathology, including dietary restraint attitudes, concern with eating, concern with shape, and concern with weight.

Results also showed that treatment-seeking obese individuals (both surgical and nonsurgical groups) differ significantly from the control group, as the control group showed less restraint attitudes and less concern with eating, shape, and weight when compared with treatment-seeking obese individuals.

Similar to these findings, other study showed that surgically and conservatively treated patients did not differ in the prevalence of eating disorder, binge eating disorder, or other specific eating behaviors. This lack of a difference may be owing to a ceiling effect, where after reaching a specific BMI, an eating disorder or a pathological eating behavior cannot become more pronounced (Meyer *et al.*, 2010).

Similar to our findings, another study showed that obese patients have elevated eating concern, which incorporates fear of losing control over eating, concern about being seen eating, and guilt about eating as well as high levels of concern about weight and body image (Abilés *et al.*, 2010).

Regarding exploring motivations for seeking obesity treatment using Weight Loss Motivation Questionnaire, the results showed that the surgical group was much more significantly motivated to lose weight when compared with the nonsurgical group. Further analysis showed that appearance in relation to others, specifically as a motive for weight loss, was significantly much more evident in the surgical group compared with the nonsurgical group and in both treatment-seeking groups when compared with the control group, highlighting the importance of such a motive in driving obese individuals toward seeking treatment. This could be explained by social stigma toward obese people and lack of their chance of appropriate social life.

Similar to our results, motivation for the choice of surgical treatment was investigated through a psychiatric semi-structured interview in Italy, where results showed that 50.6% reported esthetic appearance as the reason behind choosing surgical option compared with only 15.1% identifying worry about physical health as their primary motivation (Bancheri *et al.*, 2006).

However, a study where 208 participants were followed for at least 1 year after Lap-Band placement showed that medical conditions and health concerns account for 52%, appearance and embarrassment for 32% and poor physical fitness and physical limitation for 16% of first choices (Libeton *et al.*, 2004).

Moreover, in another study, patients were asked to rate from a list of benefits that they hoped to gain from bariatric surgery, and the results showed patients were primarily motivated to lose weight because of health concerns rather than to improve psychosocial or physical functioning (Wee *et al.*, 2006).

These different findings may be due to the fact that in our studied sample we excluded obese patients with current medical comorbidities such as diabetes, hypertension, and ischemic heart disease, which can explain why appearance

in relation to others as a motive to lose weight was much more significant than health issues among patients choosing surgery compared with the nonsurgical group.

Finally, multiple regression analysis of all statistically significant psychosocial and motivational differences among surgical, nonsurgical, and control groups showed that BMI was the most important predictor of choosing to treat obesity whether surgically or conservatively.

CONCLUSION

BMI, presence of comorbidities, level of education are related to the presence of anxiety and depression in patients with rheumatoid arthritis.

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Authors' contributions: authors including S.R. and H.S. participated together in the steps of design, background review, statistical analysis, result representation, and discussion. All authors have read and approved the manuscript.

LIMITATION OF THE STUDY

The following were the limitations of the study:

- (1) Small sample size.
- (2) All patients selected from Suez Canal University Hospital that lead to similarity in sociodemographic aspects.
- (3) Psychological assessment by multiple psychological tests was difficult for illiterate and low education patients.

CONCLUSION

There are significant psychosocial and motivational differences between obese individuals choosing surgery to treat obesity and those choosing conservative weight loss strategies. Socioeconomic state, BMI, social anxiety, and appearance in relation to other are the most prominent factors contributing to choosing the method of treating obesity regardless of obesity-related medical comorbidities and thus should be considered by bariatric surgeons as potential predictors of postsurgical long-term outcome regarding successful maintained weight loss and improved quality of life.

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Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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