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Mental health status as a predictor of emergency department visits and hospital readmissions post bariatric surgery: a retrospective cohort study

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Abstract

Background This retrospective cohort study aims to investigate emergency department (ED) visits and readmission after bariatric surgery among patients with a history of anxiety and/or depression. We predict that patients with a reported history of anxiety and/or depression will have more ED visits in the year following surgery than patients without a history of mental illness.

Methods Data were collected from the charts of all consecutive patients who underwent sleeve gastrectomy or gastric bypass surgery between March 2012 and December 2019. Data on baseline body mass index, mental health diagnosis and treatment and emergency department visits and hospital readmissions were retrospectively reviewed over the first year following surgery.

Results One thousand two hundred ninety-seven patients were originally included in this study and 1113 patients were included in the final analysis. Patients with a history of depression (OR 1.23; 95% CI 0.87–1.73), anxiety (OR 1.14; 95% CI 0.81–1.60), or both (OR 1.17; 95% CI 0.83–1.65) did not have a statistically significant increase in ED visits compared to patients without these disorders. Patients with a history of depression (OR 1.49; 95% CI 0.86–2.61), anxiety (OR 1.45; 95% CI 0.80–2.65) or both (OR 1.47; 95% CI 0.94–2.29) did not have a statistically significant increase in hospital readmissions in the first year after surgery compared to patients without these disorders. Patients treated with a sleeve gastrectomy were readmitted due to postoperative complications less frequently than those treated with other surgeries (OR 0.20; 95% CI 0.05–0.83).

Conclusion Patients with a history of anxiety, depression or both did not have an increased rate of emergency department visits and hospital readmissions within the first year following bariatric surgery. This contradicts current literature and may be due to the multidisciplinary program patients undergo at this study's home institution.

Keywords Bariatric surgery · Mental health · Emergency department visits

Mental illness is highly prevalent among bariatric surgery patients, with estimates ranging from 23 to 68% of patients affected preoperatively [1, 2]. Despite recommendations from The American Society for Metabolic and Bariatric Surgery (ASMBS) regarding the assessment of psychosocial functioning before bariatric surgery [3], the literature is mixed on the timing of psychiatric concerns before and after surgery, making it difficult for clinicians to evaluate risk effectively [4]. Opinions vary regarding whether such patients are good candidates for bariatric surgery [5–7], reflecting uncertainty about their long-term weight loss and risk of complications [8]. Literature suggests an increase in emergency department (ED) visits following bariatric surgery in patients diagnosed with bipolar disorder and schizophrenia. However, this does not represent increased ED visits related to bariatric surgery complications or

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concerns about their psychiatric illness [9]. This suggests there are other factors at play influencing the rates of emergency department visits post-bariatric surgery. We aim to understand if the same phenomenon happens in patients with anxiety and/or depression at our institution who undergo a robust multidisciplinary program before undergoing weight loss surgery. Accordingly, the current study examined medical- and psychiatric-related ED encounters and hospital readmissions following bariatric surgery. We predict that patients with a reported history of anxiety and/or depression will have more ED visits and higher hospital readmissions in the year following surgery than patients without a history of mental illness.

Materials and methods

Study approval for this retrospective cohort was obtained from the University of South Florida Institutional Review Board (STUDY004029). Patient consent was deemed unnecessary by the Institutional Review Board (IRB) due to its retrospective nature. Standard protocol at the institution's bariatric center of excellence includes weekly meetings between bariatric surgeons and the in-center team of psychologists to discuss patient readiness for surgery. This program allows psychologists to assess and treat illness, while at the same time deeming patients mentally unfit for surgery if they have any concerns.

After IRB approval, the electronic medical records of our bariatric center were assessed to identify all emergency visits for all consecutive patients who had undergone bariatric surgery from March 2007 through December 2019. Patients were included if they had undergone a sleeve gastrectomy or gastric bypass procedure during this period. Data regarding anxiety, depression, patient demographics, ED encounter details (e.g., dates and reason for ED encounter), hospital readmission, etc. were abstracted from the patient charts. The incidence of postoperative complications, such as nausea and/or vomiting and incisional or intraabdominal infection, was also investigated as a secondary outcome of the study. Treatment collected for mental health disorders included pharmacologic intervention and/or psychotherapy. Potential confounding variables that were taken into consideration and thus also collected from patient charts were comorbidities, such as hypertension, diabetes mellitus, obstructive sleep apnea and hypothyroidism. The statistical model also adjusted for surgery type, as complications after laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass may differ. Adjusting for this in the model helped prevent surgery type becoming a confounding variable in our comparison of ED visits and readmissions between patients with and without anxiety and/or depression. Any differences in outcomes found between sleeve gastrectomy and Roux-en-Y gastric bypass were secondary findings and are not the main discussion of this study.

Statistical analysis

We conducted the descriptive analysis to report frequencies for categorical data and mean and standard deviation (SD) or median and range for continuous data. We used the chi-square or Fisher's exact test to investigate the association between categorical variables. We reviewed the difference in the distribution of continuous variables across categorical variables using the Mann–Whitney *U* test. We conducted a multivariate logistic regression analysis to explore variables associated with ED visits and hospital readmissions to report odds ratio (OR) and 95% confidence intervals (95% CIs). All analyses were conducted by SPSS version 26 software. *P* values less than 0.05 denoted statistical significance. Statistical expertise was available to the authors, and statistics were performed by the fifth author (RM) of this paper.

Results

There were 1297 patients included in this study. One thousand fifty-five patients studied were female and patients had an average age of 44 years old ± 12.28 years. Eight hundred patients identified as White, 239 identified as Black, 241 identified as Hispanic and 17 patients belonged to other racial groups. At the time of surgery, 240 patients were single, 684 were married, 152 were with an unmarried partner, 179 had been divorced, and 38 were widowed. The average baseline BMI among patients studied was 47.29 ± 8.76 kg/m^2. Comorbidities collected included diabetes mellitus (type one or two), hypertension, obstructive sleep apnea, and hypothyroidism. 34.3% of patients had been diagnosed with diabetes, 61.6% with hypertension, 57.2% with obstructive sleep apnea and 17.4% with hypothyroidism. The slight majority of patients underwent a Roux-en-Y gastric bypass (55.5%). In comparison, 43.6% of patients were treated with sleeve gastrectomy and 0.9% underwent other weight loss surgery (Table 1).

In our study of 1297 patients, 177 had a diagnosis of depression, 147 had a diagnosis of anxiety and 428 had diagnoses of both anxiety and depression. Five hundred forty-five patients had neither a diagnosis of anxiety nor depression. Furthermore, 145 patients received treatment for depression, 157 patients received treatment for anxiety and 320 patients received treatment for both conditions. Six hundred seventy-five patients did not receive mental health treatment, whether they had a diagnosis or not. The total amount of follow-up time for each patient was 12 months after bariatric surgery. Of the 1297 patients originally included in this study, only

Table 1 Patient characteristics

Patient characteristics	Frequency (%)
Average age; mean±SD	44 ± 12.28
Average baseline BMI; mean±SD	47.39 ± 8.76
Gender	
Female	1055 (81.3)
Male	242 (18.7)
Surgery type	
RYGB	720 (55.5)
Sleeve gastrectomy	566 (43.6)
Other	11 (0.9)
Race	
White	800 (61.7)
Black	239 (18.4)
Hispanic	241 (18.6)
Other	17 (1.3)
Relationship status	
Single	240 (18.5)
Unmarried partner	152 (11.7)
Married	684 (52.7)
Divorced	179 (13.8)
Widowed	38 (2.9)
Comorbidities	
Hypertension	799 (61.6)
Diabetes	445 (34.3)
Obstructive sleep apnea	742 (57.2)
Hypothyroidism	226 (17.4)

1113 patients were included in the statistical analysis due to loss of follow-up or missing data points in 184 patients.

Predictors of ED visits

Information about ED visits was available for 1133 patients. One hundred eighty-six patients visited the ED at least one time for bariatric complications within 12 months following surgery; 947 patients did not. In patients with at least one mental health diagnosis, the only factor associated with prediction of ED visits with patients who received a sleeve gastrectomy, which had lower ED visit rates than those who had Roux-en-Y gastric bypass surgery (OR 0.558, 95% CI 0.387, 0.804). Patient age at the time of the procedure, race/ethnicity, diabetes, hypertension, obstructive sleep apnea, hypothyroidism, relationship status and gender were not predictive of ED visits in patients with mental health diagnoses (Table 2).

Similar results were found when analyzing predictors of ED visits among patients being treated for one or more mental illnesses. In the population of patients who received mental health treatment, patients who had sleeve gastrectomy surgery had lower rates of ED visits than those who received Roux-en-Y gastric bypass surgery (OR 0.564, 95% CI 0.392, 0.813). This includes ED visits related to bariatric surgery complications and sequelae of mental health disorders (Table 3). Patient age at the time of the procedure, race/ethnicity, diabetes, hypertension, obstructive sleep apnea, hypothyroidism, relationship status and gender were not predictive of ED visits in patients who received treatment for anxiety, depression or both (Table 4).

Table 2 Mental health diagnosis and emergency department visits

Patient characteristics	Odds ratio (95% CIs)	*P*-value
Patient age at the time of procedure	1.001 (0.985, 1.018)	0.882
Race		
Black*		
Hispanic	1.194 (0.709, 2.009)	0.505
Other	1.757 (0.437, 7.062)	0.427
White	0.922 (0.593, 1.435)	0.719
Baseline BMI	1.020 (1.002, 1.039)	0.034
Diabetes	1.116 (0.780, 1.596)	0.548
Hypertension	0.854 (0.591, 1.235)	0.403
Sleep apnea	0.924 (0.649, 1.317)	0.663
Hypothyroidism	0.648 (0.406, 1.033)	0.068
Relationship status		
Single*		
Divorced	1.281 (0.683, 2.400)	0.440
Non-married partner	1.704 (0.927, 3.131)	0.086
Married	1.534 (0.939, 2.507)	0.088
Widowed	1.212 (0.403, 3.648)	0.732
Mental health diagnosis		
No mental health condition*		
Depression	1.626 (0.996, 2.656)	0.052
Anxiety	1.461 (0.852, 2.507)	0.168
Both anxiety and depression	1.396 (0.941, 2.069)	0.097
Gender	1.236 (0.780, 1.956)	0.367
Surgery type		
Roux-en-Y*		
Sleeve gastrectomy	0.558 (0.387, 0.804)	0.002
Other surgery types	2.221 (0.618, 7.980)	0.221

Association between diagnosis of a mental health condition (treatment for depression, anxiety or both depression and anxiety) with emergendy department visits in the first year following bariatric surgery controlling for the given patient characteristics. Odds ratios, 95% confidence intervals (95% CI)

P-values are given with reference values indicated with*

*Reference category

Predictors of hospital readmission

Information about hospital readmission was available for 1146 patients. Of the 1146 patients, 142 had at least one readmission following bariatric surgery. One thousand four

Table 3 Reasons for ED visits following sleeve gastrectomy or RYGB

Reason for ED visit	Sleeve gastrectomy				RYGB			
	0–3 months	3–6 months	6–12 months	Total	0–3 months	3–6 months	6–12 months	Total
Bariatric complications	72	6	9	87	160	34	40	234
Psychological	15	7	8	30	7	3	6	16
Total	87	13	17	117	167	37	46	250

Table 4 Mental health treatment and emergency department visits

Patient characteristics	Odds ratio, 95% CI	*P*-value
Patient age at the time of procedure	1.000 (0.983, 1.017)	0.983
Race		
Black*		
Hispanic	1.181 (0.701, 1.988)	0.532
Other	1.547 (0.383, 6.247)	0.540
White	0.916 (0.587, 1.428)	0.699
Baseline BMI	1.020 (1.001, 1.039)	0.040
Diabetes	1.111 (0.776, 1.589)	0.565
Hypertension	0.875 (0.605, 1.266)	0.479
Sleep apnea	0.934 (0.656, 1.332)	0.708
Hypothyroidism	0.651 (0.408, 1.038)	0.071
Relationship status		
Single*		
Divorced	1.261 (0.673, 2.362)	0.470
Non-married partner	1.698 (0.925, 3.116)	0.087
Married	1.508 (0.922, 2.465)	0.101
Widowed	1.192 (0.395, 3.596)	0.755
Mental health treatment		
No mental health condition*		
Depression treatment	1.520 (0.916, 2.522)	0.105
Anxiety treatment	1.329 (0.805, 2.196)	0.266
Both anxiety and depression treatment	1.220 (0.808, 1.842)	0.344
Gender	1.272 (0.805, 2.011)	0.303
Surgery type		
Roux-en-Y*		
Sleeve gastrectomy	0.564 (0.392, 0.813)	0.002
Other surgery types	2.150 (0.599, 7.717)	0.241

Association between treatments for a mental health condition (treatment for depression, anxiety or both depression and anxiety) with emergency department visits in the first year following bariatric surgery controlling for the given patient characteristics. Odds ratios, 95% confidence intervals (95% CI)

P-values are given with reference values indicated with *

*Reference category

patients were not readmitted following surgery. In patients with at least one mental health diagnosis, non-married partner relationship status was associated with a lower rate of readmission following bariatric surgery when compared to single relationship status (OR 2.647, 95% CI 1.323, 5.298). Similarly, married relationship status was associated with a lower rate of readmission following bariatric surgery when compared to single relationship status (OR 1.858, 95% CI 1.024, 3.371). Patients with depression, anxiety or both who underwent sleeve gastrectomy surgery were found to be less likely to have hospital readmission when compared to Roux-en-Y gastric bypass surgery (OR 0.383, 95% CI 0.249, 0.598). Patient age at the time of the procedure, race/ethnicity, diabetes, hypertension, obstructive sleep apnea, hypothyroidism, divorced or widowed relationship status, mental health diagnosis status or gender were not predictive of readmission following bariatric surgery in patients who had a mental health diagnosis (Table 5).

In the same patient population, readmission rates were assessed for patients undergoing treatment for a mental health diagnosis. In the population of patients who received mental health treatment, non-married partner relationship status was associated with a lower rate of readmission following bariatric surgery when compared to single relationship status (OR 2.616, 95% CI 1.307, 5.235). Similarly, married relationship status was associated with a lower rate of readmission following bariatric surgery when compared to single relationship status (OR 1.852, 95% CI 1.020, 3.364). Patients being treated for a diagnosed mental illness who underwent sleeve gastrectomy surgery were found to be less likely to have hospital readmission when compared to Roux-en-Y gastric bypass surgery (OR 0.382, 95% CI 0.248, 0.587). This includes readmissions for both bariatric surgery complications and mental illness (Table 6). Patient age at the time of the procedure, race/ethnicity, diabetes, hypertension, obstructive sleep apnea, hypothyroidism, divorced or widowed relationship status, mental health diagnosis status, or gender were not predictive of readmission following bariatric surgery in patients who received treatment for anxiety, depression or both (Table 7).

Discussion

Based on past studies conducted on this topic, we hypothesized that we would find a similar pattern in which patients with a history of mental illness would have a higher rate of ED visits in the year following weight loss surgery. However, in this study of almost 1300 patients who underwent

Table 5 Mental health diagnosis and readmission

Patient characteristics	Odds ratio, 95% CI	*P*-value
Patient age at the time of procedure	1.005 (0.986, 1.024)	0.616
Race		
Black*		
Hispanic	0.969 (0.531, 1.768)	0.918
Other	2.395 (0.579, 9.910)	0.228
White	0.897 (0.545, 1.477)	0.670
Baseline BMI	1.012 (0.992, 1.033)	0.244
Diabetes	0.902 (0.601, 1.353)	0.617
Hypertension	0.812 (0.607, 1.391)	0.302
Sleep apnea	0.934 (0.547 1.205)	0.708
Hypothyroidism	0.900 (0.553, 1.464)	0.672
Relationship status		
Single*		
Divorced	1.679 (0.810, 3.483)	0.164
Non-married partner	2.647 (1.323, 5.298)	0.006
Married	1.858 (1.024, 3.371)	0.042
Widowed	0.309 (0.038, 2.520)	0.273
Mental health diagnosis		
No mental health condition*		
Depression	1.494 (0.855, 2.612)	0.159
Anxiety	1.454 (0.798, 2.650)	0.221
Both anxiety and depression	1.469 (0.943, 2.287)	0.089
Gender	1.082 (0.650, 1.800)	0.763
Surgery type		
Roux-en-Y*		
Sleeve gastrectomy	0.383 (0.249, 0.598)	< 0.001
Other surgery types	1.842 (0.465, 7.293)	0.384

Association between diagnoses of a mental health condition (treatment for depression, anxiety or both depression and anxiety) with hospital readmissions in the first year following bariatric surgery controlling for the given patient characteristics. Odds ratios, 95% confidence intervals (95% CI)

P-values are given with reference values indicated with *

*Reference category

Table 6 Reasons for readmission in first year following bariatric surgery

Reason for readmission	RYGB	Sleeve gastrectomy	Total
Bariatric complications	148	48	196
Psychological	2	6	8
Total	150	54	204

Table 7 Mental health treatment and readmission

Patient characteristics	Odds ratio, 95% CI	*P*-value
Patient age at the time of procedure	1.004 (0.986, 1.023)	0.643
Race		
Black*		
Hispanic	0.964 (0.528, 1.761)	0.906
Other	2.268 (0.555, 9.263)	0.254
White	0.901 (0.546, 1.486)	0.684
Baseline BMI	1.012 (0.991, 1.033)	0.252
Diabetes	0.929 (0.619, 1.393)	0.721
Hypertension	0.929 (0.613, 1.407)	0.728
Sleep apnea	0.840 (0.566 1.247)	0.387
Hypothyroidism	0.905 (0.555, 1.475)	0.689
Relationship status		
Single*		
Divorced	1.682 (0.810, 3.492)	0.163
Non-married partner	2.616 (1.307, 5.235)	0.007
Married	1.852 (1.020, 3.364)	0.043
Widowed	0.338 (0.042, 2.757)	0.311
Mental health treatment		
No mental health condition*		
Depression treatment	0.898 (0.477, 1.693)	0.740
Anxiety treatment	1.609 (0.945, 2.741)	0.080
Both anxiety and depression treatment	1.177 (0.743, 1.867)	0.487
Gender	1.164 (0.689, 1.905)	0.599
Surgery type		
Roux-en-Y*		
Sleeve gastrectomy	0.382 (0.248, 0.5877)	< 0.001
Other surgery types	1.762 (0.445, 6.985)	0.420

Association between treatments for a mental health condition (treatment for depression, anxiety or both depression and anxiety) with hospital readmissions in the first year following bariatric surgery controlling for the given patient characteristics. Odds ratios, 95% confidence intervals (95% CI)

P-values are given with reference values indicated with*

*Reference category

bariatric surgery, patients diagnosed with depression, anxiety or depression and anxiety were not found to have more postoperative ED visits than patients without a history of mental illness. Additionally, these patient populations did not have increased hospital readmissions in the year following surgery compared to patients without a diagnosed mental illness. Both analyses controlled for factors that may influence postoperative complications and lead to ED visits and hospital readmissions, such as surgery type, hypertension, diabetes, obstructive sleep apnea, hypothyroidism, race and gender. Furthermore, patients who underwent a sleeve gastrectomy had a lower rate of ED visits and readmissions regardless of mental health diagnoses while patients who underwent a Roux-en-Y gastric bypass or other weight loss surgery had higher rates of ED visits, even after controlling for the abovementioned variables.

Previously published literature suggested that those with mental health concerns before surgery are more likely to have a higher need for postsurgical support, have increased

numbers of ED visits for physical and emotional concerns, and have a higher number of days in the hospital [1, 8]. There is an indication that patients with mental health conditions are more likely to be readmitted within 30 days after surgery for medical reasons and patients who were younger, female and who were not receiving mental health care were also more likely to be readmitted [10, 11]. In general, it is assumed that patients with a psychiatric history will have poorer outcomes and declined weight loss rates than their control counterparts; this finding often initially results in lower referral rates for bariatric surgery [12]. In addition, a survey of mental health professionals that conducted bariatric surgery eligibility interviews found that over 90% said that a psychiatric illness was a "clear contraindication" to these procedures [12]. Our findings dispute these assumptions, as our patient population with a psychiatric history did not have increased rates of ED visits or readmissions compared to their control counterparts.

In addition to these findings, the literature suggests that bariatric surgery may positively affect mental health. Two major pathways could explain this. First, losing weight could enhance body image, self-worth, empowerment, and interpersonal relationships. Second, alterations in intestinal physiology after surgery may somehow influence the brain's signaling pathways. Some evidence in the literature suggests an association between bariatric surgery and a reduction in the prevalence, frequency, and severity of depressive symptoms. Therefore, the severely obese patient with depression not only gains physical benefits after surgery but may also gain psychological benefits [1, 13–16]. Unfortunately, multiple studies reporting these improvements in mood and anxiety symptoms within the first year following bariatric surgery found that the improvements were not sustained in the following years [1, 17, 18]. However, the eventual increase in mood symptom burden after the first year remains lower than at baseline (before surgery), demonstrating an overall decrease in depression and anxiety [18].

A secondary finding in this study was an increase in emergency department visits in the first year after bariatric surgery in patients who underwent gastric bypass compared to sleeve gastrectomy. Current literature has found this same phenomenon. Macht et al. found that patients with a gastric bypass procedure rather than a gastric sleeve had 3.6% more emergency department visits in the first 90 days following surgery [19]. Additional literature describes a continuation of this increase in emergency department visits throughout the first year following surgery. Furthermore, our study found an increase in emergency department visits specifically related to bariatric surgery complications among patients who received a gastric bypass rather than a sleeve gastrectomy. This further agrees with current literature, as studies suggest that patients who undergo laparoscopic gastric bypass have higher rates of major and minor complications following surgery [20]. It is worth mentioning that although higher complication rates were found, there was no increase in mortality [21]. These findings of increased visits leading to an additional strain on the healthcare system may warrant further investigation into the cause of these complications and what may be done to prevent them.

One limitation of this study is the inability to account for the time of diagnosis of mental illness. The time of diagnosis was self-reported by patients and many gave a general timeframe rather than a specific date of diagnosis. Thus, we could not calculate the average length of illness before bariatric surgery. Similarly, another limitation is the inability to account for the duration of depression and/or anxiety treatment. The start of medication treatment and psychotherapy was also self-reported by patients. We would have preferred to use this information in the analysis but could not due to a lack of data. However, considering there was no difference in ED visits between patients with mental illness and those without, we do not believe controlling for the above variables in the statistical model would have changed our results. Contrary to our findings, Fisher et al. found that patients with mild-to-severe depression or anxiety utilized ED services more than patients without mental illness [8]. Additionally, the depression rate of bariatric patients in our study was lower than previously reported for bariatric patients. One explanation for these discrepancies is the difference in pre-surgery psychological programs between different institutions. Due to the lack of guidelines on how to evaluate patients with mental health illnesses with morbid obesity, there is much variation in the intensity, assessments and scope of programs across the nation [21]. Therefore, the robust psychological emphasis in our institution's bariatric center of excellence may be more intensive than at other bariatric surgery centers. Namely, our institution has a dedicated bariatric psychology service which provides comprehensive pre-operative evaluations of every bariatric surgery candidate to identify their readiness, motivation, behavioral challenges, emotional factors and contraindications for surgery, along with other factors that may impact coping, adjustment, and associated lifestyle changes [22]. Postoperatively, the bariatric psychology service continues to meet with our patients to discuss normalizing eating behavior, body image, self-esteem, emotion regulation, interpersonal skills and compliance. Suppose patients are suicidal or do not feel their anxiety or depression is controlled. Regular psychotherapy is required to improve symptoms and learn how to cope with new eating and exercise habits before surgery. In-center psychologists also meet weekly with surgeons to discuss individual cases and deem patients unfit for surgery based on a psychological evaluation. Bariatric surgery candidates must also meet with a registered dietitian who will also clear the patient for

surgery. This multidisciplinary approach is now common within accredited centers and aims to mitigate postoperative complications, especially for patients diagnosed with mental illness. While mental illness had historically been known to have increased ED visits in the year following surgery, we can now say this risk has been mitigated for those with anxiety and depression [8]. The effectiveness of psychological-based treatment programs has been studied elsewhere and found successful, such as the case of the bariatric surgery and education (BaSE) study, which evaluated the effectiveness of a videoconferencing-based psychoeducational group program after bariatric surgery [19]. Patients with depression before bariatric surgery who were assigned to the BaSE program reported lower depression scores, better health-related quality of life and more weight loss than the control group [19]. This reiterates the need for multidisciplinary programs, including psychotherapy, to support patients with mental illness before bariatric surgery. The future direction of the study should evaluate the impact of psychotherapy in additional subsets of surgical patient populations such as irritable bowel disease, esophageal motility disorders and other pathologies where the brain gut interplay is only now beginning to be understood.

Conclusion

Our study aimed to assess whether there was an increase in ED visits after bariatric surgery among patients with a history of anxiety and/or depression. Previous literature has suggested that patients with these mental illnesses are more likely to utilize ED services following surgery; thus, anxiety and depression may be considered relative or absolute contraindications for weight loss surgery [8, 12]. Additional research suggests that this finding may be similar in patients with bipolar disorder and schizophrenia as well. However, statistical analysis of our patient population did not yield the same results, rather highlighting no additional utilization of ED visits with either anxiety or depression. Furthermore, patients who underwent a sleeve gastrectomy, regardless of mental illness status, were found to have fewer postoperative ED visits related to bariatric complications than patients who underwent a gastric bypass procedure. Our study finds that mental health, specifically anxiety and depression are not predictors of ED visits. This work showcases that bariatric surgery is appropriate for this patient population. At the same time, the study also refutes historical literature highlighting the improvements in the care for this patient population, specifically on psychotherapy.

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Declarations

Disclosures Christopher Garnet DuCoin MD MPH FACS is a consultant for Medtronic, Johnson and Johnson, and Intuitive. Salvatore Docimo JR DO is a consultant for Medtronic, BD, and Boston Scientific. Madison Noom BS, Shelby Remmel BS, Reagan Sandstrom BS, George Padilla JR BS, Abdul-Rahman Fadi Diab MD, Rahul Mhaskar MD MPH PhD, and Joseph Sujka MD have no conflicts of interest to disclose.

References

1. Dawes AJ, Maggard-Gibbons M, Maher AR, Booth MJ, Miake-Lye I, Beroes JM et al (2016) Mental health conditions among patients seeking and undergoing bariatric surgery: a meta-analysis. JAMA 315(2):150–163
2. Mitchell JE, Selzer F, Kalarchian MA, Devlin MJ, Strain GW, Elder KA et al (2012) Psychopathology before surgery in the longitudinal assessment of bariatric surgery-3 (LABS-3) psychosocial study. Surg Obes Relat Dis Off J Am Soc Bariatr Surg 8(5):533–541
3. Sogg S, Lauretti J, West-Smith L (2016) Recommendations for the presurgical psychosocial evaluation of bariatric surgery patients. Surg Obes Relat Dis 12(4):731–749
4. Foley RP, Koball AM, Kallies KJ, Domoff SE (2021) Emergency department encounters, hospital admissions, course of treatment and follow-up care for behavioral health concerns in patients after Roux-en-Y gastric bypass surgery. Surg Obes Relat Dis 17(9):1611–1615
5. Boeka AG, Prentice-Dunn S, Lokken KL (2010) Psychosocial predictors of intentions to comply with bariatric surgery guidelines. Psychol Health Med 15(2):188–197
6. Toussi R, Fujioka K, Coleman KJ (2009) Pre- and postsurgery behavioral compliance, patient health and postbariatric surgical weight loss. Obes Silver Spring Md 17(5):996–1002
7. Simon GE, Arterburn DE (2009) Does comorbid psychiatric disorder argue for or against surgical treatment of obesity? Gen Hosp Psychiatry 31(5):401–402
8. Fisher D, Coleman KJ, Arterburn DE, Fischer H, Yamamoto A, Young DR et al (2017) Mental illness in bariatric surgery: a cohort study from the Portal network. Obesity 25(5):850–856
9. Samuels J, Carmichael H, Hazel K, Velopulos C, Rothchild K, Schoen J (2022) Chronic psychiatric diagnoses increase emergency department utilization following bariatric surgery. Surg Endosc 37:1–9
10. Litz M, Rigby A, Rogers AM, Leslie DL, Hollenbeak CS (2018) The impact of mental health disorders on 30-day readmission after bariatric surgery. Surg Obes Relat Dis 14(3):325–331
11. Heinberg LJ, Marek R, Haskins IN, Bucak E, Nor Hanipah Z, Brethauer S (2017) 30-day readmission following weight loss surgery: can psychological factors predict nonspecific indications for readmission? Surg Obes Relat Dis 13(8):1376–1381
12. Every-Palmer S, Romans SE, Stubbs R, Tomlinson A, Gandhi S, Huthwaite M (2020) Experiences of weight-loss surgery in people with serious mental illness: a qualitative study. Front Psychiatry 12(11):419. https://doi.org/10.3389/fpsyt.2020.00419
13. Buchwald H, Estok R, Fahrbach K, Banel D, Jensen MD, Pories WJ et al (2009) Weight and type 2 diabetes after bariatric surgery: systematic review and meta-analysis. Am J Med 122(3):248-256.e5
14. Christou NV, Lieberman M, Sampalis F, Sampalis JS (2008) Bariatric surgery reduces cancer risk in morbidly obese patients. Surg Obes Relat Dis Off J Am Soc Bariatr Surg 4(6):691–695

15. Kokkinos A, Alexiadou K, Liaskos C, Argyrakopoulou G, Balla I, Tentolouris N et al (2013) Improvement in cardiovascular indices after Roux-en-Y gastric bypass or sleeve gastrectomy for morbid obesity. Obes Surg 23(1):31–38
16. Maggard-Gibbons M, Maglione M, Livhits M, Ewing B, Maher AR, Hu J et al (2013) Bariatric surgery for weight loss and glycemic control in nonmorbidly obese adults with diabetes: a systematic review. JAMA 309(21):2250–2261
17. Karlsson J, Taft C, Rydén A, Sjöström L, Sullivan M (2007) Ten-year trends in health-related quality of life after surgical and conventional treatment for severe obesity: the SOS intervention study. Int J Obes 31(8):1248–1261
18. Gill H, Kang S, Lee Y, Rosenblat JD, Brietzke E, Zuckerman H et al (2019) The long-term effect of bariatric surgery on depression and anxiety. J Affect Disord 1(246):886–894
19. Macht R, George J, Ameli O, Hess D, Cabral H, Kazis L (2016) Factors associated with bariatric postoperative emergency department visits. Surg Obes Relat Dis 12(10):1826–1831
20. Osland E, Yunus RM, Khan S, Alodat T, Memon B, Memon MA (2016) Postoperative early major and minor complications in laparoscopic vertical sleeve gastrectomy (LVSG) versus laparoscopic Roux-en-Y gastric bypass (LRYGB) procedures: a meta-analysis and systematic review. Obes Surg 26(10):2273–2284
21. Pull CB (2010) Current psychological assessment practices in obesity surgery programs: what to assess and why. Curr Opin Psychiatry 23(1):30–36
22. Tampa General Hospital Department of Psychology and Neuropsychology (2023) Bariatric psychology services. https://www.tgh.org/institutes-and-services/psychology-and-neuropsychology/bariatric-psychology-services. Accessed 5 Jul 2023

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