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The Effect of Defense Mechanisms and Eating Awareness on the Probability of Suicide After Bariatric Surgery

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SUMMARY

Objective: This study aims to investigate the relationship between suicide possibilities, defense mechanisms, and eating awareness of patients who have undergone bariatric surgery.

Method: The study sample consisted of 101 patients who had bariatric surgery in a private hospital. People who had at least six months from the date of surgery, who had no pregnancy, and who did not give birth after surgery were included in the study. The Mindful Eating Questionnaire, Suicide Probability Scale, and the Defense Style Questionnaire were applied to the participants.

Results: While the average age of the sample was 52.46±9.72, 54.5% (n=55) were male. Within one year after the operation, 33.7% of (n=34) patients had lost weight between 21-30 kg, while 21.8% (n=22) had lost weight between 11-20 kg. Suicide probability scale scores are predicted by emotional eating (β=0.272, p=0.004), neurotic defense mechanism (β=0.284, p=0.003) and current body mass index (β=0.258, p=0.008).

Conclusion: The possibility of suicide after bariatric surgery is closely related to emotional eating, neurotic defense mechanisms, and body mass index. The solution to the problem of emotional eating rather than decreasing the body mass index may be more effective in decreasing the suicide possibilities of the patients. Therefore, in patients undergoing bariatric surgery, emotional eating is one of the problems that should be handled both before and after surgery.

Keywords: obesity, bariatric surgery, eating disorders, suicide, defense mechanisms

INTRODUCTION

Obesity, which is closely related to type 2 diabetes mellitus, cardiovascular diseases, obstructive sleep apnea, osteoarthritis, gastro-oesophageal reflux disease, hepatobiliary diseases, and polycystic ovary syndrome, is a worldwide public health concern affecting more than 650 million adults. These diseases reduce the life expectancy of people and impair their quality of life (World Health Organisation, 2020).

Various treatment methods are used to treat obesity, ranging from self-dieting to surgical procedures (Sarwer et al. 2019). In recent times, bariatric surgery has been widely used to treat obesity, also playing an influential role in treatment. Research has shown that it leads to effective and permanent weight loss, improvement in comorbidities, increased quality of life, and prolongation of survival time (Federico et al. 2019). One of the areas where improvement has been observed is psychiatric disorders, particularly depression (Dixon et al. 2003). Depression is observed at a significantly higher levels in individuals with obesity than other people in society (Gill et al. 2019). Research has reported that while depression can improve in the short and middle term after bariatric surgery, it can recur in the long term (Ribeiro et al. 2018). Previous research has reported that postoperative depression is associated with inadequate weight loss, weight gain, and the presence of comorbid psychopathology (Ribeiro et al. 2018, Gill et al. 2019). However, an increasing number of studies have added to the current body of literature on suicidal ideation, which is an important symptom of depression following bariatric surgery. Previous research has revealed that most of the risk factors such as suicide attempts, suicidal thoughts, and death by suicide in patients undergoing bariatric surgery are similar

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to those observed in general population (Nock et al. 2008, Wnuk et al. 2020). Risk factors frequently observed in past research are suicide attempts, psychiatric disorders, being single, low education level, alcohol/substance abuse, and unemployment (Wnuk et al. 2020).

A considerable amount of literature has been published on coping strategies and defence mechanisms in predicting suicide risks (Hovanesian et al. 2009, Foto-Özdemir et al. 2016). Research reports that the use of primitive and neurotic defence mechanisms, which should be considered in any treatment program, is an important variable in individuals with depression (Hovanesian et al. 2009). Eating awareness is defined as the correlation between the mind and the body, which provides awareness about the food consumed and the feeling it generates (Sayın et al. 2019). Research provides a broader definition of eating awareness, "the food intake with consciousness on how and why eating behaviour occurs rather than what is eaten, by internalizing the physical hunger-satiety concept and realizing the effect of emotions and thoughts and eating by focusing on the food to be consumed here and now, without being affected by environmental factors and also without judging food choices" (Baer et al. 2005). New evidence on the emergence and maintenance of obesity focuses attention on high levels of negative emotions and emotional lability in obese individuals and less eating awareness (Rossy 2016, Czepczor-Bernat et al. 2019). Some studies suggest that mindfulness-focused interventions in obese individuals can potentially reduce eating binges, increase weight loss and self-efficacy, and simultaneously reduce depression (Kidd et al. 2013). Previous research calls attention to some factors reported as having been particularly associated with weight gain, such as giving priority to extrinsic cues when making decisions about eating, stress, limited IA, and eating to soothe painful emotions (Mitchell et al. 2016). One of the situations closely related to eating awareness is emotional eating. Emotional eating is defined as a condition of binge eating in response to positive or negative emotions regardless of the physiological feeling of hunger (Sevinçer et al. 2017). Previous research indicates that while emotional eating increases in individuals with obesity, eating awareness and discipline decrease (Köse et al. 2016). Individuals who need to feel good during depressive periods primarily satisfy this feeling by eating. A study on the correlation between mental disorders and body image disorders among bariatric surgery candidates, reports having observed a positive correlation between body image disorder and depression, anxiety, and suicidal tendency (Geller et al. 2019). The same study also reports that emotional eating mediated the relationship between body image disorder and suicidal tendency, and further argues that depression and suicidal thoughts are likely to develop in patients having undergone a bariatric surgery could be averted at an early stage by addressing emotional eating (Geller et al. 2019).

To the best of our knowledge, there has been no research on defence mechanisms, which are frequently investigated in patients undergoing bariatric surgery during the examination of their mental state to detect mental disorders. The present study aimed to evaluate the relationship between the probability of suicide in the postoperative period and defence mechanisms, eating awareness, sub-dimensions, and socio-demographic variables in patients who have undergone bariatric surgery.

METHOD

The study was performed in a descriptive cross-sectional study design. The study population consisted of patients who had undergone bariatric surgery in the Medicana International Hospital in Samsun. The hospital performs 100 to 150 bariatric surgery treatments in a year. We had access to data available in the hospital system regarding 193 patients who had undergone surgery in the last two years available in the hospital's system. The patients who had undergone surgery later than six months were not pregnant and did not give birth after the intervention were included in the study. While 167 of these patients were contacted, 26 were unavailable. The patients contacted were informed about the study. Of the study population, 48 patients who did not meet the inclusion criteria were excluded from the study. The online link for the questionnaire prepared for the study was sent to mobile phones of 109 people who agreed to participate in the study. The first page of the online questionnaire form provided an evaluation of data from 101 people who expressed having participated in the study and completed the questionnaires voluntarily.

Of the patients who had undergone surgery 6 to 23 months ago, 48 had undergone closed tube gastric surgery (laparoscopic sleeve gastrectomy) and transit bipartition, 42 had closed mini-gastric passage surgery (laparoscopic mini-gastric bypass), and closed tube gastric surgery had been performed on 11 patients.

General Information Form, Eating Awareness Scale, Suicide Probability Scale, and Defence Styles Test were administered to the participants.

Besides socio-demographic data, the Information Form also included information about parental status, comorbidities, and weight-related issues.

The Eating Awareness Scale was developed by Köse et al. (2016) based on the scale developed by Framson et al. (2009). The scale was designed using a five-point Likert scale model and included 30 items and seven sub-dimensions, namely,

disinhibition, emotional eating, eating control, focusing, eating discipline, awareness, and interference. Higher scores obtained in a sub-dimension indicated a higher level of the characteristics of that sub-dimension. While the Cronbach's Alpha value was set as 0.73 in the original scale, it was 0.69 in the present study.

The Suicide Probability Scale is a tool that was developed by Cull and Gill (1988) to assess suicide risk in adolescents and adults. The validity and reliability test of the scale in Turkish was performed by Durak Batıgün and Hisli Şahin (2018). It is a scale in a four-point Likert design consisting of 36 items. It has four sub-dimensions: Social Support/Self Conception, Temper/Impulsivity, Helplessness/Loneliness, and Suicidal Ideation. Higher scores obtained in a sub-dimension indicated a higher level of the characteristics of that sub-dimension. The Cronbach's alpha value of the scale was found to be 0.83 both in the present study and in that used to test the validity and reliability of the scale.

The Defence Mechanism Styles Test is a tool consisting of 40 items and 20 sub-dimensions designed to evaluate defence styles. These 20 defence mechanisms can also be categorized into three sub-categories, namely mature, neurotic and immature defences. In the test developed by Andrews et al. (1993), each item is evaluated between 1 (strongly disagree) and 9 (strongly agree). The validity and reliability study of the scale in Turkish was performed by Yılmaz et al. (2007).

Analysis of Data

The program SPSS23.0 was used for statistical analyses. The descriptive statistics were indicated in the values of frequency, percentage, median, standard deviance, as well as minimum and maximum values. Since the skewness and kurtosis values of the numerical variables were around ± 2, it was accepted that these variables satisfied the normality assumption (Tabachnick and Fidell 2013). The change between pre-operative weight and current weight was analysed with the Dependent Sample T-test. The total score of the Suicide Probability Scale was taken as the dependent variable in the multiple linear regression analysis. In this regression analysis, a stepwise regression analysis technique was used to avoid the problem of multicollinearity. Internal reliability coefficients (Cronbach's alpha) were used to evaluate the reliability of the scale. The significance level in the statistical analysis was set as $p<0.05$.

Ethical Considerations

Before undertaking the investigation, ethical clearance dated 11.06.2020 with reference number 83116987-390 was obtained from the Ethical Board for Clinical Research affiliated with the Deanery of the Medicine Faculty of Tokat Gaziosmanpaşa University. The study was performed in line with the Ethical Principles stipulated in the Helsinki Declaration of the World Medicine Association (WMA). Consent was also obtained from all the participants.

RESULTS

Table 1 shows the distribution by demographic and disease characteristics. Of the study sample, 54.5% (n=55) were men, and 42.6% (n=43) were between 46 and 55 years of age. Regarding marital status, 92.1% (n=93) expressed being married, and 93.1 (n=94) reported having children. While 80.2% (n=81) were diagnosed with diabetes, 54.5% (n=55) suffered from comorbidities such as hypertension, hyperlipidaemia, hypothyroidism, asthma, gout, heart disease, gastro-oesophageal reflux. While the mean age of the sample was 52.46±9.72, their age range varied from 24 to 81. None of the participants in the sample had suicide attempt in their medical records.

Table 1. Socio-demographic and Clinical Characteristics of the Participants (n=101)

Variables	Number	Percentage
Gender		
Women	46	45.5
Men	55	54.5
Age		
≤ 45	24	23.8
46 - 55	43	42.6
56 - 65	26	25.7
≥ 66	8	7.9
Marital Status		
Single	8	7.9
Married	93	92.1
Parental Status		
Yes	94	93.1
No	7	6.9
Number of Children (n = 94)		
≤ 2	51	54.3
≥ 3	43	45.7
Diagnosis of Diabetes		
Yes	81	80.2
No	20	19.8
Comorbidities*		
Yes	55	54.5
No	46	45.5
	Mean ± SD	**Min - Max**
Age	52.46 ± 9.73	24 - 81
Height (cm)	164.37 ± 9.79	142 - 190

Mean + SD: Mean + Standard Deviation; Min-Max: Minimum and Maximum
* Hypertension, Hyperlipidaemia, Hypothyroidism, Asthma, Gout, Heart Disease, Gastro-oesophageal Reflux

Table 2. Changes in the Pre-operative and Current Weight and BMI

Variables	Mean ± SD	Median	Min.-Max	t	p
Weight before surgery (kg)	101.36±19.71	99	65-177	19.779	<0.001
The current weight (kg)	74.82±14.32	73	50-123		
BMI before surgery (kg/m^2)	37.67±6.97	35.62	26.8-72.1	19.497	<0.001
The current BMI (kg/m^2)	27.80±4.90	26.72	17.3-45.2		
Weight after surgery (kg)					
Mean ± SD (Median (Min-Max))	26.53 ± 13.48 (26 (5-78))				
	n (%)				
≤ 10 kg	12 (11.9)				
11-20 kg	22 (21.8)				
21-30 kg	34 (33.7)				
31-40 kg	17 (16.8)				
≥ 41 kg	16 (15.8)				

BMI: Body Mass Index; Mean ± SD: Mean + Standard Deviation, Min.-Max: Minimum-Maximum; Dependent Sample T-Test was used.

Table 3. Results of the evaluation of variables predicting the total score of the Suicide Probability Scale by multiple linear regression analysis

Model	Variables	β	t	p	F	p	R^2	Adjuster R^2
Model 1	Emotional Eating	0.254	2.614	0.010	6.835	0.010	0.065	0.055
Model 2	Emotional Eating	0.263	2.766	0.007	6.412	0.002	0.116	0.098
	Neurotic Defences	0.226	2.381	0.019				
Model 3	Emotional Eating	0.272	2.948	0.004	7.037	<0.001	0.179	0.153
	Neurotic Defences	0.284	3.003	0.003				
	The Current BMI	0.258	2.728	0.008				

Table 2 shows the weight and Body Mass Index (BMI) changes recorded in the pre-and postoperative periods. The results indicate a significant difference in the weight (p<0.001) and BMI (p<0,001) of the patients after surgery. While 33.7% (n=34) of the patients lost weight between 21 - 30 kg, 21.8% (n=22) lost between 11 - 20 kg.

Table 3 shows the results of the evaluation of variables used to predict the total score of the Suicide Probability Scale by multiple linear regression analysis. Age, gender, marital status, pre-operative and the current BMI, the sub-dimensions of the Defence Styles Test (immature, neurotic, and mature defences), and the sub-dimensions of the Eating Awareness scale (disinhibition, emotional eating, eating control, focusing, eating discipline, awareness, and interference) were included in the models designed. The variables used to predict the total score of the Suicide Probability Scale were the sub-dimension of emotional eating of the Eating Awareness Scale (β=0.272; p=0.004), the sub-dimension of neurotic defences of the Defence Styles Test (β=0.284; p=0.003), and the current BMI (β=0.258); p=0.008). While the first model explains 5.5% of the variance, the second and third models explain 9.8% and 15.3% of the variance, respectively.

DISCUSSION

Patients who have undergone bariatric surgery show higher suicide rates than the general population (Peterhänsel et al. 2013). Therefore, it is essential to determine the factors that may affect suicide risk in bariatric surgery patients. In the present study, we investigated BMI, defence mechanisms and eating awareness characteristics, which might influence the probability of suicide in the first two years after surgery in patients who have undergone bariatric surgery for obesity. Analyses show that emotional eating, one of the sub-dimensions of eating awareness and neurotic defence mechanisms, one of the sub-headings of Defence Mechanism Styles, and the current BMI of the patients, had positive predictive effects on suicide probability.

Suicidal behaviour is more common in people with abnormal eating behaviours or those diagnosed with eating disorders than in the general population (Corcos et al. 2002). Abnormal eating behaviours constitute a significant burden on public health, and early detection can be a factor that helps avert suicidal thoughts and prevent suicides (Unikel et al. 2006). Emotional eating has been conceptualized as an eating behaviour that is assumed to occur only in response to emotions, not because of the feeling of hunger or because

of the need for food intake at mealtime or because of social necessity (Bekker et al. 2004). Research suggests that emotional eating is triggered by negative emotions and is often associated with low self-esteem, feelings of inadequacy, and eating disorders (Taylor et al. 1996, Waller and Matoba 1999). It has also been reported that emotional eating is more common in individuals with low weight control and high BMI (Blair et al. 1990).

With the Eating Awareness Scale used in the present study, the concepts of mindless eating, emotional eating, eating control, awareness, eating discipline, conscious nutrition, and the concept of being affected by external factors were evaluated. Of these concepts, limited self-awareness, interference, and emotional eating are related to obesity (Mitchell et al. 2016, Konttinen et al. 2019). However, a limited number of studies have been performed that have correlated the possibility of suicide with the factors related to eating awareness other than emotional eating. Since emotional eating, which is conceptualized as eating in response to negative emotions, is associated with the development of depression and obesity (Konttinen et al. 2019), it is not surprising that it is also associated with suicide in this patient group. Suicidal tendencies have been reported in individuals with obesity and those diagnosed with an eating disorder (Pompili et al. 2006, Zerwas et al. 2015). Two studies investigated eating tendency in response to emotions of people who presented for weight loss surgery (Hörchner et al. 2002, Walfish 2004). The results show that these individuals attribute weight gain to eating behaviour in response to emotions and that this population scores higher on emotional eating measures than normal control groups. These studies did not, however, provide information about the relationship between these variables with postoperative outcomes. Even though research has reported no apparent connection between emotional eating and suicide risk, it is suggested that eating disorders may be a risk factor for suicide attempts and death by suicide (Pompili et al. 2006, Zerwas et al. 2015). In a follow-up study they conducted with bariatric surgery patients, Geller et al. report that the positive change in emotional eating had a predictive effect on reducing postoperative depression (Geller et al. 2019). No research has been found that has investigated the relationship between emotional eating and suicide risk in patients who have undergone bariatric surgery. However, evidence shows the relationship between depression and changes in emotional eating characteristics in these patient groups. In the present study, depression may have been mediating the predictive effect of emotional eating on suicide risk observed in the study.

Theories about ego functioning define the use of specific defence mechanisms by individuals with suicidal behaviour (Kaslow et al. 1998). These include self-directed aggression, primitive division, primitive idealization, regression, and identification with the aggressor. Besides, in cases of perceived abandonment or loss of self-esteem, an impairment of the reality testing may frequently occur in the context of regression associated with dysphoria and anger (Kaslow et al. 1998). In one study, depressive patients with recent suicide attempts scored higher, especially in immature defence mechanisms such as passive aggression, autistic fantasy, and projection, compared to patients who had not recently attempted suicide (Corruble et al. 2004). Although there have been no studies investigating defence mechanisms and suicide risk in bariatric surgery patients, research on suicide has focused mainly on immature defence mechanisms. Another study comparing obese patients without psychiatric symptoms with a healthy control group reports that immature and neurotic defence mechanisms such as denial, suppression, reaction formation, projection, and displacement were significantly higher in individuals with obesity (Zoccali et al. 2008). In the present study, the detection of neurotic defence mechanisms among the variables predicting the possibility of suicide can be considered as an expected result. However, immature defence mechanisms were not found to be a predictor of probability of suicide. In this case, variables that indicate ego power, such as the condition of the patients in the study sample seeking help for treatment and the absence of suicide attempts in their medical history, may affect this result.

Two large-scale studies with samples consisting of people from the general population report that individuals with high BMI in both women and men have less suicide risk than those with low BMI, but this result has been interpreted as the potential correlations of BMI and suicide risk being of a complex nature (Kaplan et al. 2007, Mukamal et al. 2007). A recent literature review reports that the results of past research generally indicate a positive relationship between BMI and suicide risk (Heneghan et al. 2012). Despite this ongoing debate, a growing literature also suggests that the risk of suicide may increase after bariatric surgery compared to obese controls that have not undergone such surgery (Mitchell et al. 2013).

High BMI is associated with suicidal ideation (Dutton et al. 2013) and suicide attempts (Wagner et al. 2013) in samples of patients having undergone non-bariatric surgery. However, unlike the results observed in the present study, another study performed with bariatric surgery patients found that BMI was associated with suicide (Windover et al. 2010). Although results of past research might be contradictory, the argument that high BMI increases the risk of suicide seems to dominate most studies. The study's findings have certain limitations though, such as having been conducted with a cross-sectional study design from a single centre and that the surveys had to be conducted only in an online environment due to the pandemic.

CONCLUSION

The possibility of suicide after bariatric surgery is closely related to emotional eating, neurotic defence mechanisms, and body mass index. The improvement in problems associated with emotional eating may be effective in decreasing the suicide probability of the patients rather than the decrease in body mass index. Therefore, emotional eating in patients undergoing bariatric surgery is one of the problems that should be carefully addressed both in the pre-and postoperative period. Another variable that predicts suicide probability are neurotic defence mechanisms. In psychiatric examinations performed before and after surgery, mental health professionals should pay more attention to patients who frequently employee neurotic defence mechanisms from a suicidal perspective while evaluating the possibility of suicide. Prospective follow-up studies with larger samples need to be performed to understand suicide and determine the risks in bariatric surgery patients.

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