

Evaluation of the relationship of intuitive eating behaviour between body mass index and waist circumference in university students

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ABSTRACT

Objective: This study was conducted to examine the relationship between intuitive eating behaviour, body mass index (BMI), and waist-hip circumference among university students. **Methods:** This study was conducted on 146 students studying at the Department of Nutrition and Dietetics of a foundation university on the European side of Istanbul in the 2020-2021 academic year. Socio-demographic characteristics, anthropometric measurements, and intuitive eating habits of the students were taken through an online questionnaire. Intuitive Eating Scale-2 (IES-2) was used to determine students' intuitive eating behaviour. **Results:** 146 students with a mean age of 20.64±1.69 participated in the study. 62.3% of the students were female and 37.7% were male. Intuitive eating scale total score mean ± standard deviation values were found to be 3.40±0.55. BMI mean ± standard deviation values were found to be 21.89±3.94 kg/m² while waist circumference mean ± standard deviation values were 69.78±9.32 cm. eating due to physical rather than emotional causes sub-dimension has a positive and significant correlation with the eating sub-dimension related to hunger and fullness signals, body-food choice congruity, and intuitive eating scale-total score. There is a significant and positive relationship between the eating sub-dimension related to hunger and fullness signals and the body-food choice congruity sub-dimension and the total score of the intuitive eating scale. A significant and positive correlation was found between the body-food choice congruity sub-dimension and the total score of the intuitive eating scale. Comparing the intuitive eating scale total scores and sub-dimensions according to BMI groups, there is a significant difference in the mean score of the body-food choice congruity sub-dimension according to the BMI classification. **Conclusion:** As intuitive eating increases in university students, the body mass index decreases.

Keywords: Eating behavior, waist circumference, body mass index

Üniversite öğrencilerinde sezgisel yeme davranışının beden kütle indeksi ve bel çevresi arasındaki ilişkinin değerlendirilmesi

ÖZET

Amaç: Bu araştırma, üniversite öğrencilerinde sezgisel yeme davranışının beden kütle indeksi (BKİ), bel-kalça çevresi arasındaki ilişkinin incelenmesi amacıyla yapılmıştır. **Yöntem:** Bu araştırma 2020-2021 Eğitim-Öğretim yılında İstanbul Avrupa yakasında bir vakıf üniversitesinin Beslenme Diyetetik Bölümünde okuyan 146 öğrenci üzerinde gerçekleştirilmiştir. Öğrencilerin sosyo-demografik özellikleri, antropometrik ölçümleri ve sezgisel yeme alışkanlıkları online anket yoluyla alınmıştır. Öğrencilerin sezgisel beslenme davranışının saptanması için Sezgisel Yeme Ölçeği-2 (IES-2) kullanılmıştır. **Bulgular:** Çalışmaya yaş ortalaması 20.64±1.69 yıl olan 146 öğrenci katılmış olup öğrencilerin %62.3 kadın, %37.7 erkektir. Sezgisel yeme ölçeği toplam puan ortalaması±standart sapma değerleri 3.40±0.55'dir. BKİ ortalaması±standart sapma değeri 21.89±3.94 kg/m²'dir. Bel çevresi ortalaması±standart sapma değeri 69.78±9.32 cm'dir. Duyusal nedenlerden çok fiziksel nedenlere bağlı yemek alt boyutu ise Açlık ve tokluk sinyallerine bağlı yemek alt boyutu, vücut-besin seçim uyumu ve sezgisel yeme ölçeği-toplam puan ile pozitif ve anlamlı korelasyona sahiptir. Açlık ve tokluk sinyallerine bağlı yemek alt boyutu ile vücut-besin seçim uyumu alt boyutu ve sezgisel yeme ölçeği toplam puanı arasında anlamlı ve pozitif ilişki vardır. Vücut-besin seçim uyumu alt boyutu ve sezgisel yeme ölçeği toplam puanı arasında anlamlı ve pozitif korelasyon bulunmuştur. Sezgisel yeme ölçeği toplam puanları ve alt boyutlarının BKİ sınıflarına göre karşılaştırılmasında vücut-besin seçim uyumu alt boyutu puan ortalamasında ise BKİ sınıflamasına göre anlamlı bir fark vardır. **Sonuç:** Üniversite öğrencilerinde sezgisel beslenme arttıkça beden kütle indeksi azalmaktadır.

Anahtar kelimeler: Yeme davranışı, bel çevresi, beden kütle indeksi

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INTRODUCTION

The reasons for the unhealthy diets of university students are based on many reasons such as not knowing which food healthy and which food is unhealthy, products are expensive, and they have difficulty in preparing meals. It has been observed that university students, who are in the transition from adolescence to young adulthood, have difficulties in maintaining healthy eating behaviors with the increase of independence.¹ It is observed that the tendency to consume fast food has increased in university students and therefore the consumption of additional sugar, processed meat, and trans-fat is higher than the recommended daily intake.¹ Eating irregular, insufficient, or too much food, but not getting enough healthy food we need daily and consuming foods and beverages that are low in fiber and high in sugar are among the unhealthy eating behaviors. In this way, the energy and nutrients required to be consumed cannot be taken and many health problems may arise for this reason.²

The basic conditions of intuitive eating are the unconditional permit of the person to eat the food he wants when he is hungry, eating based on physiological rather than emotional causes, and relying on hunger-fullness symptoms to decide when and how much to eat.³

Intuitive eating is known to encourage the adoption of healthy behaviors and reduce the risk of irregular eating, regardless of weight status.⁴ One study found that the relationship between intuitive eating behavior and BMI was inversely proportional. Besides, it is known that people who practice intuitive nutrition have increased self-esteem, and this is because they trust their own hunger and fullness signals and nourish them.³

This study was conducted to evaluate the relationship between intuitive eating behavior, BMI, and waist-hip circumference in university students.

METHODS

This research is a cross-sectional study and was conducted on 146 students studying of a foundation university Faculty of Health Sciences, Department of Nutrition and Dietetics in 2020-2021. The population of the study consists of 200 students of the Department of Nutrition and Dietetics in 2020-2021. The sample of the study is 146 students who voluntarily agreed to participate in the study. The demographic, anthropometric measurements and intuitive eating behaviors of the students participating in the study were collected by the questionnaire method which consists of 33 questions developed by the researchers. Intuitive eating scale was used to measure eating behavior according to intuitive eating and hunger fullness signals. The intuitive eating scale was first

developed and tested by Hawks, Merrill, and Madanat. However, it did not provide sufficient reliability in his retests.⁶ In the original intuitive eating scale, Tylka collected 21 items in three subgroups.⁷ Tylka and Kroon developed the Van Diest intuitive eating scale-1 and created the Intuitive Eating Scale-2.⁸ Intuitive Eating Scale-2 adapted to Turkish by Baş and friends (2017) (Cronbach α coefficient: 0.82).⁹ The source used in the analysis of the data SPSS for Windows.¹⁰

For the study to be carried out, approval was obtained from the Ethics Committee of Istanbul Kültür University (Decision number: 2019.17).

RESULTS

In this part of the study, the descriptive information of the research group, the mean, standard deviation, minimum and maximum values of the variables by sex, the correlations between the variables, the Intuitive Eating Scale sub-dimensions according to sex and BMI classification, and t-test and Kruskal Wallis Test results are given to compare the total scores. In the study group, there are 91 women (62.3%), 55 men (37.7%), a total of 146 people. Mean age and standard deviation values for women, men, and the whole group are 20.74 ± 1.79 , 20.49 ± 1.51 , and 20.64 ± 1.69 respectively.

In Table 1, BMI and disease presence classification by sex is given. Accordingly, it is seen that women, men, and the whole group predominantly have normal BMI. 65.9% of women, 65.5% of men, and 65.8% of the whole group have normal BMI values. In this study, it is seen that women, men, and the whole group mostly do not have any disease. 9.9% of women, 21.8% of men, and 14.4% of the whole group have a disease.

Table 1. BMI and disease presence classification according to sex

BMI	Women		Men		Total	
	n	%	n	%	n	%
Thin	12	13.2	9	16.4	21	14.4
Normal	60	65.9	36	65.5	96	65.8
Overweight	15	16.5	8	14.5	23	15.8
Obese	4	4.4	2	3.6	6	4.0
Total	91	100	55	100	146	100
Disease						
Have	9	9.9	12	21.8	21	14.4
Don't have	82	90.1	43	78.2	125	85.6
Total	91	100	55	100	146	100

Mean, standard deviation, minimum and maximum values of the variables according to sex are given in Table 2. The Intuitive Eating Scale total score mean \pm

Table 2: Mean, standard deviation, minimum and maximum values of variables according to sex

Variables	Women				Men				Total			
	Mean	SD.	Min.	Max.	Mean	SD.	Min.	Max.	Mean	SD.	Min.	Max.
Unconditional permission to eat	3.19	0.73	1.00	5.00	3.06	0.59	2.00	5.00	3.15	0.68	1.00	5.00
Eating for physical rather than emotional reasons	3.52	0.90	1.00	5.00	3.37	0.91	1.50	5.00	3.46	0.90	1.00	5.00
Reliance on hunger and satiety cues	3.48	0.92	1.00	5.00	3.48	0.84	1.00	5.00	3.48	0.89	1.00	5.00
Body-food choice congruence	3.61	1.04	1.00	5.00	3.46	0.90	1.00	5.00	3.55	0.99	1.00	5.00
Intuitive Eating Scale - Total Score	3.44	0.58	1.95	4.69	3.33	0.50	2.04	4.56	3.40	0.55	1.95	4.69
BMI	21.63	3.91	15.81	36.41	22.33	3.98	16.83	37.12	21.89	3.94	15.81	37.12
Waist circumference	67.52	8.32	56.00	96.00	73.52	9.73	49.00	100.00	69.78	9.32	49.00	100.00

standard deviation values are 3.44 ± 0.58 for women, 3.33 ± 0.50 for men, and 3.40 ± 0.55 for the total group. BMI value was found as 21.63 ± 3.91 , 22.33 ± 3.98 , and 21.89 ± 3.94 for women, men, and the whole group, respectively. Waist circumference is 67.52 ± 8.32 for women, 73.52 ± 9.73 for men, and 69.73 ± 9.32 for the whole group.

The correlation and significance values between variables are shown in Table 3. Unconditional eating permission subscale, with the Intuitive Eating Scale-total score ($p < 0.01$), was positive and significant; it has a negative and significant relationship with BMI and waist circumference ($p < 0.05$). As the scores of the unconditional eating permission sub-dimension increase, the total scores from the Intuitive Eating Scale increase and BMI and waist circumference decrease. Eating for physical reasons rather than emotional reasons sub-dimension has a positive and significant correlation with the sub-dimensions of reliance on hunger and fullness cues, body-food choice congruity ($p < 0.01$), and intuitive eating scale-total

score ($p < 0.05$). There is a significant and positive relationship between reliance on hunger and fullness cues sub-dimension and the body-food choice congruity sub-dimension and the total score of the intuitive eating scale ($p < 0.01$). A significant and positive correlation was found between the body-food choice congruity sub-dimension and the total score of the intuitive eating scale ($p < 0.01$). In addition, a significant and positive relationship was found between BMI and waist circumference ($p < 0.01$). Other relationships between variables are insignificant ($p > 0.05$).

The comparison of the intuitive eating scale total scores and sub-dimensions according to sex is given in Table 4. It was determined that sub-scales of unconditional eating permission, eating for physical reasons rather than emotional reasons, reliance on hunger and fullness cues, body-food choice congruity, and the total score averages of the Intuitive Eating Scale did not differ according to sex ($p > 0.05$).

Table 3. Correlations between variables

	Unconditional permission to eat (rho; p)	Eating for physical rather than emotional reasons (rho; p)	Reliance on hunger and satiety cues (rho; p)	Body-food choice congruence (rho; p)	Intuitive Eating Scale - Total Score (rho; p)	BMI (rho; p)	Waist circumference (rho; p)
Unconditional permission to eat							
Eating for physical rather than emotional reasons	-0.067						
	0.423						
Reliance on hunger and satiety cues	-0.008	0.426					
	0.920	<0.001					
Body-food choice congruence	-0.125	0.341	0.473				
	0.134	<0.001	<0.001				
Intuitive Eating Scale - Total Score	0.253	0.806	0.770	0.586			
	0.002	<0.001	<0.001	<0.001			
BMI	-0.193	0.040	-0.110	0.071	-0.069		
	0.020	0.628	0.187	0.395	0.408		
Waist circumference	-0.164	-0.087	-0.089	0.102	-0.116	0.605	
	0.047	0.299	0.284	0.220	0.163	<0.001	

Table 4. Comparison of the intuitive eating scale total scores and sub-dimensions by sex

Factors	Sex	n	Mean	SD	t Test		
					t	sd	P
Unconditional permission to eat	Women	91	3.19	0.73	1.63	131.94	0,24
	Men	55	3.06	0.59			
Eating for physical rather than emotional reasons	Women	91	3.52	0.90	0.97	112.99	0,33
	Men	55	3.37	0.91			
Reliance on hunger and satiety cues	Women	91	3.48	0.92	-0.01	121.91	0,99
	Men	55	3.48	0.84			
Body-food choice congruence	Women	91	3.61	1.04	0.95	127.2	0,35
	Men	55	3.46	0.90			
Intuitive Eating Scale - Total Score	Women	91	3.44	0.58	1.16	127.63	0,25
	Men	55	3.33	0.50			

The comparison of the intuitive eating scale total scores and sub-dimensions according to BMI classifications is shown in Table 5. There was no significant difference in the sub-scales of unconditional eating permission, eating for physical reasons rather than emotional reasons, reliance on hunger and fullness cues, and the total score averages of the Intuitive Eating Scale between underweight, normal, overweight, and obese individuals ($p>0.05$). There is a significant difference in the mean score of the Body-food choice congruity

sub-dimension according to the BMI classification ($p<0.05$). According to the comparison analysis, the mean scores of the body-food choice congruity sub-dimension of the overweight group were found to be significantly higher than the average scores of the underweight, normal weights, and obese group ($p<0.05$). The other groups did not differ in the mean scores of the Body-food choice congruity sub-dimension ($p>0.05$).

Table 5. Comparison of the intuitive eating scale total score and sub-dimensions to BMI classifications

Factors	Group	n	Mean	X^2	sd	P
Unconditional permission to eat	Thin	21	79.85	4.78	3	0.19
	Normal	96	76.07			
	Overweight	23	64.54			
	Obese	6	44.33			
Eating for physical rather than emotional reasons	Thin	21	84.90	5.66	3	0.13
	Normal	96	67.51			
	Overweight	23	84.58			
	Obese	6	86.91			
Reliance on hunger and satiety cues	Thin	21	74.54	2.13	3	0.55
	Normal	96	74.56			
	Overweight	23	74.50			
	Obese	6	48.91			
Body-food choice congruence	Thin	21	70.07	13.40	3	0,00*
	Normal	96	68.59			
	Overweight	23	102.06			
	Obese	6	54.41			
Intuitive Eating Scale – Total Score	Thin	21	81.57	4.15	3	0.25
	Normal	96	70.20			
	Overweight	23	84.73			
	Obese	6	54.83			

$p < 0.05^*$

DISCUSSION

This study was conducted to examine the relationship between intuitive eating behavior, BMI, and waist-hip circumference in university students.

The basic logic of intuitive nutrition is to correctly interpret the instinctive feedback on the content and volume of the required consumption of food and eating in accordance with these. For this reason, it was thought to be related to BMI and waist circumference.¹¹

In the study conducted by Kuseyri and Kızıltan on university students studying at the Faculty of Health Sciences, it was found that intuitive eating behavior could be effective on nutrition.¹²

In the study involving individuals between the ages of 19-45, the Unconditional eating permission sub-dimension and BMI and waist circumference were found to have a positive significant relationship. As the score of the unconditional eating permission subscale increases, BMI and waist circumference values also increase.¹³ In another study conducted with university students, no correlation was found between BMI and unconditional eating permission sub-dimension. However, a positive correlation was observed between BMI and eating for physical reasons rather than emotional causes. In addition, a negative correlation was observed between the total score of intuitive eating and BMI.¹⁴ In a large sample of French university students, a positive correlation was found between emotional eating and food addiction of 1051 students (76.3% female) in the study conducted by Bourdier et al.¹⁵ It has been reported that psychological distress is associated with emotional eating and food addiction and may cause increases in BMI. Therefore, it was concluded that among educated young adults, using food consumption to eliminate negative moods puts the person at risk of being overweight and obese. An inverse relationship between intuitive eating score and BMI was found depending on these subscales. In this study, the unconditional eating permission subscale was positive and significant with the intuitive eating scale total score while it has a negative and significant relationship with BMI and waist circumference. Based on this data, it is thought that there is a significant negative correlation between the intuitive eating scale total score and BMI and waist circumference.

In his study Bilici et al.¹⁶ the total score and subscales of the intuitive eating scale for women (excluding the score of reliance on hunger-fullness signals) were found to be significantly lower, and as a result, a significant difference between sexes was reported. In the study of Camilleri et al.⁵ women were lower compared to men. It has been observed that they have lower scores in the scales of having an intuitive eating total score and eating due to physical reasons rather than emotional causes and unconditional eating

permission. According to the literature, women have lower scores in the intuitive eating scale total scores compared to men. However, when looking at the subscales, the relationship between sex and subscales varies according to studies. In this study, it was found that the sub-dimensions and the intuitive eating scale total score averages did not differ according to sex. The intuitive eating scale scores of this sample of nutrition and dietetic students were higher than expected when compared with the literature. The fact that the sample is mainly female, and the sample size is small may cause it to be inconsistent with the literature.

In the study conducted by Saunders et al.¹⁷ in a sample of 482 Hispanic American university students, people with normal BMI are among the sub-scales of intuitive eating; It has been observed that trusting hunger and fullness signs, body-food choice congruity, eating for physical reasons rather than emotional reasons gets significantly higher scores than obese individuals. The unconditional eating permission subscale could not be repeated in the current sample. As a result, it has been found that people with normal BMI have higher intuitive eating scores than slightly fat and obese individuals.¹⁷ In this study, there is also a positive correlation between the eating subscale due to physical rather than emotional causes and the total score of the intuitive eating scale. Anderson et al.¹⁸, showed that an increase in intuitive eating scores was associated with lower BMI and decreased irregular eating. Ruzanska et al.¹⁹ conducted a study with 532 participants aged 18-91 showed that low and average weight participants had higher intuitive eating total scores than participants who were overweight and obese. In this study, a significant relationship between body-food choice congruity sub-dimension mean score and BMI was found. According to the comparative analysis, the body-food choice congruity sub-dimension mean scores of the overweight group were found to be significantly higher than the mean scores of the underweight, normal weights, and obese group.

The reasons for its difference with the literature is thought to be due to the small sample size and to be that the study was conducted on nutrition and dietetics students.

Limitations of the Study

The fact that a foundation university's Faculty of Health Sciences has been continuing education and training for 4 years and, consequently, the number of students is low and female students are predominant are among the limitations of this study. One of the limitations of this study is that there are no additional scales such as emotional eating scale or eating awareness in order to understand the reason for the differentiation of sexes more clearly.

CONCLUSION

As a result, there is an inverse relationship between intuitive eating behavior and body mass index, and waist circumference. As the intuitive eating behavior increases, body mass index and waist circumference decrease. Intuitive eating behavior may contribute to the reach normal body weight according to this situation. More studies are needed to understand the effects of intuitive eating behavior on body weight.

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