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Examination of The Relationship Between Eating Behavior Disorder and Emotional Eating Behavior in University Students

Üniversite Öğrencilerinde Yeme Davranış Bozukluğu ile Duygusal Yeme Davranışı Arasındaki İlişkinin İncelenmesi

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ABSTRACT

Objective: *This study was conducted to evaluate the eating habits, eating attitudes, and behaviors of university students and to determine the relationship between binge eating disorder and emotional eating.*
Method: *This study was conducted with individuals studying at a university in Malatya. In the study, the Dutch Eating Behaviors scale was used to determine the emotional eating status of individuals, and the Edinburgh Bulimia Research Test scale was used to detect the binge eating disorder of individuals.*
Results: *The mean age of the subjects was found to be 24.21±6.21 years. It was determined that 12.58% of individuals had an Edinburgh Bulimia Research Test scale score of 20 points and above. The mean Edinburgh Bulimia Research Test scale score of the female students participating in the study was 8.24±2.78, and it was 6.18±2.01 for male students (p=0.013). When the distribution of the external eating mean scores was examined according to the Edinburgh Bulimia Research Test scale score categories, it was seen that the external eating scores of the individuals with the Edinburgh Bulimia Research Test scale scores of 20 and above were 28.87±9.44 (p=0.019). For every 0.021 unit increase in BMI, it leads to a 1.031-fold increase in emotional eating. In the model created with the same variables for the presence of binge eating disorder, it was found that the restrictive eating variable contributed significantly to the model and each 1.078 unit increase increased the risk of binge eating disorder 2.708 times (p<0.05).*
Conclusion: *According to the study results, there are many factors that increase the risk of binge eating disorder in university students. In this study, increased BMI and emotional eating were determined as factors that increase the risk of binge eating disorder.*

Keywords: *Bing eating disorder, college student, emotional eating*

ÖZ

Amaç: *Bu çalışma, üniversite öğrencilerinin yeme alışkanlıkları, yeme tutum ve davranışlarını değerlendirmek ve tıkınırcasına yeme bozukluğu ile duygusal yeme arasındaki ilişkiyi belirlemek amacıyla yapılmıştır.*
Method: *Bu çalışma Malatya da üniversite eğitimi gören bireyler ile yürütülmüştür. Çalışmada bireylerin duygusal yeme durumunun saptanması için Hollanda Yeme Davranışları ölçeği ve bireylerin tıkınırcasına yeme bozukluğunun saptanması için Edinburgh Bulimia Araştırma Testi ölçeği kullanılmıştır.*
Bulgular: *Bireylerin ortalama yaşı 24.21±6.21 yıl olarak saptanmıştır. Bireylerin %12.58'inin Edinburgh Bulimia Araştırma Testi ölçeği puanının 20 puan ve üzerinde olduğu belirlenmiştir. Çalışmaya katılan kız öğrencilerin Edinburgh Bulimia Araştırma Testi ölçeği puanı ortalaması 8.24±2.78, erkek öğrencilerin 6.18±2.01'dir (p=0.013). Bireylerin dışsal yeme puan ortalamalarının Edinburgh Bulimia Araştırma Testi ölçeği puanı kategorilerine göre dağılımı incelendiğinde, Edinburgh Bulimia Araştırma Testi ölçeği puanı 20 ve üzeri olan bireylerin dışsal yeme puanlarının 28,87±9,44 olduğu görülmüştür (p=0.019). Beden kütle indeksindeki (BKİ) her 0.021 birimlik artış için, duygusal yemede 1.031 katlık bir artışa yol açmaktadır. Tıkınırcasına yeme bozukluğu varlığı için aynı değişkenlerle oluşturulan modelde kısıtlayıcı yeme değişkeninin modele anlamlı katkı*

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sağladığı ve her 1.078 birimlik artışın tıkınırcasına yeme bozukluğu varlığı riskini 2.708 kat artırdığı bulunmuştur (p<0.05).
***Sonuçlar:** Çalışma bulgularına göre üniversite öğrencilerinde tıkınırcasına yeme bozukluğu riskini artıran birçok faktör vardır. Bu çalışmada BKİ artışı ve duygusal yeme durumu tıkınırcasına yeme bozukluğu riskini artıran faktörler olarak saptanmıştır.*

***Anahtar kelimeler:** Tıkınırcasına yeme bozukluğu, üniversite öğrencisi, duygusal yeme*

INTRODUCTION

Eating disorders are disorders that occur in eating behavior based on emotional problems. It is an eating disorder in which an individual consumes much more food in a short time than he or she can eat under the same conditions in the same time period, cannot restrain his eating behavior, and excessive eating behavior recurs [(1)]. Unlike bulimia nervosa, these individuals do not exhibit behaviors such as forcing the patient to vomit, using drugs that cause diarrhea or diuretics, restraining the eating habits for a long time, and trying to speed up the metabolism with excessive physical activity. Binge eating disorder (BED), which is seen as a common disease among eating disorders, is defined as binge eating in different sources. Binge is common in individuals with pressure and body dissatisfaction [(2)]. Disturbance in impulse control metabolism is the primary factor in BED and addiction disorders. Binge eating syndrome is associated with increased psychopathology, including depression and personality disorders [(3)]. Antidepressants and behavior modification therapies are effective in the treatment of binge eating disorder. It has been shown that obese individuals with binge eating disorder meet obesity at an earlier age and start dieting than individuals without BED, have more fluctuations in body weight throughout their lives, and have a worse response to obesity treatments [(4)]. Individuals with binge eating disorder support different neurocognitive profiles. When individuals with a high body mass index with binge eating disorder were compared with individuals with a high BMI without binge eating disorder, individuals with binge eating syndrome were associated with high depression and food addiction [(5)]. Binge eating is used to escape self-awareness. Binge eating is a problematic clinical condition in young individuals [(6)]. The prevalence of binge eating disorder increases in adolescence [(7)].

This study was conducted to evaluate the nutritional habits, eating attitudes and behaviors of university students and to determine the relationship between binge eating disorder and emotional eating.

MATERIALS AND METHODS

The study sample consisted of students continuing their education in one of the 2 state universities in Malatya.

"Ethics committee approval" dated 15.01.2022 was obtained from Malatya Turgut Özal University Non-Interventional Clinical Research Ethics Committee; Written consent was obtained from the individuals who agreed to participate in the study, and it was carried out in accordance with the Principles of the Declaration of Helsinki.

Inclusion Criteria
Inclusion criteria for the study; Being a college student means not having received any previous diagnosis or treatment for an eating disorder.

The information collection form used in the study; questions about demographic characteristics in the first part, questions about eating habits in the second part, and questions about general health status in the third part.

Anthropometric measurements
Body weight: Body weight was determined by using a portable body weight measuring device, and individuals were measured with as little clothing as possible. BC-780 device was used in the measurement.

Height of individuals; While in the upright position, the head was in the Frankford plane, the feet were adjacent to the heels, the eye triangle and the top of the auricle were at the same level, the back, hips and heels were in full contact with the back plane and were measured with a stadiometer by taking a deep breath. The BMI values of all women participating in the study were calculated using the equation body weight (kg) ÷ [height (m)]^2. The evaluation of the participants' BMI value was made according to the BMI classification of the World Health Organization (WHO) [(8)].

Waist to hip ratio

Waist measurement was made without applying pressure with a non-stretchable measuring tape, passing through the midpoint of the distance between the lowest rib bone and the cristailiac in accordance with the WHO recommendation, and the measurement data were recorded in cm by the researcher in the relevant part of the questionnaire. Waist circumference measurements were evaluated using the WHO association of chronic disease risk with waist circumference. The measurement of the hip circumference was made by standing on the side of the participant standing upright, with a non-stretchable measuring tape passing through the widest part of the hip, without applying pressure, and the measurement data were recorded in the relevant part of the questionnaire in cm. Individuals' waist/hip ratio was calculated as waist circumference divided by hip circumference [waist circumference (cm) ÷ hip circumference (cm)] [9].

Evaluation scales used in the study

Edinburgh Bulimia Research Test

Binge eating disorder (BED) of individuals M.Henderson and C.P.L. It was determined by the Blumic Investigatory Test Edinburgh (Edinburgh Blumia Research Test), which consists of 33 questions developed by Freeman. The questions were answered considering the last 3 months' feelings and behaviors of the individuals. For questions 1, 13, 21, 23 and 31, no answer will be one point, while for the remaining 25 questions, each yes answer will be 1 point. The test has 2 scales: severity scale and symptom scale. The highest score to be obtained as a result of scoring the answers is 30. Between 0-10 points, there is no eating disorder and eating behavior is normal. Between 11-19 points, there is no binge eating disorder, but there is abnormal eating behavior. He has a binge eating disorder with a score of 20 or more [10]. The Turkish validity and reliability level of the test was conducted by Güzel S. on 50 people. The internal consistency reliability (Cronbach's alpha) coefficient of the test was determined as 0.85 and the intra-class correlation coefficient as 0.91 [11].

Dutch Eating Behaviors Survey

The Dutch Eating Behaviors Questionnaire (DEBQ) was developed by Van Strein et al. in 1986 to measure eating attitudes. DEBQ is a 33-item self-report, Likert-type scale; Each question is scored between 1 (never) and 5 (very often). The scale consists of 'emotional eating', which evaluates the effect of one's mental state on eating, 'restrictive eating', which evaluates the effect of intense fear of gaining weight on eating, and 'external eating', which evaluates the effect of environmental factors on eating attitude. Turkish validity and reliability study was conducted by Bozan in 2009. Although there is no cut-off value for the scale, the high total score indicates the negativity of the eating attitude. The Cronbach's alpha internal consistency coefficient was .94 for the whole scale and for the restrictive, emotional and external eating behaviors subscales, respectively; .91, .97 and .90 [12].

Statistical analyzes

Made using IBM SPSS Statistics for Windows, Version 21.0 software. Kolmogrov-Smirnov and Shapiro-Wilk tests were used to assess the normality of the data. Categorical variables are presented as frequency and percentage, while mean and standard deviation values are given for continuous variables. The Mann-Whitney U test was used to compare the mean values of 2 groups that did not show normal distribution. The Kruskal Wallis H test was used to compare more than 2 groups. A significance level of 5% ($p<0.05$) was used for all statistical comparisons. Regression analysis was performed using the factors affecting BED.

RESULTS

The general characteristics of the students participating in the study are given in Table 1. In the study 56.90% of the individuals participating in the study are female students. The mean age of the students was found to be 24.21±6.21 years, 77.61% of individuals are in the 18-25 age range, 55.56% of the individuals are undergraduate students, 74.35% do not work in any job, 41.01% have a monthly income of 1000 TL or less, 61.12% live in a dormitory, 92.15% do not have any disease, 26.47% have a BMI in the obesity category. It was determined that 72.87% of them had 2 main meals a day, 47.22% of them skipped breakfast.

The BMI score distribution of the students participating in the study according to gender and BMI value is given in Table 2. It was determined that 12.58% of the individuals had a BED score of 20 points or more. The mean BED score of the female students participating in the study was 8.24±2.78, and the male students were 6.18±2.01 points. The difference was found to be statistically significant ($p=0.013$). The mean BMI score of the individuals examined according to the BMI category was found to be 18.33±3.99 points in the obese individuals. When the

Table 1. General Characteristics of Individuals (n=612)

Gender	n	%
Female	347	56.70
Male	265	43.30
Age (year)	24.21±6.21	
AGE GROUPS		
18 years and under	87	14.22
18-25 age	475	77.61
25-30 age	33	5.39
30 years and older	17	2.78
Educational Status		
Associate degree	249	40.69
Licence	340	55.56
Degree	14	2.29
Doctorate	9	1.47
Working Status		
Yes	157	25.65
No	455	74.35
Monthly Income		
1000 TL and below	251	41.01
1000-1500 TL	191	31.21
1500-2000 TL	135	22.06
2000 TL and above	35	5.72
Living place		
House	238	38.88
Student dormitory	374	61.12
Is there any diagnosed disease		
Yes	48	7.85
No	564	92.15
BMI (kg/cm^2)	23.25±9.21	
BMI Category		
Thin	76	12.42
Normal	339	55.39
Fat	162	26.47
Obese	20	3.27
Morbid Obese	15	2.45
Waist/hip ratio		**p***
Female	0.87	0.128
Male	0.93	
Number of daily meals		
1 meal	65	10.63
2 meals	446	72.87
3 meals	101	16.5
Often skipped meal		
Breakfast	289	47.22
Lunch	224	36.60
Evening	99	16.18

p: Mann Whitney U-Test*

BMI score category and BMI category distribution of the students were examined, it was seen that there was a statistically significant distribution (p=0.035).

The examination of the DEBQ scores of the students participating in the study according to the BED score is given in Table 3. When the distribution of the external eating mean scores of the individuals according to BED categories was examined, it was seen that the external eating scores of the individuals with a BED score of 20 and above were 28.87±9.44, which was the highest value compared to the other groups (p=0.019). It was observed that individuals with the highest BED score of 20 and above had the highest emotional eating score (p=0.001).

The correlation analysis of the factors associated with the BED score of the individuals and the r coefficient are given in Table 4. It was determined that there was a correlation between the Restrictive Eating, Emotional Eating and BMI values and the BED score, and this correlation was statistically significant (p<0.05).

Logistic regression models were found to be important in predicting BED risk in individuals. Two different models were created: age, BMI, emotional eating, restrictive eating, waist-hip ratio. Analyzes were made with the advanced LR model. For every 0.021 unit increase in BMI, there is a 1.031-fold risk of BED and a 1.888-fold increase for every 0.877 unit increase in emotional eating. In the model created with the same variables for the presence of BED, it was found that the variable of restrictive eating contributed significantly to the model and each 1.078 unit increase increased the risk of BED presence 2.708 times (p<0.05).

DISCUSSION

University students have serious nutritional problems. In this period, it is seen that uncontrolled overeating in adolescents gradually spreads. Detection of wrong eating habits in this period is important for taking measures to change these habits.

This study was conducted with 612 students, 347 (56.70%) female and 265 (43.3%) male, in order to examine the eating behaviors of university students who have a high risk of developing eating disorders. The evaluation of students' eating habits, eating attitudes and behaviors, and the relationship

Table 2. BED score distribution of individuals by gender and BMI value

	BED (Mean±Sd)	BED score category							
		0-10 points BED NO		11-19 BED Rısk		20 points and above BED YES			
Gender		n	%	n	%	n	%	p^1	p^2
Female	8.24±2.78	248	71.46	59	17.00	40	11.53	0.224	0.013
Male	6.18±2.01	181	68.30	47	17.73	37	13.96		
BMI Category								p^3	p^4
Thin	7.21±2.06	56	9.15	12	1.96	8	1.30	0.025	0.035
Normal	8.33±2.75	245	40.03	56	9.15	38	6.21		
Fat	16.21±4.21	122	19.93	16	2.61	24	3.92		
Obese	18.33±3.99	5	0.82	13	2.20	2	0.32		
Morbid Obese	13.25±3.01	1	0.16	9	1.47	5	0.82		

p^1: Pearson Chi-Square test (BED score category by gender). p^2: Mann Whitney U Test. p^3: Kruskalwallis H Test. p^4: Pearson Chi-Square test, distribution of BMI category according to BED score

Table 3. Comparison of individuals' DEBQ scores according to BED scores

	0-10 score n=429	11-19 score n=106	20 score and upper n=77	p*
DEBQ total score	72.66±20.58	86.11±21.88	86.85±22.24	0.137
Extrinsic eating	22.19±7.65	25.87±8.34	28.87±9.44	0.019
Restrictive eating	27.56±8.11	28.11±16.92	24.87±8.67	0.389
Emotional eating	22.91±12.32	29.13±15.02	33.11±16.92	0.001

p= Kruskalwallis H Test.*

Table 4. Correlation analysis of factors associated with individuals' BED scores

	BED	DEBQ	Extrinsic eating	Restrictive eating	Emotional eating	BMI	Waist Hip Ratio	Age
	r	r	r	r	r	r	r	r
BED	1	0.101	0.019	0.254*	0.341*	0.221*	0.175	0.079

**p<0.01. r: Pearson coefficient of correlation analysis*

Table 5. Estimation of BED risk and BED presence by logistic regression analysis

Models		B	p	Odds Ratio	95% CI	
					Lower	Upper
BED under the risk	BMI	0.021	0.064	1.031	1.000	1.044
	Emotional eating	0.877	0.002	1.888	1.158	3.356
BED (Yes)	Restrictive eating	1.078	<0.001	2.708	1.681	4.894

between binge eating disorder and emotional eating were analyzed.

The age range in which eating disorders are most common is between the ages of 14 and 25, and the risk of eating disorders is reported in 15% of individuals in this age [13,14]. The mean age of the individuals participating in this study was 24.21±6.21 years.

According to the results of the Turkish Diabetes, Hypertension, Obesity and Endocrinological Diseases Prevalence Study-II (TURDEP-II Study), which is one of the important prevalence studies conducted in Turkey; 1% of the population is underweight, 26% is normal weight, 37% is slightly obese, and 36.9% is obese [15]. Plotnikoff et al. [16] on university students, it was determined that 69% of them were in the normal BMI class, and 24.5% were in the slightly overweight and obese class. In this study, it was seen that 26.4% of the individuals were in the obese group and 5.7% in the obese group.

As university students leave their home environment and take more responsibility for their individual nutritional behaviors (purchasing, preparation, etc.), changes occur in their eating habits. In particular, factors such as skipping meals, insufficient food variety, increased frequency of eating outside the home, and snacking and fast-food-based diets cause body weight gain and long-term health-related problems [16]. In the studies, it is seen that the number of snacks consumed during the day is 2 with the highest rate. In this study, it was determined that the majority of the individuals stayed in the dormitory and they had two main meals a day, and the most skipped meal was breakfast.

Nutritional disorders; It is one of the most important risk factors for non-communicable chronic diseases such as diabetes, cardiovascular diseases and cancer. In this study, the majority of individuals (92.15%) did not have a chronic disease.

It is known that there is a relationship between the income that students can spend and their eating habits. A linear relationship was found between personal disposable income and food security and nutrition [17].

In a study evaluating eating disorders in Russia, it was reported that women had higher scores than men in all cases [18]. Nagl et al. [19] used DEBQ, restrictive and emotional eating scores were found to be significantly higher in women compared to men. Similarly, the mean score of women with BED was found to be significantly higher than men in this study.

Eating behaviors such as emotional eating, restrictive eating, and external eating are risk factors for obesity and eating disorders [20,21]. In this study, external eating scores and emotional eating scores of individuals with BED were found to be significantly higher than DEBQ and restrictive eating scores. It was found that restrictive eating behavior contributed significantly to Binge Eating Disorder, and every 1.078 unit increase increased the risk of BED presence 2.708 times, while every 0.877 unit increase in emotional eating increased the BED risk 1.888 times.

Body mass index is an important risk factor for the development of eating disorders. In the study conducted by Musaiger et al. [22] with the participation of 530 university students, it was concluded that the risk of eating disorders is twice as high in individuals with a BMI value of 25 and above. According to the results of another study conducted on 610 university students aged between 17 and 23, it was stated that there was a positive correlation between BMI and the risk of eating disorders [23]. In this study, it was found that obese individuals were at risk of BED, and each 0.021 unit increase in BMI increased the risk of BED 1.031 times.

Rotella et al. [3] conducted a study on 253 female patients over the age of 18 who were diagnosed with AN, BN or any of the binge eating disorders. It was stated that the shape and weight anxiety subscale scores of the Eating Disorder Examination Questionnaire (EDE-Q) were significantly lower. In addition, it has been determined that emotional eating is predominant in patients with binge eating and purging behaviors. In this study, a positive and significant relationship was shown between BITE score and Restrictive Eating, Emotional Eating and BMI values.

CONCLUSION AND RECOMMENDATIONS

Today, it is known that many diseases can occur due to irregular nutrition. Knowing that eating disorders have an early onset will prevent the intensity and incidence of such diseases, reduce the complications arising from them, shorten the duration of treatment and improve the prognosis.

Since BED is a disease that affects the individual psychologically, damages his physical and psychosocial functions and negatively affects the weight control behaviors of the individual, remedial measures should be taken. Nutritional habits also have an important place among life skills and positive lifestyle aimed at improving health. University education is an important period that prepares young people for adult life. It is important to carry out studies to determine the factors affecting the eating attitudes of university students in order to take precautions for the formation of chronic diseases.

Author contribution

Study conception and design: NA, HA; data collection: NA, HA; analysis and interpretation of results: NA; draft manuscript preparation: NA, HA. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Malatya Turgut Özal University Non-Interventional Clinical Research Ethics Committee (Protocol no. 2021/24 / 13.12.2021).

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Conflict of interest

The authors declare that there is no conflict of interest.

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