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Prevalence of depression among bariatric surgery patients in King Abdulaziz Medical city, Saudi Arabia

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Abstract
Introduction: Obesity considered as one of the common causes of multiple problems and increasing mortality worldwide. It is also considered as a main factor related to psychological problems, mainly depression and anxiety.
Aim: In this study, we aimed to assess the prevalence of psychological problems among post bariatric surgery patients in Saudi Arabia.
Methods: A descriptive cross-sectional study was conducted in King Abdulaziz Medical City in Riyadh, Jeddah and Dammam. A convenience sampling technique was used. Data was collected using a well-developed questionnaire and distributed in bariatric surgery clinics and filled by post-bariatric surgery patients,
Results: This study showed that 47.4% of the respondents were depressed, or hopeless several days, while 8.4% feeling depressed, or hopeless nearly every day, 40.6% of the respondents suffer from trouble falling or staying asleep or sleeping too much for several days and 12% of them suffer from trouble at sleeping nearly every day, 35.6% of the respondents of the study feeling tired and little energy for several days, 16.2% feeling that nearly every day. It also found that the prevalence of psychological problems, mainly depression among post bariatric surgery patients was 23%.
Conclusion: This study showed significant increase in the occurrence of post bariatric surgery psychological problems such as anxiety and depression among respondents, so we strongly recommend pre- and postoperative psychiatric assessment for all Bariatric surgery patients in clinics.

Keywords: obesity, psychological problems, post bariatric surgery, Saudi Arabia

Introduction

Obesity is a disease of epidemic proportions, representing a major public health problem [1]. According to the World Health Organization, there are at least 300 million obese people in world [2]. Its prevalence has increased alarmingly, leading more and more people to seek bariatric surgery (BS) as a treatment option due to the difficulty in obtaining good results in clinical treatments for weight reduction [3].

Obesity is classified by the calculation of body mass index (BMI), which represents ratio between the weight and the square height of the individual, and obesity is defined when the patient has a BMI > 30 kg/m2. Currently, BS is indicated for patients with BMI > 40Kg/m2 or above 35Kg/m2 relevant with life-threatening comorbidities [4]. Many patients show improvement or even cure of the comorbidities associated with obesity after surgery [3]. Typically, BS improves quality of life benefit, reducing the psychiatric symptoms, improving social relationship, self-esteem and even the financial condition of the patient [5].

There are no specific criteria for psychiatric evaluation of conducting for BS. There are no accurate data adequately studied and / or proven on the impacts of BS on the psychological behavior of patients [6]. Thus, as the number of patients undergoing BS increases, so does the need to understand how psychiatric symptoms may influence the results of the operation [7].

Approaches to the treatment of obesity remain challenging as the percentage of severely obese individuals continues to increase [8]. Practitioners are confronted with various options for weight loss but only surgical treatments currently offer long-term success for the severely obese (9). In a review of the possible surgical options, the long-term efficacy and impact on the individual's quality of life require evaluation. There is few information in the literature related to the most available surgical operations and their impacts on health-related quality of life (HRQoL) and depressed status. When weight reduced treatments were primarily restricted to introducing dietary options, medications and behavioral and life style modifications, modest long-term changes in body weight were applauded and these limited improvements in weight status continue to be validated for their positive impact on the medical comorbidities [10].

In the 10-year follow-up of the Swedish Obesity Study (SOS) observations of HRQoL seemed to follow the changes in weight loss, weight maintenance and weight regain [11]. After one year, improvements were greatest and the deterioration in HRQoL occurred with gain weight. With a 10% sustained weight loss positive long-term effects were noted in HRQoL. Only 4% of patients who were surgically operated had a gastric bypass and these patients completed the study with a maintained body weight loss of 25.1%. As surgical procedures are continually evolving, the results of weight loss and its maintenance are continually improving [9]. A more recent study of gastric bypass patients, Kolotkin et al [12] established that positive changes in HRQoL were maintained for a 6-year duration. Comparisons of surgical impacts are problematic as researchers conduct different weight loss surgical operations and elect to use different HRQoL tools for their assessments. Even with these confounding factors, severely

obese patients consistently report marked improvement in mood state and HRQoL after surgery [13]. Whether or not HRQoL and depressive symptoms after weight loss surgery directly relate to the amount of weight loss remains an unanswered question, as current published studies have had inconsistent results [14].

Several studies has shown that the best modality of treatment for morbid obesity is bariatric surgery [15, 16], which has been proven to be effective in controlling weight, thereby, increasing the survival rate and remarkably decreasing the overall mortality [17]. However, the outcome of bariatric surgery on psychological health, depression and anxiety varies between individuals. The most common psychiatric diseases among bariatric surgery candidates are anxiety disorders, mood disorders, and binge eating disorder (BED), and personality disorders [18, 19].

As is well known, weight regain after BS can occur and therefore all efforts must be made in order to prevent such occurrence. Several factors can explain this, each of which has high inter-individual variability [20, 21]. In most current literature, improved long-term depression outcomes among BS patients have been shown, although some studies have not demonstrated improvement and others have revealed worsening [22, 23]. However, little is known about the impact that the diagnosis of depression before bariatric surgery (DDBS) may have on weight loss. With this work, we aimed to evaluate the impact of DDBS on weight loss 3 years after BS.

Based on a study published in US, the most common mental health conditions among patients who are seeking or undergoing bariatric surgery, are depression 19% and binge eating disorder 17% both estimates are higher than published rates for the general United States population [24]

Another study was conducted in Canada which showed that patients who have undergone bariatric surgery may have a higher chance of depression, anxiety and other psychiatric illnesses compared to other obese individuals with similar preoperative characteristics. [25]. A recent local cross-sectional study among 200 bariatric patients was done at King Abdulaziz University Hospital (KAUH), Jeddah which showed that post bariatric surgery prevalence of anxiety and depression is high in comparison to the general population. [26], as noticed from literature review and based upon our clinical observation that the incidence of depression is increased within the first-year post operatively.

As Studies addressing psychological impacts among bariatric patients in Saudi Arabia are limited. More studies are needed to assess depression prevalence among those patients. To help the medical team maximize the mental health support after surgery and to promote establishing a well-organized program for pre & post-operative assessment and counseling.

Materials and Methods

Study Design

This descriptive cross-sectional study was conducted to assess the prevalence of depression among post bariatric surgery patients in Saudi Arabia.

Study Area

This study was conducted in King Abdulaziz Medical City in Riyadh, Jeddah and Dammam.

The questionnaires were distributed in bariatric surgery clinics to post-bariatric surgery patients specifically after their participation approval, and data were collected by the data collectors. The data collection in the other regions (Jeddah & Riyadh) included medical students and interns who were willing to participate & their names were in the acknowledgement only.

Sampling technique and sample size

In this study, we used convenience sampling technique, due to the difficulty to generate sampling frame, so available subjects who fulfilled inclusion criteria were selected. By using 95% confidence interval (CI) and 5% margin of error, and a design effect of 1.5, the acquired sample size was 272, but we already selected 350 patients to increase the accuracy of the study.

Data collection tools

Data was collected using a well-developed questionnaire, the questionnaire contained three sections; 1st section covered questions about demographic and personal characteristics. 2nd section consisted of questions about Preoperative conditions like previous psychiatric illness, or major medical problems and BMI; while 3rd section covered questions to assess depression using Patient health questionnaire (PHQ9) [42].

Inclusion criteria

All post bariatric surgery patients, who did their surgery in the previous 1-12months and agree to participate in this study, were selected.

Exclusion criteria

Ages less than 20 years of patients who did bariatric surgery more than 12 months ago, patient with psychiatric disorders and who had history of major medical problems or patient who disagree to participate in this study, were excluded.

Statistical Analysis

Collected data was analyzed using statistical package for IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp, where descriptive statistics such as frequencies and percentage were conducted for categorical variables, while mean and standard deviation (SD) were for describing the continuous variables. Analytic statistics such as chi-square test, independent -t test, and ANOVA where applicable was used. Statistical significance is set to be 0.05 or less.

Ethical Considerations

This study was approved from the IRB of King Abdullah International Medical Research Center in 01/06/2020, under the number; RYD-20-419812-7819. In addition, all ethical issues were considered during the process of this study and respondents were signed informed consent and informed about the aims of the study, confidentiality of collected information and possibility of withdrawing from the study at any time.

Results

The results are presented in parts

Part one: Demographic characteristics of the respondents

Part two: Psychological problems among post-bariatric surgery patients

Part three: Relationship between psychological problems among post-bariatric surgery patients and selected

demographic characteristics using Chi square test.

Part one: Demographic characteristics of the respondents

Table 1: Frequency distribution of socio-demographic Data of respondents

Variable	choices	Frequency	Percent
City	Jeddah (NGH)	163	32.6%
	East (NGH)	100	20.0%
	Riyadh (NGH)	***237***	47.4%
Sex	Female	350	70.0%
	Male	150	30.0%
Age	Less than 20 Years	39	7.8%
	From 21-30 Years	165	33.0%
	From 31-40 Years	179	35.8%
	From 41-50 Years	96	19.2%
	More than 50 years	21	4.2%
Educational Level	Illiterate	14	2.8%
	Elementary school	19	3.8%
	Middle school	33	6.6%
	High school	113	22.6%
	University	285	57.0%
	Higher studies	36	7.2%
Employee	Employee	242	48.4%
	Unemployed	258	51.6%
Do you have any chronic diseases?	Yes	74	14.8%
	No	426	85.2%
Do you have history of Psychiatric illnesses?	Yes	114	22.8%
	No	386	77.2%
Pre- operative BMI	Less than 25	11	2.2%
	26-30	48	9.6%
	31-35	119	23.8%
	36-40	132	26.4%
	41-50	119	23.8%
	More than 50	71	14.2%
When did you do bariatric surgery	less than a month	40	8.0%
	1-3 months	62	12.4%
	4-6 months	88	17.6%
	6 months - a year	82	16.4%
	1 year - 2 years	112	22.4%
	More than two years	116	23.2%

Table (1) shows that about half of the sample (47.4%) resident in Riyadh, majority of them were females (70.0%), more than half of the sample (57.0%) their educational level is university level, almost half (51.6%) of the sample were unemployed, majority of the sample (85.2%) have not any chronic diseases, more than three quarters of the sample (77.2%) have not any history of psychiatric illnesses, about 26.4% of the sample had pre- operative BMI ranged between 36-40 and about of the 23.2% of sample did bariatric surgery more than two years.

Part two: After the operation of the Sample

Table 2: Frequency distribution of Psychological problems among post-bariatric surgery patients

Variable	choices	Not at all	Several days	More than half of the days	Nearly every day	Mean	Std. Deviation
Little interest or pleasure in doing things?	Number	196	178	82	44	0.948	0.952
	percent	39.2%	35.6%	16.4%	8.8%		
Feeling down, depressed, or hopeless?	Number	133	237	88	42	1.078	0.879
	percent	26.6%	47.4%	17.6%	8.4%		
Trouble falling or staying asleep, or sleeping too much?	Number	139	203	98	60	1.158	0.965
	percent	27.8%	40.6%	19.6%	12.0%		
Feeling tired or having little energy?	Number	111	178	130	81	1.362	1.000
	percent	22.2%	35.6%	26.0%	16.2%		
Poor appetite or overeating?	Number	180	167	107	46	1.038	0.971
	percent	36.0%	33.4%	21.4%	9.2%		
Feeling bad about yourself or that you are a failure or have let yourself or your family down?	Number	241	151	75	33	0.800	0.926
	percent	48.2%	30.2%	15.0%	6.6%		
Trouble concentrating on things, such as reading the newspaper or watching television?	Number	220	155	79	46	0.902	0.979
	percent	44.0%	31.0%	15.8%	9.2%		
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	Number	268	147	57	28	0.690	0.883
	percent	53.6%	29.4%	11.4%	5.6%		

Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	Number	294	136	50	20	0.592	0.826
	percent	58.8%	27.2%	10.0%	4.0%		
The overall prevalence of psychological disorders after operation		40%	34%	17%	8%		
The overall prevalence of psychological disorders after operation		23%					

Table 2 showed that the frequency distribution of assessment of perception of the sample; Where more than one third of the sample (39.2%) were little interest or pleasure in doing things several days, about (47.4%) of the sample feeling down, depressed, or hopeless several days, about (40.6%) of the sample had trouble falling or staying asleep, or sleeping too much several days, more than one third of the sample (35.6%) feeling tired or having little energy several days, about (33.0%) had poor appetite or overeating not at all, about half of sample, about (30.0%) feeling bad about their self or were a failure or have let their self or their family down not at all, about (31.0%) had trouble concentrating on things such as reading the newspaper or watching television, about half of the sample (29.0%) were moving or speaking so slowly than other people could have noticed, or so fidgety or restless than that they have been moving a lot more than usual not at all and finally about (27.0%) thoughts that they would be better off dead, or thoughts of hurting their self in some way. The overall prevalence of psychological disorders after operation was 23%.

Part three: Relationship between psychological problems among post-bariatric surgery patients and selected demographic characteristics.

Part four: Difference between problems after the operation and selected demographic characteristics of the sample

Part three: Relationship between psychological problems among post-bariatric surgery patients and selected demographic characteristics using Chi square test

Table 3: Relationship between psychological problems and City

Items	Chi-	P
Little interest or pleasure in doing things?	17.879	0.007
Feeling down, depressed, or hopeless?	15.454	0.017
Trouble falling or staying asleep, or sleeping too much?	16.212	0.013
Feeling tired or having little energy?	20.439	0.002
Poor appetite or overeating?	22.384	0.001
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	17.019	0.009
Trouble concentrating on things, such as reading the newspaper or watching television?	17.944	0.006
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	8.491	0.204
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	12.668	0.049

Table ***3.1*** showed that there was statistically significant relationship between city categories and all item for problems after the operation, except Moving or speaking so slowly that other people could have noticed p-value < 0.05.

Table 4: Relationship between psychological problems and Sex

Items	Chi-	P
Little interest or pleasure in doing things?	2.061	0.560
Feeling down, depressed, or hopeless?	5.798	0.122
Trouble falling or staying asleep, or sleeping too much?	3.907	0.272
Feeling tired or having little energy?	3.061	0.382
Poor appetite or overeating?	0.381	0.944
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	7.956	0.047
Trouble concentrating on things, such as reading the newspaper or watching television?	0.269	0.966
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	5.717	0.126
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	3.869	0.276

Table 3.2 showed there was no statistically significant relationship between sex and most of item for problems after the operation (p-value > 0.05), but there was statistically significant relationship between sex and feeling bad about yourself — or that you are a failure or have let yourself or your family down p-value < 0.05.

Table 5: Relationship between psychological problems and age

Items	Chi-	P
Little interest or pleasure in doing things?	13.216	0.354
Feeling down, depressed, or hopeless?	17.468	0.133
Trouble falling or staying asleep, or sleeping too much?	21.465	0.044
Feeling tired or having little energy?	13.173	0.357
Poor appetite or overeating?	26.459	0.009
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	22.852	0.029

Trouble concentrating on things, such as reading the newspaper or watching television?	7.648	0.812
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	14.444	0.273
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	8.661	0.732

Table 3.3 Showed that there was statistically significant relationship between trouble falling, staying asleep, sleeping too much, poor appetite or overeating, feeling bad about yourself — or that you are a failure or have let yourself or your family down and age, p value < 0.05.

Table 6: Relationship between psychological problems and educational level

Items	Chi-	P
Little interest or pleasure in doing things?	22.649	0.092
Feeling down, depressed, or hopeless?	11.970	0.681
Trouble falling or staying asleep, or sleeping too much?	22.507	0.095
Feeling tired or having little energy?	16.498	0.350
Poor appetite or overeating?	22.082	0.106
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	34.803	0.003
Trouble concentrating on things, such as reading the newspaper or watching television?	33.723	0.004
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	39.242	0.001
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	32.786	0.005

Table 3.4 showed that there was statistically significant relationship between feeling bad about yourself, a failure, let yourself or your family down and educational level (p=0.003), between trouble concentrating on things, such as reading the newspaper or watching television, between moving or speaking so slowly that other people could have noticed, or so fidgety or restless that you have been moving a lot more than usual, thoughts that you would be better off dead, or thoughts of hurting yourself in some way p value < 0.05.

Table 7: Relationship between psychological problems and employee

Items	Chi-	P
Little interest or pleasure in doing things?	8.660	0.034
Feeling down, depressed, or hopeless?	2.727	0.436
Trouble falling or staying asleep, or sleeping too much?	0.784	0.853
Feeling tired or having little energy?	7.674	0.053
Poor appetite or overeating?	10.604	0.014
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	0.787	0.853
Trouble concentrating on things, such as reading the newspaper or watching television?	9.614	0.022
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	8.997	0.029
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	5.474	0.140

Table 3.5 showed that there was statistically significant relationship between employee and little interest or pleasure in doing things, between employee and poor appetite or overeating, between employee and trouble concentrating on things, such as reading the newspaper or watching television, between employee and moving or speaking so slowly that other people could have noticed or so fidgety or restless that you have been moving a lot more than usual p value < 0.05.

Table 8: Relationship between psychological problems and chronic diseases

Items	Chi-	P
Little interest or pleasure in doing things?	10.729	0.013
Feeling down, depressed, or hopeless?	1.982	0.576
Trouble falling or staying asleep, or sleeping too much?	8.233	0.041
Feeling tired or having little energy?	5.992	0.112
Poor appetite or overeating?	2.389	0.496
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	5.125	0.163
Trouble concentrating on things, such as reading the newspaper or watching television?	3.718	0.294
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	0.661	0.882
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	5.597	0.133

Table 3.6 showed that there was statistically significant relationship between having any chronic diseases, little interest or pleasure in doing things and trouble falling or staying asleep, or sleeping too much (p value < 0.05).

Table 9: Relationship between psychological problems and history of psychiatric illnesses

Items	Chi-	P
Little interest or pleasure in doing things?	9.349	0.025
Feeling down, depressed, or hopeless?	4.395	0.222
Trouble falling or staying asleep, or sleeping too much?	2.577	0.461
Feeling tired or having little energy?	4.938	0.176
Poor appetite or overeating?	2.161	0.540
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	3.453	0.327
Trouble concentrating on things, such as reading the newspaper or watching television?	0.981	0.806
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	5.480	0.140
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	6.752	0.080

Table 3.7 showed that there was statistically significant relationship between problems after the operation and do you have history of psychiatric illnesses and little interest or pleasure in doing things p value < 0.05.

Table 10: Relationship between psychological problems and BMI

Items	Chi-	P
Little interest or pleasure in doing things?	23.395	0.076
Feeling down, depressed, or hopeless?	24.221	0.061
Trouble falling or staying asleep, or sleeping too much?	19.795	0.180
Feeling tired or having little energy?	20.741	0.145
Poor appetite or overeating?	27.338	0.026
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	26.315	0.035
Trouble concentrating on things, such as reading the newspaper or watching television?	20.570	0.151
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	24.234	0.061
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	13.622	0.554

Table 3.8 showed that there was statistically significant relationship between BMI and poor appetite or overeating, and between BMI and feeling bad about yourself — or that you are a failure or have let yourself or your family down, p value < 0.05.

Table 11: Relationship between psychological problems and when did you do bariatric surgery

Items	Chi-	P
Little interest or pleasure in doing things?	25.392	0.045
Feeling down, depressed, or hopeless?	26.366	0.034
Trouble falling or staying asleep, or sleeping too much?	28.079	0.021
Feeling tired or having little energy?	25.730	0.041
Poor appetite or overeating?	24.307	0.030
Feeling bad about yourself — or that you are a failure or have let yourself or your family down?	43.850	0.000
Trouble concentrating on things, such as reading the newspaper or watching television?	25.343	0.046
Moving or speaking so slowly that other people could have noticed? Or so fidgety or restless that you have been moving a lot more than usual?	37.755	0.001
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	33.257	0.004

Table 3.9 showed that there was statistically significant relationship between when did you do bariatric surgery and All mentioned variables in this table, p value < 0.05.

Table 12: Severity of depression

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	all not at all	12	2.4	2.4	2.4
	Minimal depression	104	20.8	20.8	23.2
	Mild depression	195	39.0	39.0	62.2
	Moderate depression	124	24.8	24.8	87.0
	Moderately severe depression	45	9.0	9.0	96.0
	Severe depression	20	4.0	4.0	100.0
	Total	500	100.0	100.0	

Only 2% who had not any symptoms of depression, 21% had minimal depression, 39% had mild depression, 25% had Moderate depression, 9% had moderately severe depression, while only 4% had severe depression.

Table 13: Relationship between severity of depression and when did you do bariatric surgery

		When did you do bariatric surgery						Total	P Value
		less than a month	1-3 months	4-6 months	6 months - a year	1 year - 2 years	More than two years		
all not at all	Count	0	1	5	1	3	2	12	0.000
	% within PHQ_9	.0%	8.3%	41.7%	8.3%	25.0%	16.7%	100.0%	
	% within When did you do bariatric surgery	.0%	1.6%	5.7%	1.2%	2.7%	1.7%	2.4%	
	% of Total	.0%	.2%	1.0%	.2%	.6%	.4%	2.4%	
Minimal depression	Count	10	16	13	24	28	13	104	
	% within PHQ_9	9.6%	15.4%	12.5%	23.1%	26.9%	12.5%	100.0%	
	% within When did you do bariatric surgery	25.0%	25.8%	14.8%	29.3%	25.0%	11.2%	20.8%	
	% of Total	2.0%	3.2%	2.6%	4.8%	5.6%	2.6%	20.8%	
Mild depression	Count	21	22	24	40	40	48	195	
	% within PHQ_9	10.8%	11.3%	12.3%	20.5%	20.5%	24.6%	100.0%	
	% within When did you do bariatric surgery	52.5%	35.5%	27.3%	48.8%	35.7%	41.4%	39.0%	
	% of Total	4.2%	4.4%	4.8%	8.0%	8.0%	9.6%	39.0%	
Moderate depression	Count	7	12	37	11	27	30	124	
	% within PHQ_9	5.6%	9.7%	29.8%	8.9%	21.8%	24.2%	100.0%	
	% within When did you do bariatric surgery	17.5%	19.4%	42.0%	13.4%	24.1%	25.9%	24.8%	
	% of Total	1.4%	2.4%	7.4%	2.2%	5.4%	6.0%	24.8%	
Moderately severe depression	Count	2	9	9	4	9	12	45	
	% within PHQ_9	4.4%	20.0%	20.0%	8.9%	20.0%	26.7%	100.0%	
	% within When did you do bariatric surgery	5.0%	14.5%	10.2%	4.9%	8.0%	10.3%	9.0%	
	% of Total	.4%	1.8%	1.8%	.8%	1.8%	2.4%	9.0%	
Severe depression	Count	0	2	0	2	5	11	20	
	% within PHQ_9	.0%	10.0%	.0%	10.0%	25.0%	55.0%	100.0%	
	% within When did you do bariatric surgery	.0%	3.2%	.0%	2.4%	4.5%	9.5%	4.0%	
	% of Total	.0%	.4%	.0%	.4%	1.0%	2.2%	4.0%	

There was statistically significant association between Severity of depression and when did you do bariatric surgery, P value < 0.05

Discussion

Obesity considered as one of the common causes of multiple problems and increasing mortality worldwide (27, 28). It is also considered as a main factor related to psychological problems, mainly depression and anxiety (29). In this study, we aimed to assess the prevalence of psychological problems among post bariatric surgery patients in Saudi Arabia.

The current study showed that the frequency distribution of assessment of perception of the sample; Where more than one third of the sample (39.2%) were little interest or pleasure in doing things several days, about (47.4%) of the sample feeling down, depressed, or hopeless several days, about (40.6%) of the sample had trouble falling or staying asleep, or sleeping too much several days, more than one third of the sample (35.6%) feeling tired or having little energy several days, about (33.0%) had poor appetite or overeating not at all, about half of sample, about (30.0%) feeling bad about themselves or were a failure or have let their self or their family down not at all, about (31.0%) had trouble concentrating on things such as reading the newspaper or watching television, about half of the sample (29.0%) were moving or speaking so slowly than other people could have noticed, or so fidgety or restless than that they have been moving a lot more than usual not at all and finally about (27.0%) thoughts that they would be better off dead, or thoughts of hurting their self in some way.

Our study also indicated that the prevalence of psychological problems, mainly depression among post bariatric surgery patients was 23%, which was less than recent study conducted in 2019 (30) and showed the prevalence of psychological problems among post bariatric surgery patients as 31%, another study conducted in United States, showed that 32% of the candidates had depression in the second year post-operatively (31). Comparing our findings to previous study conducted in Saudi Arabia showed a much higher prevalence of psychological problems among post bariatric surgery patients (32). Another study showed that the lifetime prevalence of depression in Canada was 8.3% and the United States was 16.9% (33). All of these percentages are still lower than the prevalence of depression observed in our study. On the other hand, a study that compared the preoperative and postoperative depression rates found that depression decreased postoperatively with no significant difference [34].

Obesity is the most common preventable chronic disease in community, as its prevalence has increased dramatically. However, many studies indicated that almost 20% of patients fail to lose significant amount of weight after the operation and this event is often attributed to psychological problems and not necessarily to operative technical problems [35, 36]. Thus, it is important to study the changes of behavior that this operation can create on patients [37, 38].

This study also showed that only 2% who had not any symptoms of depression, 21% had minimal depression, 39% had mild depression, 25% had moderate depression, 9% had moderately severe depression, while only 4% had Severe depression. It also found that there was statistically

significant association between Severity of depression and when did you do bariatric surgery, P value < 0.05. Many similar studies showed that patients undergoing bariatric surgery have higher levels of depression than other obese patients with similar BMI and of the same age and sex [39, 40, 41].

Conclusion

The results of our study have shown that the post bariatric surgery psychological problems mainly depression is high comparing to previous study conducted in Saudi Arabia, therefore, we strongly recommend pre- and postoperative psychiatric assessment for all bariatric surgery patients in clinics. The implementation of such screening might help control these problems as well as improve the postoperative outcomes of bariatric surgery.

Declarations

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Conflict of interest
None declared

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