Alınış / Received: 05.02.2025 Kabul / Accepted: 19.01.2026 Online Yayınlanma / Published Online: 20.04.2026
Araştırma Makalesi / Research Article DOI: 10.22312/sdusbed.1633806

Süleyman Demirel Üniversitesi Sağlık Bilimleri Dergisi
Suleyman Demirel University Journal of Health Sciences

Relationship Between Eating Behaviors, Nutritional Status and Obesity in Adult Women

Yetişkin Kadınlarda Yeme Davranışlarının Beslenme Durumu ve Obezite ile İlişkisi

Seyit Ramazan KARADOĞAN [1]*, Funda Pınar ÇAKIROĞLU [2]

[1]Egirdir State Hospital, Isparta, Turkey
[2]Ankara University, Department of Nutrition and Dietetics, Faculty of Health Sciences, Ankara, Turkey
* Corresponding author: s.karadogan67@gmail.com

ABSTRACT

The aim of this study was to examine the relationship between eating behaviors and energy intake, macronutrients and body mass index in adult women. The study sample consisted of 205 women aged between 19-64 who attended the Healthy Life Center in Sandıklı district of Afyonkarahisar province. Within the scope of the study, anthropometric measurements of the participants, 3-day food consumption records (2 on weekdays and 1 on weekends) were taken, and the Dutch Eating Behavior Scale, which was adapted to Turkish by Bozan in 2009, was applied to the participants. The analysis revealed that increased daily energy, fat, protein and carbohydrate intake were positively associated with higher emotional eating behavior scores and external eating behavior scores, negatively associated with restrictive eating behavior scores ($p<0.05$). Additionally, a higher percentage of energy intake from fat was related to increased restrictive eating behavior scores, while a higher percentage of protein intake was associated with lower external eating behavior scores ($p<0.05$). Furthermore, women with higher restrictive eating behavior scores showed decreases in anthropometric measurements, whereas those with higher emotional and external eating scores exhibited increases in these values ($p<0.05$). According to these results, obesity was found to be associated with eating behaviors. In interventions targeting obesity, psychological factors must be elaborated as much as medical nutrition therapy. In this process, it can be said that behavioral change interventions regarding eating behaviors are important. Therefore, it may be considered that it may be easier to prevent and control obesity.

Keywords: *Emotional eating behavior, External eating behavior, Macronutrients, Obesity, Restrictive eating behavior*

ÖZ

Bu çalışmanın amacı, yetişkin kadınlarda yeme davranışları ile enerji, makro besinler ve beden kütle indeksi arasındaki ilişkiyi araştırmaktır. Bu çalışmanın örneklemini Afyonkarahisar ili Sandıklı ilçesinde bulunan Sağlıklı Yaşam Merkezi'ne kayıtlı 19-64 yaş aralığı 205 kadın oluşturmuştur. Çalışma kapsamında katılımcıların antropometrik ölçümleri, hafta içi 2 ve hafta sonu 1 gün olacak şekilde 3 günlük besin tüketim kayıtları alınmış ve katılımcılara 2009 yılında Bozan tarafından Türkçe'ye kazandırılan Hollanda Yeme Davranış Ölçeği uygulanmıştır. Yapılan analizler sonucunda, çalışmadaki katılımcıların günlük tükettikleri enerji, yağ, protein ve karbonhidrat miktarı arttıkça duygusal yeme davranış puanları ve dışsal yeme davranış puanlarının arttığı, kısıtlayıcı yeme davranış puanlarının ise azaldığı görülmüştür ($p<0.05$). Günlük alınan enerjinin yağ yüzdesi arttıkça kısıtlayıcı yeme davranış puanlarının da arttığı, protein yüzdesi arttıkça dışsal yeme davranış puanlarının ise azaldığı saptanmıştır ($p<0.05$). Ayrıca kısıtlayıcı yeme puanları yüksek olan kadınların antropometrik ölçüm değerlerinde azalma gözlenirken, duygusal yeme davranışı puanları ve dışsal yeme davranışı puanları yüksek olan kadınlarda artışlar tespit edilmiştir ($p<0.05$). Bu sonuçlara göre obezitenin yeme davranışarıyla ilişkili olduğu görülmüştür. Obeziteye yönelik müdahalelerde tıbbi beslenme tedavisi kadar psikolojik faktörlerin de üzerinde durulması gerekmektedir. Bu süreçte yeme davranışlarına ilişkin davranış değişikliği müdahalelerin önemli olduğu söylenebilmektedir. Dolayısıyla obezitenin önlenmesi ve kontrol altına alınmasının daha kolay olabileceği düşünülebilir.

Anahtar Kelimeler: *Dışsal yeme davranışı, Duygusal yeme davranışı, Kısıtlayıcı yeme davranışı, Makro besinler, Obezite*

INTRODUCTION

Obesity is regarded as one of the most critical health challenges in the 21st centuryand is becoming increasingly widespread and threatens human health. In the worldwide, obesity has almost tripled since 1975. According to the data of "World Health Organization (WHO)", more than 50% of women in Europe, the Mediterranean Regions and America are overweight, and approximately half of overweight women in all three regions are obese. It is also stated that women face a higher risk of obesity compared to men across all regions worldwide (1). According to the Turkey Health Survey 2022, the obesity rate in Turkey over the age of 15 is 20.2%. It was determined that 16.8% of men and 23.6% of women were obese (2). Thus, understanding the factors that contribute to the development of obesity has become important. Eating behavior is thought to be an important factor in the causes of obesity (3). Therefore, there has been increased interest in examining the factors that affect eating behavior in individuals and determining individual differences in psychological factors that affect obesity (4). Individual preferences and beliefs, traditions, environment, social and economic factors are related to acquired nutritional habits and eating behaviors (5). In addition to this, metabolic diseases (obesity, diabetes, hypertension, etc.), hormonal changes and emotional states also affect eating behavior (6). Eating behavior is not only an action taken to satisfy physiological hunger, but also it appears as a psychological desire because it is a social activity and changes in eating behavior may occur due to emotional states without physiological hunger (7). However, it is hard to present a broad evaluation about eating behaviors based on emotional states and basic characteristics of individuals (8).

Eating behaviors have many psychological sub-dimensions. The most important ones can be explained by emotional, restrictive and external eating behaviors and can affect the healthy eating and body weight cycle (9). Given that the physiological responses typically seen in response to negative emotions resemble those associated with satiety, which would usually lead to a decrease in food intake, the subsequent increase in food consumption is referred to as emotional eating (10). External eating refers to changes in food intake triggered by external cues, such as the sight or smell of food (11), while restrictive eating is characterized by the tendency to consume less food than desired in order to maintain body weight control (12). One of the scales that best describes these eating behaviors is the "Dutch Eating Behavior Questionnaire" (DEBQ). It's known that the external eating, emotional eating and restrictive eating subscales of the DEBQ areassociated with maladaptive eating behaviors, higher BMI, and negative emotional states (10).

It is considered important to focus on the social and psychological dimensions of eating behaviors, which are one of the most important causes of obesity, especially in women. Based on this point, the study was purposed to examine the relationship between eating behaviors and both dietary energy and macronutrients and BMI in women in Turkey.

MATERIAL and METHOD

Participants and Ethics

The research involved 260 women aged 19 to 64 who sought services at the Healthy Living Center, affiliated with the Turkish Republic Ministry of Health, located in the Sandıklı district of Afyonkarahisar province. The participants did not have a psychological problem, did not use antidepressants, were not pregnant or breastfeeding, and they were volunteers to participate in the study. The study excluded 55 women due to incomplete food consumption records, resulting in a final sample of 205 participants. In determining the sample size, the G Power 3.1.9.2 Package program was used; it was determined that at least 200 individuals should be included in the study at 80% power and a 0.05 error level (13). Approval for the research was acquired from the Ethics Board of Ankara University and Afyonkarahisar Provincial Health Directorate Public Hospitals Presidency Scientific Research Requests Evaluation Commission.

Data Collection

Dutch Eating Behavior Scale (DEBQ)

The scale was adapted to Turkish by Bozan in 2009. The internal consistency coefficients of Turkish from were found to be 0.97 on the emotional eating subscale, 0.91 on the restrictive eating subscale

and 0.90 on the external eating subscale. The scale consists of a total of 33 questions: 13 questions on emotional eating, 10 questions on restrictive eating, and 10 questions on external eating. The questions are structured as 5-point Likert scale items. The total score on the scale ranges from 33 to 165. There is no specific cut-off point for the test scoring and high scores in any sub-dimension indicate negativity related to that eating behavior (14).

Food Consumption Record

To assess the participants' food consumption habits, three daily food intake records were collected, including two weekdays and one weekend day. The first day of the food consumption record was filled in by the researcher by asking the participant with the method of reminder, and how to register was shown to the participant through demonstration. According to the consumption record, the amount of energy and nutrients taken daily was calculated using the "Computer-Aided Nutrition Program, Nutrition Information Systems" package program (BEBIS), which was developed for Turkey (15).

Anthropometric Measurements

Anthropometric measurements consisted of weight, height, waist and hip circumference. When measuring body weight, participants were called one day in advance and told to arrive the next day without breakfast, if possible, after defecating. At the time of measurement, the participant was asked to remove any thick clothes, such as coats and jackets, as well as belongings (e.g., wallet, keys, phone, shoes). The participants were measured standing upright and looking straight ahead without moving. Measurement was carried out with the CVS DN 1743 Digital Scale, taking into account 100 grams (g) sensitivity. The height of participants was measured after removal of the shoes. The head was kept in an upright positionduring measurement, while it was in the Frankfort plane, and a stadiometer at a sensitivity of 0.1 centimeters (cm) was used. BMI, which is an index based on body weight and height, defines obesity and the risk of obesity.BMI is calculated by dividing a person's weight in kilograms by the square of their height in meters. According to BMI values, individuals were defined as "<18.5= underweight; 18.5-24.9= normal; 25.0-29.9= overweight; 30.0-34.9= 1st degree obese; 35.0-39.9= 2nd degree obese and ≥40.0= 3rd degree obese" (16).

Waist circumference measurement in underweight individuals is from the point where the waist is most indented; In overweight individuals, the midpoint of the last rib and the highest point of the iliac crest were determined and the measurement was taken from this point. While taking measurements, individuals were taken standing upright and without any clothing around the waist. Measurements were taken with a tape measurein the hip circumference measurement, while the individual was standing and in an upright position, the researcher took the measurement by holding the tape measure parallel to the ground from the part of the trochanteric points of the femurs on the skin in front of the individual. The measurement was taken while the tape measure was parallel to the ground and stretched (17). The waist circumference value reflects the abdominal fat tissue. According to waist circumference measurements in women, <80 cm= low body weight-related health risk; >80-88 cm= high body weight-related health risk; >88 cm= body weight-related health risk defined as very high. Waist/hip ratio below 0.85 in women was considered as normal values in terms of body weight, and 0.85 and above was considered as an indicator of obesity (18). Waist/height ratio is also considered as an indicator of abdominal fat.Waist/height ratio is more sensitive than BMI in terms of health risk indicator and it is simpler to measure and evaluate. If the waist-height ratio is <0.5; non-central pear-type adiposity is mentioned, if it is >0.5; central apple-type adiposity is mentioned and if it is >0.6; central obesity is mentioned (19).

Statistical Analysis of Data

"The Statistical Package for Social Sciences 26.0" package program was used in the analysis of the data obtained in the research. In the evaluation of qualitative data, number (n) and percentage (%) and mean and standard deviation or median values of quantitative data were calculated. The normality distribution of continuous quantitative data was controlled by the "Kolmogorov-Smirnov

Test".“The Independent Samples T-test” was applied for comparing two independent groups when the normality assumption was fulfilled, while the “Mann-Whitney U test” was used when this assumption was not met. To compare more than two independent groups, the “One-Way ANOVA test” was applied for variables following a normal distribution, while the “Kruskal-Wallis variance analysis test” was employed for variables not conforming to normality. When the “One-Way Anova Test” was applied, “Hochbergs GT2 or Games Howell post hoc tests” were applied according to the “Levene's Test” results to determine the differences between more than two groups. In cases where “Kruskal-Wallis Variance Analysis Test” was applied, differences between more than two groups were determined by multiple comparisons under the “Kruskal-Wallis One-way ANOVA (k samples)”option. While examining the relationship between two quantitative variables, “Spearman correlation analysis” was performed between variables that did not appear to have a normal distribution. In addition, the relationship between two quantitative variables was determined by “Partial Correlation Analysis” by controlling one or more variables likely to affect these variables. The threshold for statistical significance was set at $p<0.05$; with a confidence interval of 95%.

RESULTS

The general characteristics of the participants are presented in Table 1. The great majority of participants are married (74.1%) and in the 31-50 age group (50.7%). The average age of the participants is 36.3±11.9 years. As a remarkable data, the participants stated that 84.4% were not satisfied with their body weight and 89.8% wanted to reduce or increase their body weight.

Table 1. General Characteristics of The Study Population

Variable	n (%)
Age Groups)	
19-30	72 (35.1)
31-50	104 (50.7)
51-64	29 (14.2)
Marital status	
Single	53 (25.9)
Married	152 (74.1)
Educational Status	
Illiterate	1 (0.5)
Primary school graduate	50 (24.4)
Secondary school graduate	29 (14.1)
High school graduate	53 (25.9)
Graduated from a university	72 (35.1)
Working Status	
Working	66 (32.2)
Not working	113 (55.1)
Retired	4 (2.0)
Student	22 (10.7)
Occupation (n=66)	
Officer	38 (57.6)
Employee	12 (18.2)
Self-employment	16 (24.2)
Are you satisfied with your body weight?	
No	173(84.4)
Yes	22 (10.7)
Undecided	22 (4.9)
Do you want to lose weight or gain weight?	
No	21 (10.2)
Yes	184 (89.8)

Data regarding the participants' dietary energy-macronutrient elements and anthropometric measurements are shown in Table 2. Participants received an average of 1659.4±469.0 kcal/day (22.3±5.9 kcal/kg) energy from their daily diet and it was determined that this energy consisted of 44.8±6.4% (2.5±0.8 g/kg) carbohydrates, 15.3±2.8% (0.8±0.2 g/kg) protein and 39.9±5.5% (1.0±0.3 g/kg) fat. When the anthropometric measurements of the participants were evaluated, according to the values of BMI, only 25.4% of them were within the normal range (18.5-24.9 kg/m2); according to waist circumference values, only 25.4% were within the normal range (<80 cm); the majority (75.6%) were within the normal range (<0.85) according to waist-hip ratio and only 27.8% were within the normal range (<0.5) according to waist-height ratio.

Table 2. Dietary Intakes and Anthropometric Measurements of Participants

Variable		**Mean (SD)**
Energy-Macro Nutrients Intake		
Energy (kcal)		1659.4±469.0
Energy (kcal/kg)		22.3±5.9
Carbohydrate (%)		44.8±6.4
Carbohydrate (g/kg)		2.5±0.8
Protein (%)		15.3±2.8
Protein (g/kg)		0.8±0.2
Fat(%)		39.9±5.5
Fat (g/kg)		1.0±0.3
Anthropometric Measurements		
BMI (kg/m^2)		29.9±5.9
Waist Circumference (cm)		88.1±12.1
Waist–Hip Ratio		0.80±0.06
Waist-Height Ratio		0.5±0.1
Classification		**n (%)**
BMI	**18.5-24.9**	52 (25.4)
	25.0-29.9	53 (25.9)
	30.0-34.9	50 (24.4)
	35.0-39.9	50 (24.4)
Waist Circumference	**<80**	52 (25.4)
	80-88	56 (27.3)
	>88	97 (47.3)
Waist/Hip Ratio	**<0.85**	155 (75.6)
	>0.85	50 (24.4)
Waist/Height Ratio	**<0.5**	57 (27.8)
	0.5-0.6	93 (45.4)
	>0.6	55 (26.8)

The relationship between participants' eating behaviors and anthropometric measurements is presented in Table 3. It was determined that as the restrictive eating scores of the participants increased, their BMI, waist circumference, waist-hip ratio and waist-height ratio declined. It is seen both in the differences between groups and in the partial correlation analysis. There is a weak negative correlation between restrictive eating score and BMI, waist circumference, waist-hip ratio and waist-height ratio (r:-0.24; r:-0.25; r:-0.14; r:-0.24). When emotional eating behavior, another eating behavior, is examined, it is found that as the emotional eating scores of the participants increase, BMI, waist circumference, waist-hip ratio and waist-height ratio increase. The significant increase observed between the groups was also reflected in the partial correlation analysis, there was a positive moderate difference between the emotional eating score and BMI and waist circumference (r:0.33; r:0.32) and a positive weak difference between the waist-hip and waist-height ratio (r:0.15; r:0.26) was observed. Finally, when the external eating scores of the participants were examined, the difference of external eating score and the BMI, waist circumference, waist-hip ratio and waist-height ratio of participants was not found. However, in the partial correlation analysis, a weak

positive relationship was determined between the participants' external eating score and BMI, waist circumference and waist-to-height ratio (r:0.23; r:0.21; r:0.18).

Table 3. The Relationship Between Eating Behaviors and Anthropometric Measurements

Variable		Restrictive eating score	Emotional eating score	External eating score
		Median(q1-q3)	Median(q1-q3)	Mean±SD
BMI (kg/m²)[w,v]	18.5-24.9	2.5[a**](1.8-3.0)	1.6[a**](1.2-3.1)	3.1±0.7
	25.0-29.9	2.5[ab**](1.9-3.1)	1.9[ac**](1.0-4.6)	2.8±0.8
	30.0-34.9	2.0[c**](1.4-2.5)	4.1[b**](1.6-4.7)	2.9±1.0
	35.0-39.9	2.0[ac**](1.7-2.6)	4.2[b**](2.1-4.7)	3.2±1.1
Waist [w,v]Circumference (cm)	<80	2.5[a*](1.8-3.1)	1.6[a**](1.2-3.8)	3.0±0.8
	80-88	2.4[ab*](1.8-3.0)	2.0[ab**](1.0-4.5)	3.0±0.9
	>88	2.0[c*](1.7-2.7)	4.2[c**](1.6-4.7)	3.0±1.8
Waist–Hip Ratio[y,z]	<0.85	2.2[a](1.7-3.0)	2.2[a*](1.2-4.7)	3.0±1.0
	>0.85	2.1[a](1.8-2.7)	4.1[b*](1.6-4.7)	3.0±1.1
Waist-Height Ratio[w,v]	<0.5	1.9[a*](1.2-2.1)	2..1[a*](1.0-4.7)	3.1±0.7
	0.5-0.6	2.6 [ab](2.0-3.1)	1.6[ab](1.2-3.6)	3.0±1.0
	>0.6	2.3 [b*](1.7-3.0)	2.6[b*](1.0-4.7)	3.0±1.0
		r p	r p	r p
BMI (kg/m²)[x]		-0.24 **0.000**[**]	0.33 **0.000****	0.23 **0.001**[*]
Waist Circumference (cm)[x]		-0.25 **0.000**[**]	0.32 **0.000**[**]	0.21 **0.002**[*]
Waist-Hip Ratio[x]		-0.14 **0.043**[*]	0.15 **0.034**[*]	0.08 0.270
Waist-Height Ratio[x]		-0.24 **0.001**[*]	0.26 **0.000**[**]	0.18 **0.011**[*]

*p<0.05 **p<0.001 a, b, c= There is a statistically significant difference between groups with different letters in the same column; w=One-Way Anova Test; v=Kruskal-Wallis Variance Analysis Test; y=Independent Samples T Test; z=Mann Whitney U Test; x=Partial Correlation Analysis was performed. The age variable was controlled.

When the relationship between eating behaviors and energy and macronutrients is evaluated; as the restrictive eating scores of the participants increased, the amount of energy (r:-0.33), carbohydrate (r:-0.34), protein (r:-0.26) that were received from diet was found to decrease and the fat percentage of daily energy increased (r:0.15) (p<0.05). As participants' emotional eating scores increase, the amount of energy (r: 0.19), carbohydrates (r: 0.15), protein (r: 0.21) and fat (r: 0.20) they get from the diet also increases (p<0.05). Also, as the participants' external eating scores increase, the amount of energy (r:0.25), carbohydrate (g/day and %) (r:0.27; r:0.17), protein (r:0.14) and yağ (r:0.17) they receive from the diet increases, while the percentage of energy coming from protein decreased (r:-0.15) (p<0.05). (Table 4.)

Table 4. Correlation Analysis, Eating Behaviors-Energy-Macro Nutrients Intake

Energy-Macro Nutrients Intake[w]	Restrictive eating score[w]		Emotional eating score[w]		External eating score	
	r	p	r	p	r	p
Energy (kcal/gün)	-0.33	**0.000**[**]	0.19	**0.006**[*]	0.25	**0.000**[**]
Carbohydrate (%)	-0.13	0.055	-0.06	0.423	0.17	**0.017**[*]
Carbohydrate (g/gün)	-0.34	**0.000**[**]	0.15	**0.039**[*]	0.27	**0.000**[**]
Protein (%)	0.03	0.656	0.05	0.493	-0.15	**0.032**[*]
Protein (g/gün)	-0.26	**0.000**[**]	0.21	**0.003**[*]	0.14	**0.047**[*]
Fat(%)	0.15	**0.031**[*]	0.03	0.636	-0.13	0.056
Fat (g/gün)	-0.23	**0.001**[*]	0.20	**0.005**[*]	0.17	**0.013**[*]

w=Spearman Correlation Analysis was performed. *p<0.05 **p<0.001

DISCUSSION

Turkey is one of the countries where obesity, which is described as a pandemic today, is most common. Therefore, this study was conducted to examine the relationship between eating behaviors and energy, macronutrients and BMI in women in Turkey. It can be stated that obesity was observed at a high rate among the women participating in the study. As stated in the literature, eating behaviors such as restrictive, emotional and external are identified as risk factors for obesity (20-23). A study

conducted on healthy adults found that obese individuals had higher emotional and external eating behavior scores compared to normal-weight individuals ($p<0.05$), while the difference in restrictive eating behavior scores was not significant ($p>0.05$) (24). In a study conducted in Turkey, a positive relationship was found between women's BMI values and emotional eating (r:0.21) and external eating (r:0.06) scores, and a negative relationship was found between their BMI values and averages of restrictive eating subscore (r:-0.24) (25). There are also studies in the literature that show positive relationships between BMI and all three DEBQ eating sub-scores (26,27). In this study, it was determined that as participants' restrictive eating scores increased, BMI, waist circumference, waist-to-hip ratio and waist-to-height ratio decreased ($p<0.05$). Additionally, as participants' emotional eating scores increase, BMI, waist circumference, waist-to-hip ratio and waist-to-height ratio increase ($p<0.05$). The stated situations are seen both in the differences between groups and in the partial correlation analysis. Finally, although there was no difference between the participants' external eating scores and BMI, waist circumference, waist-hip ratio and waist-height ratio groups ($p>0.05$), a weak positive correlation was detected between BMI, waist circumference and waist-height ratio ($p<0.05$).

The detection of positive relationships between emotional and external eating behavior and anthropometric measurements in our study is a common finding in the literature and reveals the importance of psychological infrastructure in the prevention or treatment of obesity. Studies presenting the relationship between anthropometric measurements and restrictive eating behavior are contradictory in the literature. While some studies have shown that restrictive eating behavior contributes to weight loss in the short term, some studies have predicted that it may be a risk factor for weight gain in the future (27-29). In this study, the decrease in anthropometric measurements among women with increasing restrictive eating behavior scores may be due to the fact that the participants did not consist of individuals who had restricted their diet continuously for many years. It can be said that it consists of women who are on a short-term, several-month diet restriction.

Turkey Dietary Guidelines (2022) suggested that the rate of energy taken from food should provide from carbohydrates 45-60%, from protein 10-20% and from fat 20-35% (29). As a result of the research, it was found that 44.8±6.4% of the participants' average daily energy intake came from carbohydrates, 15.3±2.8% from proteins and 39.9±5.5% from fats. While the participants' energy percentage from fat was above the recommended range, it can be said that their protein and carbohydrate intakes were at recommended levels. When the relationship between energy and macronutrients and eating behaviors was analyzed, as participants' restrictive eating scores increased, the amount of energy, carbohydrates, protein, and fat they consumed in their daily diet decreased, while the percentage of energy derived from fat increased. It was found that there is a positive relationship between emotional, external eating behavior scores and the amount of energy, carbohydrate, protein and fat taken by the participants in their daily diet. Additionally, as external eating behavior scores increased, the percentage of daily energy provided by carbohydrates increased, while the percentage provided by protein decreased. Considering that individuals with high emotional and external eating behavior scores prefer foods with high carbohydrate and fat content and high energy density, it was observed that their anthropometric measurements were also higher. Therefore, it can be defended that individuals who exhibit emotional and external eating behaviors are more prone to obesity, as supported by the literature. Furthermore, as the restrictive eating behavior score increased in the study, the energy and macronutrients consumed in the daily diet also decreased, which may have led to a decrease in individuals' anthropometric measurements in the short term.

When the literature is examined, In a study of 303 overweight women aged 18-50 years, total emotional eating score was positively associated with daily energy intake after adjusting for age and BMI (30). A study conducted on French adult women was found a negative relationship between the external eating score and the percentage of energy coming from protein, and between the restrictive eating score and the percentage of energy coming from carbohydrates (31). In another study, participants with high external eating and total DEBQ scores were observed to have higher

daily energy intake, whereas individuals with high restrictive eating scores had lower energy intake. The same study found that individuals with high emotional eating behavior scores consumed more fat in their daily diets, while individuals with high emotional and total DEBQ scores consumed high amounts of fat and protein (32). In a study conducted on 728 adult individuals, it was found that there was a positive relationship between unhealthy food (ready-made foods with high sugar and fat content) consumption status and emotional and external eating scores, and a negative relationship between unhealthy food and restrictive eating scores (33). These data support the study findings and indicate that individuals with restrictive eating behavior tend to consume healthy foods and those with high emotional and external eating scores tend to consume larger amounts of foods containing added sugars and fat. Thus, restrictive eating behavior decreases individuals' daily energy intake, whereas emotional and external eating behavior may increase energy intake.

CONCLUSION

As a result, it is defended that eating behaviors in adult women have a significant relationship with anthropometric measurements and dietary components. In particular, restrictive eating behavior was observed to reduce the energy and carbohydrate amount of the diet, while the opposite occurred in emotional and external eating behavior. Also, it was determined that anthropometric measurement values of individuals showing restrictive eating behavior decrease, while anthropometric measurement values of individuals showing emotional and external eating behavior increase. Considering all these results, it was observed that obesity was associated with eating behaviors. Future studies should examine whether integrating behavioral therapy modules into weight management programs leads to sustained reductions in emotional and external eating behaviors. We believe that behavioral change interference regarding eating behaviors are important in this process. Thus, we can argue that it may be easier to prevent and control obesity, which is the cause of many chronic diseases, morbidity and mortality.

LIMITATIONS

This study has certain limitations, the most significant being that the sample group is restricted to participants from a single center. Secondly, the age range of the participants was wide and the effects of metabolic diseases and biochemical findings were ignored. Finally, it is thought that studies on this subject with longer follow-ups will yield clearer results.

Ethical approval: In this study, we undertake that all the rules required to be followed within the scope of the 'Higher Education Institutions Scientific Research and Publication Ethics Directive' are complied with, and that none of the actions stated under the heading 'Actions Against Scientific Research and Publication Ethics' are not carried out. The ethical approval for this study was granted by the Ethics Committee of Ankara University with decision number 15/201 dated 22.10.2018.
Conflict of interest: The authors declare that they have no conflict of interest.
Author contributions*:* The corresponding author defined the research question, collected data, analyzed data, reported the results and wrote the manuscript. The second author supervised the overall design and conduct the study, supported the interpretation of the findings and supervised the preparation of manuscript. The final version of the study was reviewed and approved by all authors.
Financial support: The authors declare that they received no financial support.
Acknowledgements: This study was produced from master's thesis of corresponding author.

REFERENCES

1. Unlu TN, Deniz D. Obesity policies applied in Turkey; Germany application comparison. Journal of Selcuk Health. 2022;3(1):62-78.
2. Turkey Health Survey Micro Data Set [Internet]. Turkish Statistical Institute; 2022. [Accessed 2025 Nov 21] https://data.tuik.gov.tr/Bulten/Index?p=Turkiye-Saglik-Arastirmasi-2022-49747
3. Dakin C, Finlayson G, Stubbs RJ. Can eating behaviour traits be explained by underlying, latent factors? An exploratory and confirmatory factor analysis. Appetite. 2024;195:107202-107214. doi:10.1016/j.appet.2024.107202
4. Fung XC, Siu AM, Lin CY, Ko PJ, Lin I, Chen JS, et al. Genç yetişkinlerde kilo damgası ve yeme davranışları kilo durumuna göre. Amerikan Sağlık Davranışı Dergisi. 2024;48 (3):56-68. doi:10.5993/AJHB.48.3.6

5. Kabaran S, Mercanligil SM. Which factors affect adolescent food preferences? The Journal of Current Pediatrics. 2013;11(3):121-127. doi:10.4274/Jcp.11.10820
6. Sınar DS, Acar NE, Yıldırım İ. Energy metabolism, obesity and hormones. Turkish Journal of Sports Science. 2020;4(1):30-60. doi:10.32706/tusbid.719671
7. Akten E, Noyan CO. Eating action; a physiological need or a psychological behavior? the relationship between attachment styles and food addictions in university students. Cyprus Turkish Journal of Psychiatry & Psychology. 2019;1(1):30-32. doi:10.35365/ctjpp.19.special1.8
8. Canetti L, Bachar E, Berry EM. Food and emotion. Behavioural Processes. 2002;60(2):157-164. doi:10.1016/s0376-6357(02)00082-7
9. Wu S, Cai T, Luo X. Validation of the dutch eating behavior questionnaire (DEBQ) in a sample of Chinese adolescents. Psychology, Health & Medicine. 2017;22(3):282-288. doi:10.1080/13548506.2016.1173712
10. Sevincer GM, Konuk N. Emotional eating. Journal of Mood Disorders. 2013;3(4):171-178. doi:10.5455/jmood.20130926052526
11. Manzoni GM, Rossi A, Pietrabissa G, Varallo G, Molinari E, Poggiogalle E, et al. Validation of the Italian Yale Food Addiction Scale in postgraduate university students. Eating and weight disorders: EWD. 2018;23(2):167–176. doi:10.1007/s40519-018-0495-0
12. Baudinet J, Simic M, Griffiths H, Donnely C, Stewart C, Goddard E. Targeting maladaptive overcontrol with radically open dialectical behaviour therapy in a day programme for adolescents with restrictive eating disorders: an uncontrolled case series. Journal of Eating Disorders. 2020;8(1):68-80. doi:10.1186/s40337-020-00338-9
13. Singh, A., Bains, K., & Kaur, H. Relationship of Eating Behaviors with Age, Anthropometric Measurements, and Body Composition Parameters among Professional Indian Women. Ecology of food and nutrition. 2017;56(5):411–423. doi:10.1080/03670244.2017.1366317
14. Bozan N. To Determine of The DEBQ's Reliability and Validity on Turkish University Students [Master Thesis]. Ankara: Baskent University; 2009.
15. BEBIS Nutrition Data Base Software Data Base, 2004. The German Food Code and Nutrient Data Base (BLSII.3, 1999) with additions from USDA-sr and other sources, Istanbul, Turkey.
16. Childhood Obesity Surveillance Initiative (COSI): data collection procedures: 2017. World Health Organization; 2016 October [Accessed Apr 11].
17. Tasli H, Sağır S. Comparison of the methods of body mass index, waist circumference, waist-hip ratio used in the determination of obesity. Ahi Evran University Institute of Social Sciences Journal. 2021;7(1):138-150.
18. World Health Organization. Waist circumference and waist-hip ratio: Report of a WHO expert concultation. WHO Technical Report Series; 2008 December [Accessed 2024 May 15].
19. Bener A, Yousafzai MT, Darwish S, Al-Hamaq AOAA, Nasralla EA, Abdul-Ghani M. Obesity index that better predict metabolic syndrome: body mass index, waist circumference, waist hip ratio, or waist height ratio. Journal of Obesity. 2013;269038. doi:10.1155/2013/269038
20. Song YM, Lee K, Sung J, Yang Y. Changes in eating behaviors and body weight in Koreans: The healthy twin study. Nutrition. 2013;29(1):66-70. doi:10.1016/j.nut.2012.03.014
21. Kiro LS, Zak MY, Chernyshov OV, Nikolenko AE, Iakovenko NO. Eating behaviour and obesity: gender-age features. Wiadomosci Lekarskie. 2021;74(5):1114-1119.
22. Roy SK, Jahan K, Alam N, Rois R, Ferdaus A, Israt S, et al. Perceived stress, eating behavior, and overweight and obesity among urban adolescents. Journal of Health, Population and Nutrition. 2021;40(1):54-66. doi:10.1186/s41043-021-00279-2
23. Borisenkov M, Tserne T, Bakutova L, Smirnov V, Popov S. The association between sleep timing, eating behavior, and obesity in young adults. Chronobiology International. 2025;42(10):1417-1426. doi:10.1080/07420528.2025.2551025
24. Benbaibeche H, Saidi H, Bounihi A, Koceir EA. Emotional and external eating styles associated with obesity. Journal of eating disorders. 2023;11(1):67-73. doi:10.1186/s40337-023-00797-w
25. Guzey M. Assessment of the Effect of Weight Management over Eating Behavior in Women [Master's thesis]. Ankara: Baskent University; 2014.
26. Benbaibeche H, Saidi H, Bounihi A, Koceir EA. Emotional and external eating styles associated with obesity. Journal of Eating Disorders. 2023;11(1):67-73. doi:10.1186/s40337-023-00797-w
27. Dutton E, Dovey TM. Validation of the Dutch eating behaviour questionnaire (DEBQ) among Maltese women. Appetite. 2016;107:9-14. doi:10.1016/j.appet.2016.07.017
28. Lowe MR, Doshi SD, Katterman SN, Feig EH. Dieting and restrained eating as prospective predictors of weight gain. Frontiers in Psychology. 2013;2(4):577. doi:10.3389/fpsyg.2013.00577
29. Turkey Dietary Guidelines [Internet]. TUBER; 2022 [Accessed 2024 June 5]. https://hsgm.saglik.gov.tr/Turkiye_Beslenme_Rehber_TUBER_2022_min.pdf
30. Zare H, Rahimi H, Omidi A, Nematolahi F, Sharifi N. Relationship between emotional eating and nutritional intake in adult women with overweight and obesity: a cross-sectional study. Nutr J. 2024;23(1):129-137. doi:10.1186/s12937-024-01030-3
31. Lluch A, Herbeth B, Mejean L, Siest G. Dietary intakes, eating style and overweight in the Stanislas Family Study. International Journal of Obesity. 2000;24(11):1493-1499. doi:10.1038/sj.ijo.0801425
32. Ryu GB, Heo YR. Exploring Emotional, Restrained, and External Eating Behaviors: Impacts on Energy and Nutrient Intakes Among Korean Adults. Nutrients. 2025;17(3):473-484. doi:10.3390/nu17030473

33. Caso D, Guidetti M, Capasso M, Cavazza N. Finally, the chance to eat healthily: Longitudinal study about food consumption during and after the first COVID-19 lockdown in Italy. Food Quality and Preference. 2022;95:104275. doi:10.1016/j.foodqual.2021.104275