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Childhood trauma and personality characteristics in obese individuals with and without binge eating disorder

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Abstract
The aim of this study is to determine the potential differences in temperament and character, childhood trauma and the level of depression of obese patients with binge eating disorder (BED) according to obese subjects without BED and healthy controls. The study included 30 obese patients with BED according to DSM-5 diagnosis criterias, 30 obese subject without BED whom had applied to Ondokuz Mayıs University Faculty of Medicine Endocrinology Clinic and 30 healthy controls with normal weight (BMI=18,5-24,9 kg/m²), which are suitable with regard to demographic variables. The subjects evaluated with Beck Depression Inventory, Childhood Trauma Questionnaire, Temperament and Character Inventory. There was no difference between the groups in terms of the level of depression. It was found that childhood emotional abuse is higher in obese patients with BED than healthy controls. No significant difference were found in terms of childhood traumas between obese patients with BED and obese patients without BED.

Keywords: binge eating disorder, obesity, childhood traumas, temperament and character

1. Introduction
The obesity is defined as the increase in the amount of fat tissue in the body in the way deteriorating the health. It is a disease that increases the prevalence of diabetes mellitus, hypertension, ischemic heart disease, osteoarthritis, sleep apnea syndrome, and some of cancer types; deteriorates the quality of life and reduces the lifetime [1]. Nowadays, the method that is most frequently used in evaluating the obesity is Body Mass Index (BMI). World Health Organization (WHO) classified the body mass index values as follows: 18.5-24.9= normal weight, 25-29.9= overweight, >30= obese, >40=morbid obese

In etiology of obesity, there are various factors such as genetic and neuroendocrinology factors, nourishment, dietary habits, decrease in physical activity, psychological factors, deterioration of appetite and nutrition control, psychotropic medication, and smoking habit. Besides that, no specific reason could be found for the obesity in many cases [2]. In studies carried out in order to determine the psychiatric aspects of obesity etiology, generally the childhood traumas, impulsivity, personality characteristics, self-esteem, and body perception. According to the results obtained from these studies, decrease in self-esteem, deterioration of body perception, and childhood traumas are widely seen among the obese individuals [3, 4].

Binge eating disorder (BED) is defined as eating more than most people can in a discrete period of time, under specific conditions, during this episode, the excessive intake of food is accompanied by the loss of control. These individuals might eat abnormally fast and at large amounts until they feel uncomfortably and when they are not physically hungry. The prevalence of BED varies between 1.0 and 4.6% in general adult population [5], while the prevalence of obesity was reported to be 65.3% among the individuals with BED [6].

The risk factors of obesity and psychiatric disorders are claimed to be related with the etiology of BED. Fairburn *et al*. (1998) reported the risk factors of BED as being exposed to negative comments regarding body, weight, and eating, obesity in childhood, obesity in family, depression in family, and negative experiences in childhood [7]. The binge eating behavior is reported to frequently accompany the sexual and physical abuse in childhood and to cause adult period obesity [8]. In literature, there are few studies examining the childhood traumas among the obese individuals with BED [7, 9].

Moreover, the personality characteristics of individuals might contribute to the predisposition to obesity development by intervening to the eating habit. The personality is defined as the personal and internalized thought, perception, and behavior patterns developed in order to adapt to internal and external environment and originating from the personality, structural factors, developmental factors, and social experiences. In psychobiologic model of Cloninger, the personality has four temperament dimensions: “novelty seeking”, “harm avoidance”, “reward dependence”, and “persistence” [10]. The novelty seeking is related with behavioral activation system and includes predisposition to exploring a new stimuli, making impulsive decisions, taking it to extremes regarding the approach to reward clues, having a quick temper, and actively avoiding from being restrained. Harm avoidance is related with the behavioral inhibition system and is a hereditary predisposition to preventing or ceasing the behavior. The reward dependence is related with the behavioral maintenance system and is a hereditary predisposition manifesting itself as sensuality, social attachment, and dependence on the approval of others. Persistence is a hereditary predisposition to persisting against fatigue and frustration [10, 11]. In personality model of Cloninger, there is a character definition having three

dimensions as "self-directedness", "cooperativeness", and "self-transcendence". Self-directedness consists of accepting the responsibility regarding one's own preferences, determining the objectives that are personally meaningful, and developing the skills and self-confidence in solving the problems. Cooperativeness refers to social acceptance, capacity for empathy, utility, virtuousness, and conscientiousness. Self-transcendence consists of loss of self, interpersonal identification, and moral acceptance [11].

In previous studies, when compared to obese individuals having no BED, the obese individuals having BED were reported to have higher scores in harm avoidance and novelty seeking and lower scores in self-directedness and cooperativeness [12, 13].

The aim of present study is to investigate the temperaments, personality characteristics, and childhood traumas of obese individuals with and without binge eating disorder.

2. Materials and Methods

Among the patients, who applied to Endocrinology Clinic of Medical Faculty of Ondokuz Mayıs University for losing weight and were diagnosed for obesity after the completion of endocrinal examinations, the ones fitting to the inclusion criteria were involved in the present study. Since the binge eating disorder is more frequently seen among the obese patients seeking for losing weight, the sample of this study consisted of obese individuals, who applied to endocrinology clinic. In the present study, 30 obese patients with and 30 without BED, who were diagnosed in accordance with DSM-5 criteria, were involved in study group, and 30 healthy volunteers with normal weight (BMI=18.5-24.9 kg/m²) and having the same demographical characteristics with study group were involved in control group. The research project was approved by the Ethics Committee of Medical Faculty of Ondokuz Mayıs University. The participants involved in this study were required to be aged minimum 18 years, to be literate, and to have sufficient intelligence in order to understand the offered scales. Having a psychiatric disorder was set as the exclusion criterion for all the participants. Moreover, the patients having a medical disorder (such as Cushing syndrome, hyperthyroidism, diabetes, and hypothalamic disorders) 4 and using drug (such as glucocorticoids and anti-thyroid medications) were not involved in obese groups.

2.1 Assessment

2.1.1 Sociodemographic data form

This is a semi-structured interview form examining age, sex, educational status, income level, employment status, marital status, psychiatric background, and family history.

2.1.2 Beck's depression scale

In this 21-item scale questioning the depressive symptoms, the subject is asked to specify the statement defining how he/she feels himself/herself at best [14]. The objective of this scale is not to make a diagnosis for depression but to objectively determine the level of depressive symptoms. Each of items involves four options and is scored between 0 and 3. It is one of the most widely used instruments in assessing the severity of depressive symptoms among psychiatric patients and normal samples. The reliability and validity studies of its Turkish version were carried out by Hisli *et al*. (1989) [15].

2.1.3 Temperament and Character Inventory

Cloninger developed a general psychobiologic concept in order to define the structure and development of character [10]. TCI, which is a self-report scale, was developed in order to measure the temperament and character dimensions and 25 sub-dimensions of them. The dimensions of temperament are novelty seeking, harm avoidance, reward dependence, and persistence. The dimensions of character are self-directedness, cooperativeness, and self-transcendence. The scale consists of 240 items answered with "true" and "false". There is no time-limit for the implementation of this scale. The reliability and validity studies of its Turkish version were carried out by Köse *et al.* (2004) [11].

2.1.4 Childhood Trauma Questionnaire

This is a 5-Point Likert type and self-reporting based questionnaire consisting of 28 items and is useful in quantitatively examining the abuse and negligence experiences during the childhood [16]. It has six sub-categories examining physical / emotional / sexual abuse, and physical / emotional negligence, and minimization examining the denial of trauma. The scores of sub-scales other than minimization vary between 5 and 25, whereas the sum of scores varies between 25 and 125. The minimization sub-scale doesn't contribute to the total score. The denial of trauma is questioned via three questions. The minimization score is obtained by calculation how many of these questions were scored with 5 points. The reliability and validity studies of its Turkish version were carried out by Şar *et al*. (2012) [17].

2.2 Statistical Analysis

The analysis of data obtained from patient groups was performed using "SPSS for Windows 15.0" statistical package software. The data obtained by counting were expressed as percentage, whereas the data obtained via measurement were expressed as arithmetical mean + standard deviation. Chi-Square test was used in comparison of categorical data, One-Way ANOVA among the parametric tests was used in comparing the numeric variables of groups, and Tukey HSD and Tamhane's tests were applied if there is a difference (depending on the homogeneity of variance). The level of significance was set at 0.95 ($p<0.05$).

3. Results

No statistically significant difference was found between three groups involved in presents study in terms of age, sex, educational status, marital status, employment status, place of living, income level, and psychiatric disease history in family ($p>0.05$). There was no statistically significant difference between obesity and obesity + BED (OBED) groups in terms of BMI ($p=0.778$).

Statistically significant difference was found between the groups in terms of the scores in sub-scales of harm avoidance, self-directedness, and cooperativeness. In pairwise comparisons, OBED group was found to have statistically significantly higher score in harm avoidance ($p=0.030$; $p=0.000$) and statistically significantly lower scores in self-

directedness (p=0.006; p=0.005) and cooperativeness (p=0.008; p=0.000) sub-scales when compared to obesity group and control group, respectively. No statistically significant difference was found between obesity and control groups (p>0.05). No statistically significant difference was found between the groups in terms of the scores in depression scale (p>0.05).

In childhood trauma questionnaire, there were statistically significant differences between the groups in terms of scores in emotional abuse sub-scale (p=0.006). In pairwise comparisons, the score of OBED group in emotional abuse sub-scale was found to be statistically significantly higher than that of control group (p=0.007).

4. Discussion

Although BED is mainly observed among obese individuals, it might develop together with various levels of BMI. In a society-based study examining the binge eating disorder, it was reported that 70% of individuals with BED were obese, 20% were overweight, and 10% were normal weight [12]. This rate was found to vary between 20 and 30% among obese individuals seeking for treatment in order to lose weight and between 33 and 47% among the obese patients referred to bariatric surgery [8]. In a study comparing obese individuals with and without BED, the BMI values of obese individuals with BED were found to be higher than those of obese individuals without BED [18]. But, in many studies carried out on this subject, it was reported that there was no difference between the mean BMI values of groups [9, 19, 20]. In the present study, no difference was found between obese individuals with and without BED in terms of BMI values. This finding corroborates the idea that BED might be seen with at BMI levels among obese individuals.

In the present study, among the obese individuals with BED, the age of obesity onset was determined to be 21.1±1.97 years, whereas that of obese individuals without BED was found to be 25.26±1.86 years. This finding conforms to the literature reporting that BED starts after the obesity [21, 22]. It was asserted that the weight problems of patients might have caused going on a diet and this might have triggered the binge eating [22]. But, there also are the studies arguing that there is no such relationship between beginning of BED and going on a diet [23]. In study of Grilo *et al*. (2009) examining 404 obese patients with BED, the authors reported the age of obesity onset to be 16.2±9.7 years and that of BED to be 25.9±12.7 years, but it was also stated that those data collected retrospectively and based on self-reports of individuals might be wrong or biased [24].

In studies comparing the depression levels of obese individuals with and without binge eating disorder, different results were obtained. Some of the researchers reported that depression scores of obese individuals with BED were higher than those of obese individuals without BED [19, 25, 26]. In study of Annagür *et al*. (2012), the depression scale scores of obese individuals with and without BED were found to be higher than that of control group [27]. In some of the studies, no difference was found between the depression scale scores of obese individuals with and without BED [8.18].

In the present study, in which the individuals having clinical depression and anxiety disorder were not involved, no significant difference was determined between the groups in terms of depression scale scores, but the depression levels of obese individuals with and without BED were found to be higher than that of control group. We believe that this might arise from performing the binge eating behavior secretly or when the patients are alone, obesity and resulting appearance being more judged than BED, and the alienation of individuals.

It was reported that the traumatic experiences during the childhood period might cause obesity in adulthood through the deteriorated eating habits and/or psychological mechanisms [28]. In study of D'Argenio *et al*. (2009) on comparing the obese with and without past and current psychiatric disorders to the healthy controls, the authors reported that the early-life traumatic experiences are a risk factor for development of obesity in adulthood [29]. Kong and Bernstein (2009) stated that the emotional abuse, physical negligence, and sexual abuse in childhood might be the predictors of psychopathologies related with eating [30]. Grilo and Masheb (2001) reported that BED patients were exposed to trauma three times more than control groups were [31].

Yanovski *et al*. (1993) reported that obese individuals with and without BED have reported sexual abuse history and there was no statistically significant difference between these groups [9]. In study of Grilo *et al*. (2005) on examining 340 morbid obese patients applying for obesity surgery, it was found that there was no difference between the obese individuals with and without BED in terms of childhood traumas [24]. In study of Allison *et al*. (2007), they determined that BED patients have been exposed to emotional negligence at highest level during their childhood. In the same study, it was reported that there was no significance between the physical and sexual abuse reports and there was a correlation between emotional and physical abuse and depressive symptom levels [26]. In the present study, it was determined that the obese individuals with BED were exposed to emotional abuse more than control group was. This finding corroborates the idea that the ones that have been exposed to emotional abuse at higher levels are more prone to development of obesity and BED in adulthood period.

These different results obtained from the studies might originate from the fact that the assessment of childhood traumas was performed based on self-reports. The cultural structure of these individuals might lead them to perceive or remember the childhood traumas in a different manner or to report the trauma differently due to similar reasons.

It was reported that the personality characteristics might play role in development of disease by influencing the food intake and eating behavior. It was determined that the obese individuals participating in weight-control program have higher scores in reward dependence and cooperativeness when compared to the obese individuals not participating in any weight-control program [32].

In another study, it was reported that “harm avoidance” scores of obese individuals seeking after no treatment for losing weight and that of obese individuals that cannot lose weight even though they participate in a weight-control program were higher that the scores of normal weight individuals. In the same study, it was also determined that the “self-directedness” and “cooperativeness” scores of individuals that successfully

lost weight were higher than those of individuals seeking after no treatment [33].

In study of Villarejo *et al*. (2012) comparing the eating disorders of those with life-long obesity (n=398) and those without (n=985), it was reported that the obese individuals with eating disorder have higher "harm avoidance" and lower "persistence", "self-directedness", and "cooperativeness" scores than the obese individuals without eating disorder [34].

Sarısoy *et al*. (2014) determined that the "harm avoidance" scores of obese were higher than that of normal weight individuals. In that study, it was also reported that the individuals having high score in harm avoidance might eat more in order to relax when they are anxious and have worry, and that moving less in relation with their lower energy level might cause weight gain [35].

In previous studies, it was reported that harm avoidance and novelty seeking scores of obese individuals with BED were higher, whereas self-directedness and cooperativeness scores were lower [13, 34].

Similar to the present study, it was reported in study of Grucza *et al*. (2007) that the obese individuals did not differ from non-obese individuals in temperament and personality characteristics but the individuals with binge eating disorder had higher harm avoidance and novelty seeking scores and lower self-directedness and cooperativeness scores [12].

In the present study, the harm avoidance scores of obese individuals with BED were higher than obese individuals without BED and individuals in control group, whereas their cooperativeness and self-directedness scores were found to be lower. No significant difference was observed between obese individuals with BED and those without in terms of temperament and personality characteristics.

Higher "harm avoidance" scores make individuals more prone to anxiety, depression, and low self-respect, and also those individuals were observed to have fear, shyness, problem avoidance, and pessimistic perspective. The ones having low "self-directedness" scores accuse others and are dependent, irresponsible, unconfident, and unskillful. The ones having low "cooperativeness" scores are the unhelpful and intolerant individuals, who see the others as enemies [10]. These personality characteristics isolate the individuals, put them into a fragile and unkind position, and prevent them from establishing permanent relationships. They might fail to cope with the problems and then exhibit uncontrolled eating behavior. This might contribute to OBED group's different temperaments when compared to the obese group. The individuals exhibiting similar characteristics in personality dimension give similar responses under same conditions, and this might trigger the binge eating behavior among the obese patients.

5. Conclusion

In the present study, it was determined that harm avoidance scores of obese individuals with BED were higher than those of obese individuals without BED and those of control group, that their cooperativeness and self-directedness scores were lower, and that the emotional abuse in childhood were observed more frequently in obese individuals with binge eating disorder when compared to individuals in control group.

One of the most important obstacles to struggle with in treatment of obesity is the binge eating behavior. As a result of present study, it was determined that, among the obese individuals applying for treatment, the individuals having binge eating disorder differ from the obese individuals without binge eating disorder in terms of temperament, personality characteristics, and childhood traumas.

6. Tables and Figures

Table 1: Comparision of sociodemografic characteristics of three groups.

		OBED (n=30)	Obesity(n=30)	Control (n=30)	Statistical value	P value
Sex	Female n (%)	24 (%80)	23 (%76.7)	25 (%83.3)	χ^2=0.417	0.812
	Male n (%)	6 (%20)	7 (%23.3)	5 (%16.7)		
Age (year)	Mean ± SD	33.23±11.66	35.60±10.38	32.36±9.86	F=0.739	0.481
Years of education	Mean ± SD	12.23±3.60	11.80±3.82	11.76±3.48	F=0.154	0.858
Marital status	Married n (%)	14 (%46.7)	19 (%63.3)	17 (%56.7)	χ^2=1.710	0.425
	Single n (%)	16 (%53.3)	11 (%36.7)	13 (%43.3)		
Employment status	Employeed n (%)	14 (%46.7)	18 (%60)	19 (%63.3)	χ^2=1.900	0.387
	Unemployeed n (%	16 (%53.3)	12 (%40)	11 (%36.7)		
Place of residence	Province n (%)	25 (%83.3)	27 (%90)	27 (%90)	χ^2=0.829	0.661
	Village n (%)	5 (%16.7)	3 (%10)	3 (%10)		

Table 2: Comparision of TCI and BDI scores of three groups.

	OBED (1)	Obesity (2)	Control (3)	Statistical value	P value	Post hoc (Tukey)
Novelty seeking	18.50±5.76	18.16±4.63	18.86±4.54	F=0.147	0.864	-
Harm avoidance	20.20±5.92	16.53±5.33	14.23±5.16	F=9.030	0.000	1/3, 1/2
Reward dependence	14.40±3.11	14.63±3.57	13,90±3.34	F=0.375	0.688	-
Persistence	5.03 ±1.63	5.26±1.72	4.40±1.87	F=1.988	0.143	-
Self-directedness	25.36±5.30	29.60±5.51	29.70±4.73	F=6.799	0.002	1/3, 1/2
Cooperativeness	26.70±4.73	30.50±4.47	31.63±5.14	F=8.728	0.000	1/3, 1/2
Self-transcendence	19.63±4.63	19.16±4.86	19.60±4.82	F=0.089	0.915	-
BDI score	8.86±3.92	7.73±3.16	6.80±4.05	F=2.303	0.106	-

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