

Association Between the Success of Bariatric Surgery and Personality Traits

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ABSTRACT

Objective: Acceptable preoperative psychosocial indicators of weight loss after obesity surgery in morbidly obese(MO) patients are still unknown. In this study, the association between personality traits, multidimensional perceived social support, and the percentage of excess weight loss (EWL) following obesity surgery was researched in MO patients.

Methods: Participants in this prospective study were recruited from MO patients who applied to the hospital's obesity unit between July 2021 and June 2022. The study comprised 84 MO individuals. The Temperament and Personality Inventory (TCI) was used to evaluate the personality traits of the MO. Perceived social support was measured using the multidimensional perceived social support scale. The percentage of weight loss after obesity surgery was compared with personality traits and perceived social support scores.

Results: The mean age of the patients who were MO was 36.7 ± 8.7 years. There were 22 men (25.3%) and 62 women (74.7%). The mean preoperative BMI was 46.2 ± 6.3 . The perceived social support score was 68.0 ± 16.4 . A univariate analysis found a positive relationship between 6 months and one year's EWL and Self-Transcendence, a TCI subcategory ($p=0.011, p=0.023$).

Conclusion: Obesity treatment is a complex situation that requires a multidisciplinary approach. Given the potential physiological and psychological consequences of obesity surgery, it is critical to uncover psychological predictive factors such as personality traits that boost the success of obesity surgery and are connected with weight loss. As a result, knowing the individuals who self-transcendence before obesity surgery may be useful in predicting the success of obesity surgery and planning treatment. This requires large-scale research.

Keywords: Obesity surgery; Personality; Self-transcendence



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INTRODUCTION

Obesity is a chronic condition that causes a number of medical problems. Morbid obesity (MO) is defined as obesity that reduces lifespan and can have serious consequences depending on the risks it poses. For the treatment of obesity, there are numerous non-pharmacological options. One of the most effective non-pharmacological treatments for MO is obesity surgery. Patients who have a BMI of at least 40, a BMI of 35 to 40 who have

tried n dietary therapy but failed, and certain specific medical comorbidities should consider having obesity surgery. Weight loss following obesity surgery has been shown to reduce some obesity-related problems such as diabetes, and hypertension [1]. However, there are discrepancies in the outcomes of obesity surgery for patients who are MO. Some people have difficulty losing weight after surgery. Some of them began to put on the weight they lost after the operation in the sixth month

[2]. It has been noted in studies on the variations in long-term outcomes after obesity surgery that this circumstance is related to psychological variables [3]. It is crucial to be aware of these psychosocial aspects of weight loss, given the risk and expense of the procedure. Additionally, if these psychosocial characteristics are found, they can be used to help choose MO individuals for surgery and create follow-up strategies for people who are less likely to lose weight. Numerous studies on the causes of weight gain or loss after obesity surgery have been published in the literature. An association between preoperative problematic eating and postoperative weight gain was discovered in a study [4]. In another study, it was revealed that various behaviors, such as non-compliance with treatment programs, were related to decreased weight reduction after obesity surgery [5].

Recent research has concentrated on the association between weight loss following obesity surgery and personality traits and social support. In the literature, investigations undertaken for this aim have discovered conflicting results between a certain personality attribute and the extent of post-operative weight loss [6,7]. While there is a body of literature on the topic, the relationship between personality traits and the outcomes of obesity surgery remains inconclusive due to conflicting findings. Some studies suggest a potential positive association between specific personality traits, such as self-discipline and motivation, and improved surgical outcomes. However, the mechanisms underlying this relationship and the consistency of these results require further investigation and clarification through rigorous research.

There are few studies examining the link between perceived social support and post-surgical weight loss, despite the fact that the relationship between social support and weight loss has been extensively researched in the literature [8]. As opposed to objective social support, it has been suggested that subjectively

felt multidimensional social support may be a better indicator of psychological adjustment [9]. In conclusion, acceptable preoperative psychosocial indicators of weight loss after obesity surgery in MO patients are still unknown. In this study, the association between personality factors, multidimensional perceived social support, and the percentage of excess weight loss (EWL) following obesity surgery was researched in MO patients.

MATERIALS AND METHODS

Participants in this prospective study were recruited from MO patients who applied to hospital's obesity unit between July 2021 and June 2022. A committee of general surgery specialists, endocrine specialists, dietitians, and psychiatrists selects patients for surgery in the obesity unit.

The study comprised 84 MO individuals. Patients who were deemed unfit for surgery were referred to non-surgical treatment and were thus excluded from this study. The study excluded ten respondents because they refused to participate and three people because they filled out the scales improperly. Obese subjects aged 18–65 years with a BMI 40 kg/m² were included in the study. The aim of the study was explained to the participants, and their permission was obtained. First of all, the sociodemographic data of the individuals and their preoperative weight were recorded. Second, the TCI was used to evaluate the personality traits of the MO. Finally perceived social support was measured using the multidimensional perceived social support scale.

Those who accepted the study and had obesity surgery (Roux-en-Y gastric bypass) were tracked prospectively for one year beginning in July 2021. Weights were taken three, six, and twelve months after the operation. The percentage of excess weight loss (%EWL) was calculated. EWL was calculated by subtracting the preoperative weight from the postoperative weight, dividing the result by the preoperative weight, and multiplying by 100 [10]. The percentage of weight reduction was compared with personality attributes and perceived social support scores.

Temperament and Personality Inventory (TCI)

TCI stands for TCI. TCI is a 240-item self-assessment scale established by Cloninger (1987) to measure temperament and character characteristics based on Psychobiological Personality Theory [11]. It consists of four temperaments: novelty seeking (NS), harm avoidance (HA), reward dependency (RD), and persistence (P), as well as three personality sub-dimensions: self-

Main Points;

- Our findings suggest that there is a relationship between personality traits and the success of bariatric surgery.
- Self-transcendent individuals lost more weight after bariatric surgery.
- There was no association revealed between the temperament subscales and bariatric surgery success.

directedness (SD), cooperativeness (C) and self-transcendence (ST). The Temperament character inventory in Turkish was employed in the study. In a study on the mean (M) and standard deviation (SD) of TCI scales and subscales in Turkish population subjects, NS=18.5±5.00, HA= 6.8± 6.4, RD=14.1± 3.2, P =4.8 ±1.9, SD=29.1 ± 6.2, C= 29.4 ± 5.9 and ST= 18.6 ± 5.4 results were obtained [12].

The Multidimensional Scale of Perceived Social Support (MSPSS)

The belief that one can get help when needed is characterized as perceived social support. It's a seven-point Likert scale. Developed by Zimet et al. it is made up of three sub-dimensions: the family support dimension, the friend support dimension, and the special human support dimension, totaling 12 items [13]. The study made use of the Turkish version [14].

Statistical Analysis

The variables preoperatively described above were subjected to descriptive statistics. Data analysis for testing hypotheses was always done at the end of the study. First, a series of univariate analyses were carried out to examine the connection between the pertinent preoperative factors and the EWL at each endpoint. For variables that were continuous, Pearson correlation was applied. Following examination of the sample's normality distribution, t-tests for independent samples and ANOVAs were applied to categorical variables. The data were analyzed using SPSS software (v 22.0; SPSS Inc., Chicago, IL).

RESULTS

The mean age of the patients who were MO was 36.7 ±8.7 years. There were 22 men (25.3%) and 62 women (74.7%). The mean preoperative BMI was 46.2 ±63. The perceived social support score was 68.0±16.4. TCI scores of MO individuals were similar to those of the healthy Turkish population (Table1).

Table 2 shows the univariate analysis, which demonstrated a positive connection between 6 months and one year's EWL and preoperative BMI (p=0.032, p=0.002). EWL was found to be higher in unmarried MO patients at three months (p=0.010). Furthermore, a negative connection was discovered between three months EWL and the age of Obesity Onset. A univariate analysis found a positive relationship between 6 months and one year's EWL and Self-Transcendence, a TCI subcategory (p=0.011, p=0.023) (Table 2).

Table 1. Baseline features of the sample of 84 patients who have undergone Roux-en-Y gastric bypass

	Total (n=84)
Age (years)—mean (SD)	36.7 (±8.7)
Gender—n (%)	
Male	22 (25.3)
Female	62 (74.7)
Marital Status—n (%)	
Single	14 (16.9)
Married	63 (75.9)
Wife passed away	1 (0.01)
Divorced	6 (7.2)
Preoperative BMI —mean (SD)	46.2 (±6.3)
Age of onset of obesity —mean (SD)	16.8 (±8.4)
Perceived social support —mean (SD)	68.0 (±16.4)
Temperament and Character Inventory —mean (SD)	
NS—mean (SD)	17.3 (±5.1)
HA —mean (SD)	17.8 (±6.4)
RD —mean (SD)	13.0 (±3.2)
P —mean (SD)	4.6 (±2.0)
SD* —mean (SD)	26.0 (±6.9)
C —mean (SD)	28.9 (±6.9)
ST —mean (SD)	21.3 (±5.9)

TCI; Temperament and Character Inventory, HA; harm avoidance, NS; novelty seeking, RD; reward dependence, P; persistence, SD*; self-directedness, C; cooperativeness, ST; self-transcendence

DISCUSSION

In this study, the association between personality and the success of obesity surgery in MO patients was studied. In our study, a positive link was discovered between %EWL at 6 months and 1 year following obesity surgery and Self-Transcendence (ST), one of the Temperament and Character Inventory (TCI) subcategories.

Temperament and character are two sub-dimensions of personality. Temperament is a genetically determined characteristic of personality. The side learned through societal interaction is character. Temperament is inherited and does not alter. Character is the dimension of personality learned through social interaction. Depending on the environment, this may alter over time [15]. There was no correlation between the percentage of weight loss following obesity surgery and temperament sub-dimensions in our study. Only one of the character sub-

Table 2. Association between %EWL and baseline variables across the endpoints of patients who have undergone Roux-en-Y gastric bypass

	3-month %EWL		6-month %EWL		1-year %EWL	
	(n=84)	p value	(n=84)	p value	(n=84)	p value
Preoperative BMI ^a	0.075	0.508	0.257	0.032**	0.367	0.002*
Age ^a	-0.181	0.108	-0.190	0.115	-0.079	0.519
Gender ^b		0.206		0.712		0.087
Male	14.1 (±5.4)		25.8(±6.0)		37.7(±4.8)	
Female	15.1(±4.3)		23.9(±6.4)		33.8(±8.3)	
Marital Status ^c		0.010** (Group1>Group2)		0.114		0.136
Single(Group 1)	17.1(±3.4)		25.6(±6.0)		35.3(±6.7)	
Married(Group 2)	14.6(±4.4)		23.8(±5.7)		33.9(±7.3)	
Divorced (Group 3)	15.2(±5.9)		30.1(±12.6)		43.1(±16.4)	
Age of Onset of Obesity ^a	-.254	0.023*	-0.162	0.180	-0.101	0.410
Perceived social support ^d	-0.052	0.649	-0.061	0.618	0.117	0.338
Temperament and Character Inventory —mean (SD)						
NS ^a	-0.065	0.565	0.084	0.490	-0.054	0.660
HA ^a	-0.035	0.756	-0.105	0.389	-0.209	0.085
RD ^a	0.097	0.391	0.056	0.647	-0.057	0.642
P ^a	0.162	0.152	0.177	0.143	0.085	0.486
SD* ^a	0.005	0.963	-0.041	0.738	-0.072	0.558
C ^a	0.109	0.337	0.128	0.290	0.003	0.982
ST ^a	0.006	0.958	0.302	0.011**	0.273	0.023**

*p<0.005, **p<0.05, ^aPearson's correlation, ^bT test for independent samples, ^cANOVA

TCI; Temperament and Character Inventory, HA; harm avoidance, NS; novelty seeking, RD; reward dependence, P; persistence, SD*; self-directedness, C; cooperativeness., ST; self-transcendence

dimensions, Self-Transcendence, showed a positive association. Self-transcendence is the attempt to exceed one's own potential and attain gains greater than oneself. Beyond himself, it is the individual's efforts to benefit the environment and social life that, in self-transcendence, the individual attempts to solve not just his own difficulties but also the issues of others [16]. There is no evidence in the literature that there is a link between self-transcendence and weight loss following obesity surgery. This finding may contribute to the literature for new research.

The role of personality traits as predictors of obesity surgery outcome is still uncertain [17]. The findings of the few studies available are inconsistent. Some research revealed no association between personality traits and the outcome of weight loss [18-22]. A few studies on temperament sub-dimensions and postoperative weight loss were discovered

after a literature search. According to certain studies, there may be a link between weight loss after obesity surgery and some sub-dimensions of personality traits. Novelty-seeking is a behavior that is motivated by fresh discoveries. A few studies have identified a link between higher novelty-seeking ratings and more weight loss [6, 7]. Persistence is defined as the state of remaining determined and constant in the face of adversity [15]. Low-persistence obese individuals have been observed to have fewer consistent lifestyle modifications required for weight loss after obesity surgery; hence, lower Persistence scores are positively associated with reduced weight loss [6, 23]. In other words, those who scored better on persistence lost more weight. A small number of studies studying the association between character sub-dimensions and postoperative weight loss were reported in the literature. A small number of studies have found a link between increased cooperativeness and weight loss after

obesitysurgery. This was explained by the MO person with a high Cooperativeness score interacting with social groups similar to himself and seeking more social support [24]. Higher self-directedness scores were associated with greater short-

term weight loss in one study [25]. In our study, no relationship was found between novelty seeking, persistence, harm avoidance, and reward dependence, which are the temperament sub-dimensions of personality, and weight loss after obesitysurgery. There was also no relationship between the personality sub-dimensions of cooperativeness, self-directedness, and weight loss after obesitysurgery. This may be connected to the small number of our patients. Despite the limited evidence in the literature, there seems to be an association between personality traits and the outcome of obesitysurgery [26, 27]. There is much research in the literature studying the association between obesitysurgery success and social support. In most of the investigations, it has been observed that social support groups have a favorable contribution [28, 29].

There are few studies investigating the relationship between perceived social support, which is defined as different from social support, and obesitysurgery success.

Perceived social support refers to how a person perceives social assistance. In our study, there was no correlation between weight loss after obesitysurgery and perceived social support. Only one study in the literature directly explored perceived social support and obesitysurgery success. In this study, a difference in perceived social support in MO people before and after obesitysurgery was studied, but no difference was identified. There was no link discovered in the same study between the perceived social support and the level of post-operative weight loss [30].

Our research has some limitations. Because psychological pre-assessment is required for the operation, MO people may have hidden their problems and made themselves appear better than they really are. Our sample size was limited. Finally, we followed MO patients for up to 12 months following obesitysurgery. Our understanding of the long-term implications is inadequate.

CONCLUSION

Obesity has an extensive variety of effects on the body's systems, including the endocrine, cardiovascular, respiratory, genitourinary, gastrointestinal, musculoskeletal, and skin

systems. It is also a medical issue that must be addressed due to the detrimental consequences it has on the psychological condition. In this regard, treatment must take a multidisciplinary approach. Given the potential physiological and psychological consequences of obesitysurgery, it is critical to uncover psychological predictive factors such as personality traits that boost the success of obesitysurgery and are connected with weight loss. Despite contradicting findings, there appears to be a relationship between personality traits and the outcome of obesitysurgery. As a result, knowing the individuals who self-transcendence before obesitysurgery may be useful in predicting the success of obesitysurgery and planning treatment. Large-scale studies are needed for this.

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Informed Consent: All participants in the study provided informed consent and written permission to publish their data.

Conflicts of Interest:The authors state that they have no conflicts of interest to disclose in relation to the present study

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REFERENCES

- [1] Adams TD, Davidson LE, Litwin SE, Kolotkin RL, LaMonte MJ, Pendleton RC, et al. (2012). Health benefits of gastric bypass surgery after 6 years. *JAMA*. 308(11):1122-1131. <https://doi.org/10.1001/2012.jama.11164>
- [2] Courcoulas AP, King WC, Belle SH, Berk P, Flum DR, Garcia L, et al. (2018). Seven-Year Weight Trajectories and Health Outcomes in the Longitudinal Assessment of ObesitySurgery (LABS) Study. *JAMA Surg*. 153(5):427-434. <https://doi.org/10.1001/jamasurg.2017.5025>

- [3] Kruseman M, Leimgruber A, Zumbach F, Golay A. (2010). Dietary, weight, and psychological changes among patients with obesity, 8 years after gastric bypass. *J Am Diet Assoc.* 110(4):527-534. <https://doi.org/10.1016/j.jada.2009.12.028>
- [4] de Zwaan M, Hilbert A, Swan-Kremeier L, Simonich H, Lancaster K, Howell LM, et al. (2010). Comprehensive interview assessment of eating behavior 18-35 months after gastric bypass surgery for morbid obesity. *Surg ObesRelat Dis.* 6(1):79-85. <https://doi.org/10.1016/j.soard.2009.08.011>
- [5] Wheeler E, Prettyman A, Lenhard MJ, Tran K. (2008). Adherence to outpatient program postoperative appointments after bariatric surgery. *Surg ObesRelat Dis.* 4(4):515-520. <https://doi.org/10.1016/j.soard.2008.01.013>
- [6] Gordon PC, Sallet JA, Sallet PC. (2014). The impact of TCI personality traits on long-term outcome of Roux-en-Y gastric bypass. *Obes Surg.* 24(10):1647-1655. <https://doi.org/10.1007/s11695-014-1229-7>
- [7] Generali I, De Panfilis C. (2018). Personality Traits and Weight Loss Surgery Outcome. *CurrObes Rep.* 7(3):227-234. <https://doi.org/10.1007/s13679-018-0315-x>
- [8] Stromberg SE, Gonzalez-Louis R, Engel M, Mathews A, Janicke DM. (2020). Pre-surgical stress and social support predict post-surgical percent excess weight loss in a population of bariatric surgery patients. *Psychol Health Med.* 25(10):1258-1265. <https://doi.org/10.1080/13548506.2020.1734216>
- [9] Conceição EM, Fernandes M, de Lourdes M, Pinto-Bastos A, Vaz AR, Ramalho S. (2020). Perceived social support before and after bariatric surgery: association with depression, problematic eating behaviors, and weight outcomes. *Eat Weight Disord.* 25(3):679-692. <https://doi.org/10.1007/s40519-019-00671-2>
- [10] Oria HE, Moorehead MK. (2009). Updated Obesity Analysis and Reporting Outcome System (BAROS). *Surg ObesRelat Dis.* 5(1):60-66. <https://doi.org/10.1016/j.soard.2008.10.004>
- [11] Cloninger CR. (1987). A systematic method for clinical description and classification of personality variants. A proposal. *Arch Gen Psychiatry.* 44(6):573-588. <https://doi.org/10.1001/archpsyc.1987.01800180093014>
- [12] Kose S, Sayar K, Kalelioglu U, Aydin N, Celikel FC, Gulec H, et al. (2009). Normative data and factorial structure of the Turkish version of the TCI. *Compr Psychiatry.* 50(4):361-368. <https://doi.org/10.1016/j.comppsy.2008.09.007>
- [13] Zimet GD, Dahlem NW, Zimet SG, Farley GK. (1988). The multidimensional scale of perceived social support. *Journal of personality assessment.* 52(1), 30-41.
- [14] Eker D, Arkar H. (1995). Factorial structure, validity, and reliability of the multidimensional scale of perceived social support. *Turk Psikoloji Dergisi.* 10(34).
- [15] Cloninger CR, Svrakic DM, Przybeck TR. (1993). A psychobiological model of temperament and character. *Arch Gen Psychiatry.* 50(12):975-990. <https://doi.org/10.1001/archpsyc.1993.01820240059008>
- [16] Frankl VE. (1946). Self-transcendence as a human value. *J. Hum. Psychol.* 6, 97-106.
- [17] Claes L, Vandereycken W, Vandeputte A, Braet C (2013) Personality subtypes in female pre-obesity obese patients: do they differ in eating disorder symptoms, psychological complaints and coping behaviour?. *Eur Eat Disord Rev.* 21(1):72-77. <https://doi.org/10.1002/erv.2188>
- [18] Tayefi A, Pazouki A, Alavi K, Salehian R, Soheilipour F, Ghanbari Jolfaei A. (2020). Relationship of personality characteristics and eating attitude with the success of bariatric surgery. *Med J Islam Repub Iran.* 34:89. <https://doi.org/10.34171/mjiri.34.89>
- [19] Canetti L, Berry EM, Elizur Y. (2009). Psychosocial predictors of weight loss and psychological adjustment following bariatric surgery and a weight-loss program: the mediating role of emotional eating. *Int J Eat Disord.* 42(2):109-117. <https://doi.org/10.1002/eat.20592>
- [20] van Hout GC, Hagendoren CA, Verschure SK, van Heck GL. (2009). Psychosocial predictors of success after vertical banded gastroplasty. *Obes Surg.* 19(6):701-707. <https://doi.org/10.1007/s11695-008-9446-6>
- [21] Herpertz S, Kielmann R, Wolf AM, Hebebrand J, Senf W (2004) Do psychosocial variables predict weight loss or mental health after obesity surgery? A systematic review. *Obes Res.* 12(10):1554-1569. <https://doi.org/10.1038/oby.2004.195>
- [22] Larsen JK, Geenen R, Maas C, de Wit P, van Antwerpen T, Brand N, et al. (2004). Personality as a predictor of weight loss maintenance after surgery for morbid obesity. *Obes Res.* 12(11):1828-1834. <https://doi.org/10.1038/oby.2004.227>
- [23] De Panfilis C, Cero S, Torre M, Salvatore P, Dall'Aglio E, Adorni A, et al. (2006). Utility of the TCI (TCI) in outcome prediction of laparoscopic adjustable gastric banding:

- preliminary report. *Obes Surg.* 16(7):842-847. <https://doi.org/10.1381/096089206777822278>
- [24] Agüera Z, García-Ruiz-de-Gordejuela A, Vilarrasa N, Sanchez I, Baño M, Camacho L, et al. (2015). Psychological and Personality Predictors of Weight Loss and Comorbid Metabolic Changes After Bariatric Surgery. *Eur Eat Disord Rev.* 23(6):509-516. <https://doi.org/10.1002/erv.2404>
- [25] Leombruni P, Pierò A, Dosio D, Novelli A, Abbate-Daga G, Morino M, et al. (2007). Psychological predictors of outcome in vertical banded gastroplasty: a 6 months prospective pilot study. *Obes Surg.* 17(7):941-948. <https://doi.org/10.1007/s11695-007-9173-4>
- [26] Ouellette AS, Rodrigue C, Lemieux S, Tchernof A, Biertho L, Bégin C. (2017). An examination of the mechanisms and personality traits underlying food addiction among individuals with severe obesity awaiting bariatric surgery. *Eat Weight Disord.* 22(4):633-640. <https://doi.org/10.1007/s40519-017-0440-7>
- [27] Marek RJ, Ben-Porath YS, Merrell J, Ashton K, Heinberg LJ. (2014). Predicting one and three month postoperative Somatic Concerns, Psychological Distress, and Maladaptive Eating Behaviors in bariatric surgery candidates with the Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI-2-RF). *Obes Surg.* 24(4):631-639. <https://doi.org/10.1007/s11695-013-1149-y>
- [28] Beck NN, Johannsen M, Støving RK, Mehlsen M, Zachariae R. (2012). Do postoperative psychotherapeutic interventions and support groups influence weight loss following bariatric surgery? A systematic review and meta-analysis of randomized and nonrandomized trials. *Obes Surg.* 22(11):1790-1797. <https://doi.org/10.1007/s11695-012-0739-4>
- [29] Torrente-Sánchez MJ, Ferrer-Márquez M, Estébanez-Ferrero B, Jiménez-Lasserrotte MDM, Ruiz-Muelle A, Ventura-Miranda MI, et al. (2021). Social Support for People with Morbid Obesity in a Bariatric Surgery Programme: A Qualitative Descriptive Study. *Int J Environ Res Public Health.* 18(12):6530. <https://doi.org/10.3390/ijerph18126530>
- [30] Mackey ER, Olson A, Merwin S, Wang J, Nadler EP. (2018). Perceived Social Support for Exercise and Weight Loss in Adolescents Undergoing Sleeve Gastrectomy. *Obes Surg.* 28(2):421-426. <https://doi.org/10.1007/s11695-017-2853-9>

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