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PSYCHOLOGICAL IMPACT OF WEIGHT MANAGEMENT INTERVENTIONS: ACHIEVED GOALS AND QUALITY OF LIFE

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PSYCHOLOGICAL IMPACT OF WEIGHT MANAGEMENT INTERVENTIONS: ACHIEVED GOALS AND QUALITY OF LIFE

Abstract

Obesity is becoming a major health problem growing in strength and prevalence. It is often associated with large array of debilitating diseases and conditions including psychosocial impairments. Morbid obesity rarely responds to conservative treatment regimens but has been successfully managed with bariatric interventions that have been achieving sustained weight loss of about 50% of excess body weight with improvement or resolution of most obesity-associated conditions. This cross sectional study evaluates the impact of weight changes by bariatric interventions on psychosocial functioning among Lebanese patients. 38 participants who signed consent were examined at pre-interventional and 6-month follow-up period. The spectrum of examination consists of demographic variables including height and weight measurements and psychosocial functioning evaluated through four standardized questionnaires well recognized and pretested in several previous studies. Data was analyzed using SPSS program. Positive impact of bariatric intervention was prevalent in approximately all studied parameters. This should be taken into consideration as a therapeutic tool in positive psychology-oriented intervention and necessitated pre-interventional psychological clearance and follow up as well.

Keywords

Obesity, Quality of Life, Psychological impact, Weight management

1. INTRODUCTION

Obesity is a worldwide major public health problem, which has been growing in strength over the past few decades, due to its increasing prevalence and its associations with higher morbidity and mortality from associated diseases (World Health Organization, 2018). Type 2 diabetes mellitus, hypertension, hyperlipidemia, accelerated atherosclerosis, debilitating osteoarthritis of weight-bearing joints, alveolar hypoventilation, obstructive sleep apnea syndrome, gastroesophageal reflux disease, infertility and urinary stress incontinence in women, certain cancers and sudden death are among the major co-morbidities (Xia, Lloyd-Jones, & Khan, 2019).). It has been proved that obese individuals are at increased risk of developing of psychosocial problems ranging from mood disorders to anxiety, depression and personality disorders resulting in body image dissatisfaction, reduced self-esteem and a large array of psychological illnesses, impairing activities of daily living and normal social incorporation (Romain, Marleau, Baillot, 2018). Substance abuses are documented among obese people as well as suicidal attempts (Castaneda, Popov, Wander, & Thompson, 2019).

Body mass index (BMI) is the most commonly used measurement in assessing obesity that is defined as BMI of 30 kg/m2 or higher. Severe or morbid obesity is defined as BMI of 40 kg/m2 or higher or a BMI of 35 kg/m2 or higher in the presence of progressive, serious and debilitating co-morbidities that cause a significant reduction in life expectancy and quality of life (Feng, et al, 2019). Morbid obesity rarely responds to conservative regimens as diet therapy, pharmaceutical treatments and psychotherapy but has been successfully managed with bariatric interventions that have been achieving sustained weight loss of about 50% of excess body weight with improvement or resolution of most obesity-associated conditions (Gromski & Sullivan, 2020). Bariatric interventions are based on gastric restriction and/or malabsorption (Almeanazel et al, 2020). Gastroplasty, gastric banding and gastric balloons are included in the gastric restriction group; the malabsorption group includes intestinal bypass, while gastric bypass and biliopancreatic diversion with duodenal switch are included in both groups (Rogers, 2020).

Hult et al (2020) reports that greater success following bariatric surgery appears to occur in young females who have a high self-esteem, good mental health, a satisfactory marriage and a high socio-economic status, which are self-critical and cope in a direct and active way (Hult et al, 2019). For male patients, Edward et al (2018) mentioned that those male participants reported that the life was challenging before surgery, while the surgery made some changes in their lives such as positive changes to their health, body image, social lives, and their self-esteem (II). Therefore, obesity should be regarded as a multidimensional construct including emotional, physical and social dimensions that reflect an individual's subjective evaluation and reaction to a health condition and its management should be interdisciplinary evolving psychopathologic approach and behavioral education alongside with bariatric interventions (1, 2, 6 and 10).

Furthermore, obesity has a substantial impact on a person's health-related quality of life (HRQOL); It has been observed that heavier people have greatest HRQOL impairment and that HRQOL varies in predictable ways as a function of whether or not treatment is sought and the type of treatment sought and that weight loss improves dramatically HRQOL (Kolotkin & Andersen, 2017). This mandates a thorough preoperative psychological evaluation of all individuals seeking weight management interventions emphasizing on relevant variables such as demography, personality, motivations, expectations, psychological functioning and psychiatric disorders. In fact understanding the relationship between the mentioned potential variables and the success after bariatric interventions will enable better patient selection and will help to improve outcomes (Garrett, Poppe, Wooding & Murphy, 2020).

The rate of obesity in Middle Eastern countries is increasing alarmingly and Lebanon is no exception (Kilpi et al, 2014). According to a study published in 2016, 53.5% of the Lebanese population is overweight and 18.16% is obese (Mallat et al, 2016). Interestingly, there has been changes in dietary habits particularly in the 20-30 years old age group living in large cities in Lebanon, which has had a direct effect on the burden of obesity among Lebanese population. In parallel with the increase in the rate of obesity, we note an increase in the use of bariatric surgery in the Middle East (Aridi, Khazen & Safadi, 2018). However, there are no national studies showing the impact of weight loss after bariatric procedures on psychosocial functioning.

The aim of our study is to evaluate the pre-operative and post-operative psychosocial status of patients who underwent a bariatric intervention. It is that, this study will increase the awareness of both physicians, nurses and patients about the necessity of psychological clearance prior to bariatric intervention in order to achieve the maximum goals and benefits.

2. METHODOLOGY

A cross sectional descriptive research design was employed. All patients seeking medical attention for weight management interventions from June 2018 to December 2019 were asked to participate in this study evaluating the psychological impact of bariatric procedures on their health and quality of life. After informed consent was obtained, participants completed, at the preoperative visit and at 6 months post intervention, a battery of standardized questionnaires evaluating self-attitudinal aspects of body image and the influence of appearance on one's life: Body Shape Questionnaire (BSQ) Cronbach alpha of 0.75, BECK Depression Inventory Cronbach alpha of 0.89, Rosenberg Self Esteem Scale; Cronbach alpha of 0.9 and Quality of Life (SF-36) health survey; Cronbach alpha of 0.8. Reliability and validity of the used questionnaires were demonstrated by different studies (Silva et al, 2016; García-Batista et al, 2018; Gómez-Lugo, et al, 2016; Bunevicius, 2017). Questionnaires were distributed with instructions for self-administration. Incomplete questionnaires were completed during short personal interviews or by phone conversation. Demographic data including age, sex, social and financial status were collected too. Measurements of height and weight were taken with the participants wearing no shoes and very light clothing. Height was measured to the nearest 0.5 cm using a standard physician's height stadiometer. Body weight was measured to the nearest 0.1 kilogram (Kg) using a portable balance scale. Body Mass Index (BMI; kg/m2) was calculated as weight (in kg) divided by the square of the height (in meters; m.)

Ethical Considerations

Patients were informed that their participation would not influence the type of care provided by the treatment team and were told there would be no direct benefit to them, although it was hoped that the knowledge gained might ultimately benefit other bariatric patients in the future. Patients were also informed that the findings would be shared with the treatment team only if they desired. Therefore, upon fulfillment of ethical requirements IRB approval from designated authorities was obtained.

Participants

Of 68 patients who underwent weight loss interventions in the mentioned study time, 40 have signed consent and only 38 completed the whole assessment at baseline and 6 month-follow up, 30 (%)of them were females. Mean age and mean BMI prior to surgery were 32±9.5Kg and 43.1±5.8kg/m2 respectively. Martial status, educational levels and baseline characteristics are resumed in table 1.

Assessment of Psychological Functions

The Beck depression inventory (BDI)

A widely used and established measure for assessment of current depression level and symptoms of depression; it consists of 21 questions with four possible answers to each question. A numeric value ranging from zero to three is assigned to each answer and the summation of scores of the 21 answers is used as tool for interpretation. Mood disorders, minor, moderate and major depression are scored 5 to 9, 10 to 18, 19 to 29 and 30 to 63 respectively (Beck et al, 1988).

The Rosenberg Self-Esteem Scale (RSES)

A 10-item well-established measure of global Self-esteem. Responses were rated on 4-point scale (strongly disagree to strongly agree) yielding scores from zero to 30 with higher scores indicating higher self-esteem; scores below 15 suggest low self-esteem (Rosenberg, 2015).

The Body Shape Questionnaire (BSQ)

A 34-item measure of body dissatisfaction assesses the frequency and preoccupation with and distress about body size and shape. Participants rate their answer on a scale from one (never) to six (always); higher scores reflect greater body dissatisfaction and alteration of the body image (Cooper et al, 1987).

SF-36 Health survey

Developed from the Medical Outcomes Study (MOS), is a 36-item questionnaire that evaluates health-related quality of life in eight domains: physical functioning, social functioning, mental health, vitality, bodily pain, functions limitations due to physical problems, functions limitation due to emotional problems and general health perception. Each domain is scored from zero (low functional level) to 100 (highest functional level) (Ware et al, 1992).

Preliminary Analyses

Baseline cross-sectional pre-interventional analysis was only conducted on the data collected from participants who have completed the whole study in order to be able to elicit the intervention effects on the body mass index from one side and on body image, self-esteem, depression and quality of life from another side. SPSS computerized Program was used for this aim.

Interventions Effects

BMI at 6 months post intervention was calculated and all psychosocial functioning variables were collected again using the same questionnaire-forms as in initial visit. Wilcoxon-Rank Sum Test was used in comparing pre and post intervention studied variables. The interventional effect was assessed by the correlation between pre- and post-interventional BMI from one side and the pre- and post-interventional changes of psychosocial functioning from the other side by the use of Stepwise Regression equation.

3. RESULTS

The study sample comprised of 38 patients where 30 (78.1%) of them were females while 8 (21.9%) of them were males. In addition, half of them were singles (50%), while only 4 participants (0.5%) were divorced. Twenty participants (52.6%) have acquired the university level degrees of education followed by 39.4% who attained high school education, while only two (5.3%) have post-graduate degrees and one (2.6%) have acquired a PhD. Moreover, the mean age of study completers was 32± 9.5, and all of them were having a body mass index greater than 40 kg/m2 (43.1±5.8 kg/m2). The most selected surgery method was gastric sleeve which constituted around two third (63.2%) of participants' selected methods, followed by gastric band with (18.4%) and the least adopted method was Bilio-Pancreatic Diversion was the least selected method (5.3%) (Tables 1 and 2).

Table 1: Sociodemographic Data

Gender	**N**	**%**
Women	30	78.1%
Men	8	21.9%
Marital status		
Married	15	39.5%
Single	19	50.0%
Divorced	4	0.5%
Education level		
High school	15	39.4%
University	20	52.6%
Postgraduate	2	5.3%
PhD	1	2.6%
Surgery method		
G. Band	7	(18.4%)
G. sleeve	24	(63.2%)
G. Balloon	5	(13.2%)
Bilio-Pancreatic Diversion/ Bypass	2	(5.3%)

Table 2: Sociodemographic Data

	M ± SD
Age (years)	32 ± 9.5
Mean BMI (kg/m^2)	
Before Intervention	43.1 ± 5.8
After Intervention	32.1 ± 3.9

A descriptive analysis was carried out to compare the patients' quality of life and psychological functioning parameters before and after the intervention. The results of the descriptive analysis show a positive shift after the intervention on the level of all the parameters except on the level of role limitation and body shape scale, where a negative shift has been recorded (Table 3).

Table 3: Descriptive analysis of study parameters

Rosenberg self-esteem scale (RSES)	**M ± SD**
Before Intervention	11.1 ± 1.2
After Intervention	19.3 ± 2.4
Beck's Depression Scale	
Before Intervention	23.3 ± 12.24
After Intervention	7.4 ± 3.76
The body shape Scale (BSQ)	
Before surgery	155.2± 13.6
After surgery	102.4± 9.1
General health (GH)	
Before Intervention	55.4 ± 12.6
After Intervention	75.3± 5.5
Emotional health problem	
Before Intervention	73.6± 32.1
After Intervention	86.84± 16.51
Physical function (PF)	
Before Intervention	42.2± 9.77
After Intervention	80.78± 5.87
Role limitation (RL)	
Before Intervention	79.6± 14.06
After Intervention	81.5± 12.57
Bodily pain (BP)	
Before Intervention	82.6± 17.90
After Intervention	92.1± 7.33
Social function (SF)	
Before Intervention	81.9± 17.36
After Intervention	89.4± 11.81
Mental health (MH)	
Before Intervention	46.4± 6.34
After Intervention	86.4± 8.08
Vitality energy	
Before Intervention	72.1 ± 7.7
After Intervention	78.0± 7.3

ANCOVA test was carried out to determine the interaction effect between changes in the BMI and quality of life and psychological functioning parameters. The results of this analysis showed that there was a positive interaction effect on various levels of the parameters where significant p-value was recorded on the level of Depression Scale (P=0.05), Body Shape Scale (P<0.00), General Health (P=0.00), Physical function (P=0.04), Mental health (P=0.03) and vitality (P=0.04) (Table 4).

Table 4: Interaction effect between BMI and quality of life and psychological parameters

	BMI (kg/m2)			**P-Value**
	30-35	**35-40**	**> 40**	
Depression				
None	0	0	0	
Mild	1(3.025%)	2(6.05%)	5(15.125%)	0.05
Moderate		6(18.2%)	6(18.2%)	
Severe	1(3.03%)		12(36.3%)	
Self-esteem				
Low	3(7.8%)	6(15.7%)	24(63.1%)	0.11
High		3(7.9%)	2(5.2%)	
Body Shape				
< 100	0	0	0	<0.0001
100-150	2(5.2%)	7(18.4%)	3(3%)	
> 150	1(2.6%)	2(5.2%)	23(60.5%)	
Quality of life				
General Health				
< Normal	3(7.8%)	9(23.7%)	22(57.9%)	0.00
Normal			4(10.5%)	
Emotional				
< Normal	2(5.2%)	5(13.16%)	11(28.97%)	0.62
Normal	1(2.6%)	4(10.52%)	15(39.45%)	
Physical function				
< Normal	3(7.89%)	9(23.68%)	26(68.43%)	0.04
Normal	0	0	0	
Role limitation				
< Normal	2(5.26%)	8(21.05%)	18(47.37%)	0.49
Normal	1(2.63%)	1(2.63%)	8(21.04%)	
Bodily pain				
< Normal		2(5.2%)	6(15.8%)	0.64
Normal	3(7.89%)	7(18.41%)	20(52.6%)	
Social functioning				
< Normal	2(5.2%)	4(10.5%)	11(28.9%)	0.72
Normal	1(2.6%)	5(13.17%)	15(39.5%)	
Mental health				
< Normal	3(7.89%)	9(23.68%)	26(68.43%)	0.03
Normal	0	0	0	
Vitality				
< Normal	3(7.89%)	9(23.68%)	26(68.43%)	0.04
Normal	0	0	0	

BMI at 6 months post intervention was calculated and all psychosocial functioning variables were collected again using the same questionnaire-forms as in initial visit. Wilcoxon-Rank Sum Test was used in comparing pre and post intervention studied variables. The interventional effect was assessed by the correlation between pre- and post-interventional BMI from one side and the pre- and post-interventional changes of psychosocial functioning from the other side by the use of Stepwise Regression equation. The results show that there was a significant interventional effect on the level of all study parameter where a p-value of $P<0.05$ was recorded (Table 5).

Table 5: Difference in BMI and psychosocial parameters pre and post-intervention

	Pre	Post	P-Value
BMI			
25-30	0 (0%)	13 (34.2%)	
30-35	3 (7.9%)	17 (44.7%)	0.00
35-40	9 (23.7%)	6 (15.8%)	
>40	26 (68.4%)	2 (5.3%)	
RSES			
Low	33 (86.8%)	1 (2.6%)	< 0.0001
High	5 (5 (13.2%)	37 (97.4%)	
BDI			
(5-9)	0 (0%)	20 (52.6%)	
Mild (10-18)	8 (21.1%)	9 (23.7%)	< 0.0001
Moderate (19-29)	12 (31.6%)	1 (2.6%)	
Severe (30-63)	13 (34.2%)	0 (0%)	
BSQ			
< 100	0 (0%)	16 (42.1%)	< 0.0001
100-150	12 (31.6%)	22 (42.1%)	
> 150	26 (68.4%)	0 (0%)	
SF1			
< Normal	31 (81.6%)	2 (5.3%)	< 0.0001
Normal	7 (18.14%)	36 (94.7%)	
SF2			
< Normal	18 (47.7%)	15 (39.5%)	0.08
Normal	20 (52.6%)	23 (60.5%)	
SF3			
< Normal	38 (100%)	25 (65.8%)	< 0.0001
Normal	0 (0%)	13 (34.2%)	
SF4			
< Normal	28 (73.7%)	27 (71.1%)	0.31
Normal	10 (26.3%)	11 (28.9%)	
SF5			
< Normal	8 (21.1%)	0 (0%)	0.00
Normal	30 (78.9%)	38 (100%)	
SF6			
< Normal	17 (44.7%)	9 (23.7%)	0.00
Normal	21 (55.3%)	29 (76.3%)	
SF7			
< Normal	1 (2.6%)	0 (0%)	< 0.0001
Normal	37 (97.4%)	38 (100%)	
SF8			
< Normal	38 (100%)	1 (2.6%)	< 0.0001
Normal	0 (0%)	37 (97.4%)	

4. DISCUSSION

The results of our study showed that the patient candidates for bariatric surgery reported low physical function upon responding to the SF-36 Health Survey prior to surgery. This can be explained by the notion that usually patients who are morbidly obese have multiple comorbidities (De Luca at al., 2016, Herpertz et al., 2015, Hachem & Brennan 2016). The findings of this study also showed that the patients reported high depression scores before the intervention, which is also in line with previous research (Duarte et al., 2015; Dawes et al., 2016). There is broad opinion on clinical depression that this should not in itself be a disqualifying characteristic for surgery, but rather specific consideration and postoperative support should be provided to surgical candidates with psychological conditions (De Luca at al., 2016; Marcus et al., 2009; Müller et al., 2013).

Quality of life is a primary consequence of bariatric operation. The strong reverse association between mental quality of life and depression may indicate a redundant evaluation of both (De Luca at al., 2016). Previous studies has shown, nevertheless, that while depression influences subjective well-being, some quality of life dimensions (e.g. role functioning, social functioning) differ independently (Bullinger & Quitmann, 2014). The findings of this study also showed a significant improvement in the physical and mental quality of life as well as various functioning domains after the surgery, which is in line with previous research, which attributed this to the enhanced medical conditions as results of losing the excess weight, and subsiding comorbidities as an effect (Livhits et al., 2012).

In addition, multiple studies showed that there is an enhancement in the psychological status of the patients following bariatric surgery, and substantial improvement after a year of the procedure. This comes in support of our research findings as well as in line with previous studies which both real an improvement in self-esteem, body image, sexual and social functioning, and a decline in depressive and anxious symptoms following bariatric surgery (Stolzenberger et al., 2013). Some reports have suggested that patients with depression should be granted preference for bariatric surgery (Lier et al., 2011) because the findings of this research revealed that patients reported a substantial reduction in depression ratings postoperatively. This is compatible with previous studies that indicated that post-surgical weight reduction was correlated with a decline in depressive symptoms after surgery (Mensink et al., 2013). The results of this study showed that mental health was positively affected more than physical health, while role limitation, bodily pain, social functioning and emotional heath were not significantly affect by the changing BMI. This was in line with previous European data where patients report that weight affected physical function more than self-esteem (de Zwaan et al., 2011, Liebherz & Rabung, 2013). Moreover, our results our compatible with previous research which also showed shown a decrease in psychopathology and bettering of quality of life (Aasprang et al., 2013). A limitation of the study would be the small sample size, therefore further studies with wider samples are recommended.

5. CONCLUSION

A- In conclusion, this study shows that the weight change that has been brought about by the bariatric intervention had a significant positive influence on depression, self-esteem, body shape conception and health-related quality of life among Lebanese obese patients.

B- The researchers suggest carrying out a qualitative study that complements this study which would provide a more profound picture regarding the psychological experiences of patients post-bariatric surgery.

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