The Relationship Between Disordered Eating Attitudes, Nutritional Knowledge Levels, and Overweight and Obesity Among University Students: A Single-Center Study in Türkiye

Üniversite Öğrencileri Arasında Düzensiz Yeme Tutum Riski ve Beslenme Bilgi Düzeyinin Fazla Kilo ve Obezite İle İlişkisi: Türkiye'de Tek Merkezi Bir Çalışma

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ABSTRACT

Objective: This study aimed to examine the relationship between irregular eating attitudes and nutritional knowledge levels and obesity and overweight of university students studying at a university in Türkiye.

Materials and Methods: A three-part survey, consisting of socio-demographic information, the Eating Attitude Test-26, and the Nutrition Knowledge Scale, was applied. After the survey, the height and weight of all participants were measured. It was aimed to reach all students, but the survey form was applied to 628 students in total.

Results: The male students had higher average weight, height, and body mass index (BMI) values than the female students. The Eating Attitude Test-26 (EAT-26) score was significantly higher in the female students. The study showed that among the male students who were overweight and obese in terms of BMI, the probability of exceeding the EAT-26 cut-off limit was 4.25 times higher (OR=4.25 [1.38-7.33], p<0.001). Among the female students who were overweight and obese in terms of BMI, the probability of exceeding the EAT-26 cut-off limit was 3.92 times higher (OR=3.92 [2.44-8.04], p<0.001).

Conclusions: Disordered eating attitudes and poor nutritional knowledge levels were more common among those students who were overweight or obese.

Keywords: Eating disorders, nutritional knowledge, obesity, overweight, university students

ÖZ

Amaç: Bu çalışmada, Türkiye'de bir üniversitede öğrenim gören üniversite öğrencilerinin düzensiz yeme tutumları, beslenme bilgi düzeyleri ile fazla kilo ve obezite arasındaki ilişkinin incelenmesi amaçlanmıştır.

Materyal ve Metot: Sosyodemografik bilgiler, Yeme Tutum Testi-26 (YTT-26) ve Beslenme Bilgi Ölçeği'nden (BBÖ) oluşan üç bölümden oluşan bir anket uygulandı. Anketin ardından tüm katılımcıların boy ve kiloları ölçüldü. Tüm öğrencilere ulaşılması hedeflenmiş ancak anket formu toplamda 628 öğrenciye uygulanmıştır.

Bulgular: Erkek öğrencilerin ortalama ağırlık, boy ve beden kitle indeksi (BKI) değerleri kız öğrencilere göre daha yüksekti. EAT-26 puanı kız öğrencilerde anlamlı olarak yüksekti. Çalışma, BKI açısından fazla kilolu ve obez olan erkek öğrencilerde YTT-26 kesme sınırını aşma olasılığının 4,25 kat daha yüksek olduğunu gösterdi (OR=4,25 [1,38-7,33], p<0,001). BKİ açısından fazla kilolu ve obez olan kız öğrencilerde EAT-26 kesme sınırını aşma olasılığı 3,92 kat daha fazladır (OR=3,92 [2,44-8,04], p<0,001). BKİ açısından fazla kilolu ve obez olan kız öğrencilerde beslenme bilgi düzeyi 0,83 kat daha yüksekti (OR=0,83 [0,44-1,18], p=0,711).

Sonuç: Aşırı kilolu veya obez olan öğrencilerde düzensiz yeme tutumları ve zayıf beslenme bilgisi düzeyleri daha yaygındı.

Anahtar Kelimeler: Beslenme bilgisi, fazla kilo, obezite, üniversite öğrencileri; yeme bozukluğu

INTRODUCTION

Obesity is one of the most important public health issues affecting the whole world today.[1] Although the etiopathogenesis of obesity has not been clearly defined, it is stated that age, income status, sociocultural factors, metabolic disorders, endocrine problems, and psychological problems have direct or indirect effects on the development of obesity.[2,3] Studies found that genetic predisposition and environmental conditions played an important role in the etiology of obesity.[4,5] Recent studies associated obesity and overweight with disordered eating attitudes and nutritional knowledge level.[6,7]

The prevalence of eating disorders is increasing in developed and developing countries, especially among young people.[8] University students, in particular, are the most commonly vulnerable group with disordered eating attitudes and behaviors.[9] Many of this age group are away from home and starting university education during this period of their lives, which increases the likelihood of many mental and behavioral disorders.[10] According to the American Psychological Association, eating disorders are defined as abnormal eating habits that can threaten people's health and even life.[11] Many people who cannot control their eating have overweight and obesity problems. Nutritional knowledge is an important tool to have healthy eating habits and to make food choices healthier. Basically, this situation is based on the Knowledge-Attitude-Behavior model.[12,13] Various study results using anthropometric measurements, such as body mass index (BMI), show that nutritional information is associated with obesity and cardiovascular disease risk.[14] In particular, education level is one of a number of factors that influence nutrition knowledge. Additionally, nutrition knowledge and attitude are interrelated, and both play a key role in influencing nutritional behavior.[15]

This study aimed to examine the relationship between irregular eating attitudes and nutritional knowledge levels and obesity and overweight of university students studying at a university in Türkiye.

MATERIALS AND METHODS

Ethical Considerations: The study was carried out by the Helsinki Declaration. For this study, permission was obtained from the Non-Interventional Clinical Research Ethics Committee of Gazi University (Date:10.01.2023, decision no: 2023 - 68). In addition, verbal permission was obtained from the participants.

Setting and Sample: This cross-sectional study was conducted with the students of the health sciences faculty of a foundation university in Ankara. There were 1217 students in total, and the sample selection method was not used. It was aimed to reach all students, but the survey form was applied to 628 students in total (participation rate %51.60). Women tend to favor health science faculties due to popular departments such as nursing and midwifery. Therefore, the number of female participants was higher in our sample group (66.5%). The survey was applied face-to-face between May and June 2023.

Data Collection: The data were collected by the researchers using a structured survey consisting of socio-demographic features, the Eating Attitude Test -26, and the Nutrition Knowledge Scale.

Eating Attitude Test-26 (EAT-26): The Turkish validity study of the scale developed by Garner et al. (1976) was carried out by Ergüney Okumuş and Sertel Berk (2016), and the Cronbach's Alpha was 0.75.[16] This scale consists of 26 items under three factors: bulimia and food preoccupation, dieting, and oral control. Except for item 26 (reverse scoring), 'always', 'usually' and 'often' were given 3, 2, and 1 points, respectively, and 0 points were given for 'sometimes', 'rarely' and 'never'. Therefore, the total score can vary between 0 and 78. An increase in the mean score indicates risky eating behavior. An individual with a score of ≥ 20 was classified as "at risk" for disordered eating attitudes and "non-risk" if below 20.[17]

Nutrition Knowledge Scale (NKS): The scale items developed by Öngün Yılmaz et al. are scored between 0 and 4 (strongly agree 4 and strongly disagree 0 points). 10 items of the scale (1, 5, 6, 9, 10, 16, 17, 21, 27, 28) are reverse scored because they represent false information about nutrition. The highest score that can be obtained from the scale, which is evaluated over the total score, is 126. It is evaluated that as the score obtained from the scale increases, the level of nutritional knowledge increases, and as the score decreases, the level of nutritional knowledge decreases. The Cronbach alpha value is 0.851. The mean NKS score is 77.89 ± 10.23. Scores above this value are defined as a good nutritional knowledge level, and scores below this value are defined as a poor nutritional knowledge level.[18]

The researchers took anthropometric measurements and measured the participants' weight and height. Digital 100 gram sensitivity scales were used in the measurements. The height was measured according to the Frankfurt plane position with the head upright, eyes and ears parallel to the floor, legs straight and closed, arms at the sides, shoulders relaxed, and the heels, hips and shoulders against the wall. A non-stretch tape measure was used to determine the height. It took an average of 20 minutes for the participants to fill in the data collection form and realize the relevant measurements.

In defining obesity, the obesity classification of the WHO on the basis of the BMI was used. The BMI

value was calculated by dividing the person's weight in kilograms by the square of his/her height in meters (kg / m²). Values <25 were considered average weight, values between 25-29.9 were considered overweight, and values ≥30 were considered obese.[19]

Statistical Analysis: Data were analyzed with SPSS 21.0. Correlation analysis was performed to examine the relationship between EAT-26, NKS and BMI. To obtain valid results from the data, the quality of the data was first examined. To this end, the effects of lost data and endpoint values were studied to determine data loss. Since there were no lost values, Z scores were calculated over the total points to determine the remaining values. With regards to the Z scores, it was determined that all of the scores were in the range of +3 and –3. Since the data set showed normal distribution, parametric tests were started. Independent t-tests were performed to determine differences between groups. The strength of the association between the dependent variables (nutrition knowledge, attitudes and behaviors in disordered eating) and BMI was measured using chi-square tests and logistic regression analysis with a 95% confidence interval. Statistical significance accepted p-value < of 0.05.

RESULTS

When Table 1, which includes some characteristics of the participants, is examined, the average weight, average height and BMI of the male students were found to be higher than those of the female students (p<0.001). The EAT-26 score was significantly higher in the female students (p<0.001). The mean age of the participants was 21.14±1.83.

When Table 2 is examined, 23.09% of the total participants were in the overweight/obese group (Males: 33.81%, Females: 17.70%). The EAT-26 score of 38.02% of the male participants who were overweight/obese in terms of BMI was above 20, whereas the EAT-26 score of 41.89% of the female participants who were overweight/obese in terms of BMI was above 20. The logistic regression analysis revealed that among the male students who were overweight and obese in terms of BMI, the probability of the EAT-26 cut-off was 4.25 times higher (OR=4.25 [1.38-7.33], p<0.001). Among the female students who were overweight and obese in terms of BMI, the probability of the EAT-26 cut-off was 3.92 times higher (OR=3.92 [2.44-8.04], p<0.001).

Table 1. Descriptive characteristics of the participants of the study.

Parameters	Male (n = 210)	Female (n = 418)	Total (n = 628)	p-value
Age (year)	21.03±1.91	21.22±1.78	21.14±1.83	0.341
Weight (kg)	74.24±11.72	56.97±9.42	62.76±10.97	0.000*
Height (cm)	178.88±6.12	164.82±5.42	168.20±5.73	0.000*
BMI (kg/m2)	23.32±3.57	20.99±3.51	22.08±3.54	0.000*
EAT-26 score	23.15±4.82	27.23±8.05	24.89±6..03	0.000*
NKS score	77.35±9.18	78.25±11.5	77.89±10.23	0.289

*: p value <0.001; BMI: Body mass index; EAT-26: Eating Attitude Test-26; NKS: Nutrition Knowledge Scale.

Table 2. Relationship between overweight/obesity and the risk of disordered eating attitudes and behaviors among participants.

Participants	Parameters	Total n (%)	ED risk n (%)	χ2 (df)	p-value	COR (95% CI)	p-value
All of BMI category	Non-overweight/obese	483 (76.91)	109 (22.90)	31.08 (1)	0.000	Reference	0.000
	Overweight/obese	145 (23.09)	58 (40.00)			3.51 (2.57–8.11)	
Males of BMI category	Non-overweight/obese	139 (67.19)	33 (23.74)	16.71 (1)	0.000	Reference	0.000
	Overweight/obese	71 (33.81)	27 (38.03)			4.25 (1.38–7.33)	
Females of BMI category	Non-overweight/obese	344 (82.30)	76 (22.09)	24.51 (1)	0.000	Reference	0.000
	Overweight/obese	74 (17.70)	31 (41.89)			3.92 (2.44–8.04)	

ED: Eating Disorder; COR: Crude Odds Ratio; CI: Confidence interval.

When Table 3 is examined, the NKS score of 42.25% of the male participants who were overweight/obese in terms of BMI was below 78, and the NKS score of 21.62% of the female participants who were overweight/obese in terms of BMI was below 78. The logistic regression analysis showed that the probability of exceeding the NKS cut-off limit was 2.70 times higher among the male students who were overweight and obese in terms of BMI' (OR=2.70 [2.01-5.23], p<0.001).

According to Table 4, there is a positive correlation between BMI and EAT-26 score at a low level; There is a moderately negative and significant relationship between BMI and NKS, and a highly negative and significant relationship between EAT-26 and NKS.

Table 3. Relationship between overweight/obesity and the risk of nutrition knowledge scale.

Participants	Parameters	Total n (%)	NKS risk n (%)	χ2 (df)	p-value	COR (95% CI)	p-value
All of BMI category	Non-overweight/	483	121	17.77 (1)	0.000	Reference	0.000
	Overweight/obese	145	46 (31.72)			2.54 (1.66–4.81)	
Males of BMI category	Non-overweight/ obese	139 (67.19)	42 (30.22)	5.71 (1)	0.000	Reference	0.000
	Overweight/obese	71 (33.81)	30 (42.25)			2.70 (2.01–5.23)	
Female of BMI category	Non-overweight/ obese	344 (82.30)	79 (22.96)	0.88 (1)	0.857	Reference	0.711
	Overweight/obese	74 (17.70)	16 (21.62)			0.83 (0.44-1.18)	

NKS: Nutrition Knowledge Level; COR: Crude Odds Ratio; CI: confidence interval.

Table 4. Relationship between body mass index, eating attitude test-26 and nutrition knowledge scale.

		BMI	EAT-26
BMI	r	1	
	p		
EAT-26	r	0.391	1
	p	0.000	
NKS	r	-0.547	-0.757
	p	0.000	0.000

DISCUSSION AND CONCLUSION

This study examined the relationship between university students' disordered eating attitudes and nutritional knowledge levels and overweight and obesity. The findings revealed that almost a quarter of the university students in the study group were overweight and obese, and that this rate was higher in males. According to the report of the Turkish Statistical Institute, 55.2% of women and 57.0% of men living in Türkiye are in the overweight/obese group.[20] Since the average age of Türkiye is higher than the average age of university students, these rates may have been high. An increase in abdominal adipose tissue and fat accumulation in skeletal muscle are observed with advancing age.[21] In the study conducted by Sa et al. with university students in the United States, it was seen that about a quarter of participants were obese and that this rate was higher in men than in women. In the study of Tapera et al. conducted with university students in Botswana, the prevalence of overweight and obesity was found to be 37.8%, and the overweight and obese ratio of male students was higher than that of females.[22] Such inconsistency in prevalence estimates may be related to differences in sociocultural environments across countries. Thus, sociocultural, environmental, and psychological mechanisms associated with gender norms contribute to differences in obesity prevalence between men and women. There are region-specific customs, norms, and beauty standards that influence eating and physical activity behaviors.[23]

There are also gendered food preferences shaped by the sociocultural environment, such as women being more likely to prefer and consume foods high in sugar; This may be partly related to the gender targeting of food advertisements and the portrayal of certain foods as masculine or feminine.[23] Previous studies reported that female gender was typically associated with a higher likelihood of disordered eating.[6,24] In this context, our study supported the

literature, and the disordered eating score was higher in the female participants. At the same time, in our study, a positive relationship was found between eating attitude score and BMI. Therefore, the worse the eating attitudes and behaviors of university students, the greater the risk of becoming obese or overweight.

The participants with a high disordered eating score were found to be 3.5 times more likely to be overweight and obese. This rate was 4.25 times for the male participants and 3.92 times for the female participants. In this case, we can say that eating disorders affect men the most. The high rate of obesity in male participants in our study may be due to eating disorders. In the study conducted by Piko et al. with Hungarian university students, it was found that high disordered eating scores increased the risk of obesity 1.11 times.[24] In a study by Musaiger et al. on adolescents in seven Arab countries, excluding women in Kuwait and men in Palestine, obese adolescents had a disordered eating score and were two to three times more likely to be obese in both genders. In the same study, Libyan adolescents showed the highest association with obesity in both genders (OR = 3.54, 1.81-6.91, 95% CI and OR = 3.07, 1.88-5.03, 95% CI for males and females, respectively).[25] The fact that unhealthy eating habits are more common among college students can be attributed to students' greater exposure to junk food, inability to prepare healthy meals, irregular lifestyle, high alcohol consumption, and body image concerns. Incidences of eating disorders and food addiction are also higher among these individuals, as well as the risk of obesity.[26]

Nutritional knowledge, one of the factors affecting food choices, positively affects the adoption of healthy eating habits and reduces the risk of obesity.[27] Nutritional knowledge level can also be associated with anthropometric measures of obesity. Studies using anthropometric measurements found that nutritional knowledge was associated with BMI and waist circumference, which are indicators of comorbidities such as obesity and cardiovascular diseases.[28,29] This research supports the literature, and the risk of being overweight and obese was 2.54 times higher in the participants with low nutritional knowledge, and this risk was 2.70 times in the male participants. Additionally, as a result of the correlation test conducted in our study, a positive relationship was detected between BMI and nutrition knowledge level. According to Miller et al., when individuals receive accurate information about what they should eat and know the health effects of food consumption, they will modify their diets appropriately.[30] This study shows that inadequate nutrition knowledge triggers obesity.

Because of the cross-sectional design of the study, no causal relationship can be established, and the use of a self-reported questionnaire to examine attitudes toward eating disorders and knowledge of nutrition allows for some degree of self-report bias. Another limitation is that this study was conducted in a single center. Longitudinal studies with multicenter and large samples would be useful to establish a stronger relationship between nutritional knowledge, eating disorders and obesity. The strength of the study was that the age range was narrow and focused only on the 18-22 age range. Another strength was that overweight/obesity and both nutritional knowledge level and eating disorder were examined.

In conclusion, this study revealed that a significant relationship between BMI and disordered eating attitudes and nutritional knowledge levels among university students in Türkiye. Disordered eating behaviours and inadequate knowledge of nutrition were more common among students who were overweight or obese. This finding underscores the need for more information and public health awareness of the factors that influence eating behaviours and knowledge of malnutrition in this population. Individuals should be educated interactively about healthy nutrition, and the increase in the nutritional knowledge level of individuals should be transformed into behavioral changes by developing relevant health policies.

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