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RESEARCH ▪ ARAŞTIRMA

Revealing the Nourishing Nexus: Exploring How Eating Behaviors Impact Quality of Life Among Turkish Women

Besleyici Bağın Ortaya Çıkarılması: Türk Kadınları Arasında Yeme Davranışlarının Yaşam Kalitesini Nasıl Etkilediğinin Araştırılması

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ABSTRACT

Aim: The aim of this study was to examine the effects of the rapidly spreading worldwide obesity epidemic on eating behaviors and quality of life in the adult female population in Türkiye.

Methods: In this cross-sectional study, data were collected by face-to-face survey technique. The data collection form included demographic questions, the Three-Factor Eating Questionnaire-Short Form (TFEQ), SF-12 Health Survey, International Physical Activity Questionnaire-Short Form (IPAQ), 24-hour dietary recall, and anthropometric measurements (body weight and height).

Results: A total of 1466 women participated in the study and their mean age was 37.69±11.50 years. According to the SF-12 Health Survey, the mean physical component summary score (PCS-12) of the participants was 38.93±10.90 and the mean mental component summary score was (MCS-12) 37.52±11.83. The results of the Three-Factor Eating Questionnaire (TFEQ), the mean cognitive restriction score of the participants was 45.44±32.84, the mean emotional eating score was 33.62±38.36, the mean uncontrolled eating score was 34.88±24.12 and the mean IPAQ-SF MET score was 1797.6±2574.11. In addition, the PCS-12 score of individuals with BMI of >30 kg/m2 was 35.20±11.18, which was significantly lower compared to other groups ($p<0.001$). The MCS-12 score of individuals with BMI of <18.5 kg/m2 was 34.95±11.07, and this was lower compared to other groups ($p<0.001$). According to the TFEQ, there was a positive relationship between both the women's cognitive restriction scores ($r=0.250$, $p<0.001$) and emotional eating scores ($r=0.270$, $p<0.001$) and their BMI values. Based on the regression results, both the physical and mental component summary scores had a significant impact on uncontrolled eating. Moreover, the mental component summary score significantly affected emotional eating ($p=0.027$), while the physical component summary score had a significant effect on cognitive restraint ($p=0.013$).

Conclusions: In this study, which thoroughly examined eating behaviors in a country where over 50% of the adult female population is overweight or obese, a strong relationship between obesity, eating behaviors, and quality of life was observed.

Keywords: Eating behaviors, obesity, physical activity, quality of life

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ÖZET

Amaç: Bu çalışmanın amacı, dünya çapında hızla yayılan obezite epidemisinin Türkiye'deki yetişkin kadın popülasyonunda yeme davranışları ve yaşam kalitesi üzerindeki etkilerini incelemektir.

Yöntem: Bu kesitsel çalışmada veriler yüz yüze anket tekniği ile toplanmıştır. Veri toplama formunda demografik sorular, Üç Faktörlü Yeme Anketi-Kısa Formu (TFEQ), SF-12 Sağlık Anketi, Uluslararası Fiziksel Aktivite Anketi-Kısa Formu (IPAQ), 24 saatlik diyet hatırlama ve antropometrik ölçümler (vücut ağırlığı ve boy uzunluğu) yer almıştır.

Bulgular: Çalışmaya toplam 1466 kadın katılmıştır ve yaş ortalamaları 37.69±11.50'dir. SF-12 Sağlık Anketine göre, katılımcıların ortalama fiziksel bileşen özet puanı (PCS-12) 38.93±10.90 ve ortalama zihinsel bileşen özet puanı (MCS-12) 37.52±11.83'tür. Üç Faktörlü Yeme Anketi (TFEQ) sonuçlarına göre, katılımcıların ortalama bilişsel kısıtlama puanı 45.44±32.84, ortalama duygusal yeme puanı 33.62±38.36, ortalama kontrolsüz yeme puanı 34.88±24.12 ve IPAQ-SF MET skoru 1797.6±2574'tür. Ayrıca, BKİ >30 kg/m2 olan bireylerin PCS-12 puanı 35.20±11.18 olup diğer gruplara kıyasla anlamlı derecede düşüktür ($p<0.001$). BKİ <18.5 kg/m2 olan bireylerin MCS-12 puanı 34.95±11.07'dir ve diğer gruplara kıyasla daha düşüktür ($p<0.001$). TFEQ'ya göre, kadınların hem bilişsel kısıtlama puanları ($r=0.250$, $p<0.001$) hem de duygusal yeme puanları ($r=0.270$, $p<0.001$) ile BKİ değerleri arasında pozitif bir ilişki vardır. Regresyon sonuçlarına göre hem fiziksel hem de zihinsel bileşen özet puanları kontrolsüz yeme üzerinde anlamlı bir etkiye sahiptir. Ayrıca, zihinsel bileşen özet puanı duygusal yemeyi anlamlı şekilde etkilerken ($p=0.027$), fiziksel bileşen özet puanı bilişsel kısıtlama üzerinde anlamlı bir etkiye sahiptir ($p=0.013$).

Sonuç: Yetişkin kadın nüfusunun %50'sinden fazlasının pre-obez veya obez olduğu bir ülkede yeme davranışlarını kapsamlı bir şekilde inceleyen bu çalışmada, obezite, yeme davranışları ve yaşam kalitesi arasında güçlü bir ilişki olduğu görülmüştür.

Anahtar kelimeler: Yeme davranışları, obezite, fiziksel aktivite, yaşam kalitesi

INTRODUCTION

Obesity, which is often referred to as the pandemic of the current century, leads to the development of various complications including diabetes mellitus, cardiovascular diseases, and cancer (1). The World Health Organization (WHO) defines obesity as an excessive accumulation of fat that can have adverse effects on health based on the diagnostic criterion of a body mass index (BMI) value of ≥30 kg/m^2 (2,3). According to WHO data from 2022, Türkiye ranks first in obesity prevalence in Europe (4). The data from the Turkish Statistical Institute highlights significant concerns regarding obesity and pre-obesity among adults (≥15 years) in Türkiye. The body weight and height measurements were not measured but self-reported. In 2022, 23.6% of adult women were classified as obese, while 30.9% were overweight. For men, the figures were 16.8% for obesity and 40.4% for pre-obesity. This indicates a higher prevalence of pre-obesity among men compared to women, while women have a higher rate of obesity. These statistics underscore the need for public health initiatives aimed at addressing these issues (5). The WHO predicted that by 2035, 55.0% of adults in Türkiye will be obese, and approximately 1 in 4 people on a global level, or about 2 billion individuals, will face the issue of obesity (6).

One important factor contributing to the development of obesity is the presence of an obesogenic environment, which increases individuals' susceptibility to weight gain and unhealthy eating behaviors. Obesogenic environments trigger this susceptibility in individuals by impacting behaviors such as uncontrolled eating, emotional eating, and cognitive restraint. These situations may create a positive energy balance or may lead affected individuals to exhibit behavioral tendencies aimed at controlling their energy balance. These tendencies

can be psychometrically measured (7). One clinically validated psychometric scale that measures specific dimensions of eating behavior is the Three-Factor Eating Questionnaire (TFEQ) (8,9). There are other scales available for measuring eating behavior traits, but the TFEQ is particularly popular due to its ability to examine both eating behaviors and behaviors related to personality traits, directly measuring factors that have clinical significance (8,10). In a study conducted in Brazil that evaluated 59 women between the ages of 18 and 59 using the TFEQ-21, it was found that emotional eating was the most commonly observed eating behavior disorder (11). In another study that included 169 women between the ages of 20 and 39 years and used the TFEQ-21 to examine eating behaviors, it was shown that as BMI increased, emotional eating and uncontrolled eating behaviors also increased (12).

Another parameter significantly affected by the clinical condition of obesity and its complications is quality of life (1). A better quality of life has been associated with better physical condition, nutritional status, and self-perceived general health (13). According to the results of a study that used the Short Form Health Survey-12 (SF-12) to examine quality of life among Dutch individuals aged 50 and older, it was found that women had lower quality of life compared to men, and findings from the Study on Global Ageing and Adult Health (SAGE) surveys conducted among Chinese individuals also support this conclusion (14,15). In a study comparing Turkish women to European women based on conclusions drawn from the European Action on Secondary and Primary Prevention by Intervention to Reduce Events III (EUROASPIRE III), it was shown that the Turkish women had lower quality of life and, according to IPAQ-SF MET results, engaged in lower levels of physical activity compared to European women (16). Considering all this information, the aim of the present study was to examine the effects of the rapidly spreading global obesity epidemic on eating behaviors and quality of life.

SUBJECTS AND METHOD

Study Setting and Population

This study was conducted by reaching individuals who came to nine Family Centers in Mamak district of Ankara province. The study population comprised 1466 women aged between 18 and 65 years. Data were collected via the face-to-face survey technique using a data collection form. The data collection form included demographic questions, the Three-Factor Eating Questionnaire, the SF-12 Health Survey, the International Physical Activity Questionnaire-Short Form, 24-hour dietary recall, and anthropometric measurements.

Post hoc G*Power analyses were carried out to confirm that the study had adequate power. According to regression analyses for Model 1 for uncontrolled eating, the effect size was calculated as 0.0922993 (α=0.05). The power of the study was 0.99.

Anthropometric Measurements

Anthropometric variables including height and body weight were measured by an expert dietitian/nutritionist. Height was measured with a tape measure. Body weight was measured using a digital scale while participants were minimally clothed without shoes. BMI was calculated as body weight (kg) divided by the square of height (m^2) (17). Obesity classification was defined such as <18.5 kg/m^2 underweight, 18.5-24.9 kg/m^2 normal range, ≥25 kg/m^2 overweight, ≥30 kg/m^2 obese (3).

Instruments

Three-Factor Eating Questionnaire (TFEQ-21): The TFEQ is among the most extensively utilized instruments for studying eating behaviors. Initially comprising 51 items, it was formulated to evaluate three distinct eating behaviors (cognitive restraint, disinhibition, and hunger) among obese individuals (9). Updated versions of the TFEQ measure three aspects: cognitive restraint (CR), similarly to the

original TFEQ; uncontrolled eating (UE), which combines the factors of disinhibition and hunger from the original TFEQ and is related to how people react to food taste, social influences, and hunger, leading to episodes of uncontrolled eating; and emotional eating (EE), which pertains to instances of eating triggered by negative emotions (7). Karakus et al. (18) conducted a study of the reliability and validity of the Turkish version of the TFEQ-21, which was confirmed to have a three-factor structure. The emotional eating (EE) factor examines eating behaviors that arise from positive or negative emotional states; uncontrolled eating (UE) refers to losing control and overeating, typically in response to hunger or external stimuli; and cognitive restraint (CR) describes the conscious restriction of food intake to manage body shape and weight. The minimum possible score from the UE subscale is 9, with a maximum of 36. For the CR and EE subscales, the minimum score is 6 and the maximum is 24. The Cronbach alpha coefficients were found to be 0.801 for CR, 0.870 for EE, and 0.787 for UE.

SF-12 Health Survey: The SF-12 Health Survey is the practical abridged version of the 36-item Short-Form Health Survey (SF-36) developed as an applicable instrument for measuring health-related quality of life (19–21). Soylu and Kutuk (22) conducted a study of the reliability and validity of the Turkish version of the SF-12 Health Survey.

The SF-12 is a health-related quality-of-life questionnaire consisting of 12 questions that measure 8 health domains to assess physical and mental health. The physical health-related domains include general health perceptions (1 item), physical functioning (2 items), usual role limitations due to physical health problems (2 items), and bodily pain (1 item). The mental health-related domains include vitality (1 item), social functioning (1 item), role limitations due to emotional problems (2 items), and mental health (2 items) (23,24). The SF-12 measures physical and mental health by means of two summary scores including a physical component summary (PCS-12) and a mental component summary (MCS-12) (25).

Scores range from 0 to 100, with higher scores indicating better physical and mental health functioning (25,26).

International Physical Activity Questionnaire Short Form (IPAQ-SF MET): The International Physical Activity Questionnaire (IPAQ) was developed by a group of experts in 1998 to facilitate surveillance of physical activity based on a global standard (27). The IPAQ has since become the most widely used physical activity questionnaire, with two versions available: the 31-item long form (IPAQ-LF) and the 9-item short form (IPAQ-SF). The short form records activities at four intensity levels: 1) vigorous-intensity activities such as aerobics, 2) moderate-intensity activities such as leisure cycling, 3) walking, and 4) sitting. Craig et al. (28) recommended the “last 7-day recall” version of the IPAQ-SF MET for physical activity surveillance studies, in part because the burden on participants to report their activity is small. Saglam et al. (28) conducted a study on the reliability and validity of the Turkish version of the IPAQ. The International Physical Activity Questionnaire Short Form (IPAQ-SF MET) was used to assess participants’ physical activity levels, and the results were calculated as total MET scores by multiplying the metabolic equivalent (MET) value of each physical activity category (walking, moderate, vigorous activity) by the duration (minutes) and frequency (days) (28).

24-Hour Dietary Recall (24HR)

The 24-hour recall method as originally attributed to Wiehl (1942) entails interviewing. A 24-hour dietary recall (24HR) is a structured interview intended to capture detailed information about all foods and

beverages consumed by the respondent in the past 24 hours, most commonly the recalled day is defined as from when the respondent gets up one day until the respondent gets up the next day (29). A key feature of the 24HR is that, when appropriate, the respondent is asked for more detailed information than first reported. For example, a respondent reporting chicken for dinner or a sandwich for lunch would be asked about the preparation method or type of bread. This open-ended response structure is designed to prompt respondents to provide a comprehensive and detailed report of all foods and beverages consumed. In addition to other detailed descriptors, such as time of day and source of food, the portion size of each food and beverage is captured. The determination of food quantity can be achieved using household measures, weights, volumes, food photographs from the Food Photo Catalog Book, standard units, and standardized portions (30). The dietitians entered dietary data directly into Nutrition Information System (BeBiS) software, an interactive nutrition analysis software program (31,32).

Statistical Evaluation of Data

The obtained data were analyzed descriptively using numbers (n), percentages (%), means ($\bar{x}$), and standard deviations (SD). The normality of data distribution was assessed using Kolmogorov-Smirnov and Shapiro-Wilk tests. For groups showing normal distribution, one-way ANOVA tests were used to evaluate the means and Tukey post hoc tests were used to determine the groups that differed significantly. Pearson correlation tests were employed to determine the direction and strength of the relationships between two numerical variables. Multiple linear regression analysis was also performed for the IPAQ-SF MET, BMI, SF-12 scores, some demographic variables (independent variable), and TFEQ-21 scores. IBM SPSS Statistics 20 (IBM Corp.) was used for statistical analysis with significance accepted at $p<0.05$. The dietitians entered the dietary data directly into Nutrition Information System (BeBiS) software, an interactive nutrition analysis software program (31,32).

Ethical Statement

Participation in the study was voluntary, and individuals who approved of the Informed Consent Form were able to continue the study. In order to conduct the study, an application was made to the Lokman Hekim University Non-Interventional Clinical Research Ethics Committee, and approval was received with the decision numbered 2022/10-1 dated 07.07.2022.

RESULTS

Table 1 shows the characteristics of the study population. In this study, 1466 female participants completed the questionnaire. The mean age of the participants was 37.69±11.50 years and 1124 (76.7%) of them were married. The majority of participants (36.2%) had a high school education and 63.9% were housewives. The mean (±SD) IPAQ-SF MET scores of the women in the study were 1797.6±2574.11. According to the SF-12 Health Survey, the participants had a mean PCS-12 score of 38.93±10.90 and a mean MCS-12 of 37.52±11.83. Based on the results of the TFEQ, the participants had a mean score of 45.44±32.84 for cognitive restraint, 33.62±38.36 for emotional eating, and 34.88±24.12 for uncontrolled eating.

The nutritional characteristics of the female participants of this study based on their BMI values are presented in Table 2. It was determined that the frequency of fast-food consumption was higher among participants with lower BMI values ($p<0.001$). Individuals with BMI of >30 kg/m^2 were found to skip lunch most frequently ($p<0.001$). Regarding participants' dietary intake, it was determined that the individuals with the highest BMI values had the lowest energy intake ($p=0.015$) and the highest protein intake ($p=0.007$).

Table 1. Characteristics of the population

	Female (n=1466)
Age (years) ($\bar{x}$±SD)	37.69±11.50
Marital status	
Married	1124 (76.7%)
Single	342 (23.3%)
Children	
Yes	1128 (76.9%)
No	338 (23.1%)
Number of children	
No children	338 (23.1%)
1-3 children	1073 (73.2%)
≥4 children	58 (4.0%)
Education level	
No formal education	28 (1.9%)
Literate	19 (1.3%)
Primary/middle school	480 (32.7%)
High school	530 (36.2%)
University	409 (27.9%)
Occupation	
Student	162 (11.1%)
Government employee	131 (8.9%)
Retiree	23 (1.6%)
Self-employed	69 (4.7%)
Private sector	113 (7.7%)
Housewife	937 (63.9%)
Unemployed	31 (2.1%)
Income status	
Income is lower than expenses	570 (38.9%)
Income equals expenses	798 (54.4%)
Income exceeds expenses	98 (6.7%)
	$\bar{x}$±SD
IPAQ-SF score (MET/min/week)	1797.6±2574.11
SF-12 Health Survey scores	
PCS-12 score	38.93±10.90
MSC-12 score	37.52±11.83
Three-Factor Eating Questionnaire scores	
Cognitive restraint	45.44±32.84
Emotional eating	33.62±38.36
Uncontrolled eating	34.88±24.12

IPAC SF:International Physical Activity Questionnaire Short Form, SF-12: Short Form-12, PCS-12:physical component summary score, MSC-12:mental component summary score.

Individuals with BMI values above 30 kg/m^2 were found to have significantly higher scores for both cognitive restraint and emotional eating compared to other groups (p<0.001).

For individuals with BMI of >30 kg/m^2, the mean PCS-12 score was 35.20±11.18, which was significantly lower compared to other groups (p<0.001). Individuals with BMI values below 18.5 kg/m^2 had the lowest mean MSC-12 score of 34.95±11.07 (p<0.001). Details of the scores obtained from the scales based on participants' nutritional statuses are presented in Table 3.

There were low positive correlations between cognitive restraint scores (r=0.250, p<0.001) and emotional eating scores (r=0.270, p<0.001) according to the TFEQ and BMI values, which were statistically significant. The relationship between the women's uncontrolled eating scores (r=0.070, p=0.007) according to the TFEQ and BMI was found to be statistically significant. The relationship between the women's PCS-12 scores according to the SF-12 Health Survey and BMI (r=-0.267, p<0.001) was found to be low, negative, and statistically significant. The relationships between the women's MCS-12 scores and emotional eating scores (r=-0.086, p<0.001) and their uncontrolled eating scores (r=-0.132, p<0.001) according to the SF-12 Health Survey were very low, negative, and statistically significant. The relationships between PCS-12 scores and emotional eating scores (r=-0.081, p=0.002) and uncontrolled eating scores (r=-0.144, p<0.001) according to the SF-12 Health Survey were very low, negative, and statistically significant (Figure 1).

Table 4 shows the relationship between the SF-12 Health Survey and eating behaviors according to linear regression analysis. In Model 1, the effects of the PCS-12 scores (p=0.003) and MSC-12 scores (p<0.001) on uncontrolled eating scores were statistically significant. A one-unit increase in the PCS-12 scores of the participating women caused a decrease of 0.086 in their uncontrolled eating scores while a one-unit increase in MCS-12 scores caused

Table 2. Nutritional characteristics of the females

	Body mass index (kg/m²)				
	<18.5	**18.5-24.9**	**25-29.9**	**≥30**	**χ^2 p**
Nutritional habits					
Regular consumption of main meals					
Yes	32 (50.8%)	217 (44.4%)	220 (44.4%)	139 (33.2%)	**17.642**
No	31 (49.2%)	272 (55.6%)	276 (5.6%)	285 (68.1%)	**<0.001a**
Most skipped main meal					
Breakfast	14 (22.2%)	53 (10.8%)	53 (10.7 %)	42 (10.0%)	**41.175**
Lunch	18 (28.6%)	204 (41.7%)	206 (41.6%)	235 (56.1%)	**<0.001a**
Dinner	-	17 (3.5%)	17 (3.4%)	8 (1.9%)	
Fast food consumption					
Every day	11 (17.5%)	40 (8.2%)	21 (4.2%)	8 (1.9%)	**76.877**
1-3 times a week	26 (41.3%)	244 (49.9%)	248 (50.1%)	194 (46.3%)	**<0.001a**
4-6 times a week	7 (11.1%)	16 (3.3%)	13 (2.6%)	13 (3.1%)	
1-3 times a month	11 (17.5%)	109 (22.3%)	110 (22.2%)	74 (17.7%)	
Never	8 (12.7%)	80 (16.4%)	103 (20.8%)	130 (31.0%)	
Frequency of sugary product consumption					
Every day	34 (54.0%)	244 (49.9%)	226 (45.7%)	175 (41.8%)	15.874
1-3 times a week	17 (27.0%)	136 (27.8%)	134 (27.1%)	145 (34.6%)	0.197
4-6 times a week	3 (4.8%)	22 (4.5%)	29 (5.9%)	18 (4.3%)	
1-3 times a month	3 (4.8%)	43 (8.8%)	47 (9.5%)	44 (10.5%)	
Never	6 (9.5%)	44 (9.0%)	59 (11.9%)	37 (8.8%)	
					One-way anova
Nutrient intake ($\bar{x}$±SD)					**p**
Energy (kcal)	1502.82±715.34[c]	1305.27±554.44[d]	1268.10±556.59[d]	1280.06±529.17[d]	**0.015**
Carbohydrates (%)	47.77±11.34	46.35±12.01	45.63±12.05	45.65±12.03	0.459
Fat (%)	37.71±10.34	37.90±11.31	37.98±10.98	37.92±11.07	0.998
Protein (%)	14.50±3.58[c]	15.79±4.49	16.41±4.95[d]	16.17±4.29[d]	**0.007**
Dietary fiber (g)	14.91±8.42	15.35±12.64	14.64±8.83	15.90±9.87	0.336
Saturated fatty acids (g)	25.40±13.64	22.11±32.74	20.85±12.16	20.46±11.03	0.268
Monounsaturated fatty acids (g)	20.86±10.87	21.42±32.08	19.05±10.55	19.77±12.04	0.324
Polyunsaturated fatty acids (g)	10.66±7.09	9.86±7.78	10.20±21.10	9.53±7.27	0.866
Omega-3 fatty acids (g)	1.44±1.93	1.39±2.30	1.41±2.73	1.50±3.02	0.932
Omega-6 fatty acids (g)	8.93±6.57	8.06±6.98	7.73±6.66	7.86±6.74	0.571
Cholesterol (mg)	247.96±202.39	258.79±251.78	256.27±207.35	254.11±170.96	0.977
Magnesium (mg)	202.56±103.29	211.07±122.56	209.44±210.30	218.53±137.95	0.790
Phosphorus (mg)	822.35±380.09	793.30±368.95	771.57±345.19	817.95±516.48	0.360
Iron (mg)	7.88±4.17	7.99±3.99	8.01±4.54	8.28±4.50	0.715
Zinc (mg)	8.66±4.71	7.92±6.44	7.98±3.69	8.07±3.68	0.698
Niacin (mg)	10.81±8.75	10.81±9.27	11.13±8.53	11.16±8.83	0.925
Vitamin B6 (mg)	0.92±0.46	0.93±0.59	0.94±0.61	1.61±13.61	0.457
Folate (µg)	203.78±115.74	234.80±261.09	222.11±117.88	238.74±124.97	0.307
Vitamin B_{12} (µg)	3.45±2.70	3.58±6.48	4.41±16.01	3.61±5.37	0.562
Vitamin C (mg)	70.29±46.31	78.71±60.39	81.62±63.77	89.01±88.31	0.072

Chi-square test, bold font indicates significance; One-way ANOVA test (post hoc Tukey test); differing letters (c, d) represent statistical significance in same lines.

Table 3. Scale scores according to BMI groups in females

	Body mass index (kg/m²)				
	<18.5	**18.5-24.9**	**25-29.9**	**≥30**	**p**
TFEQ - Cognitive Restraint score	10.58±20.04[b]	37.17±31.98[c]	51.64±32.86[c]	53.02±29.71[c]	**<0.001**
TFEQ - Emotional Eating score	19.57±28.13[b]	26.68±35.89[c]	33.78±38.64[c]	43.64±39.81[c]	**<0.001**
TFEQ - Uncontrolled Eating score	39.50±25.17[c]	32.47±23.20[b]	33.53±24.31[c]	38.61±24.32[c]	**<0.001**
IPAQ-SF score (MET/min/week)	2352.46±4204.89	1712.18±2110.95	1895.36±2754.54	1698.39±2520.87	**0.187**
PCS-12 score	41.55±10[c]	42.49±9.86[c]	38.24±10.59[c]	35.20±11.18[b]	**<0.001**
MCS-12 score	34.95±11.07[b]	39.08±12.07[c]	37.55±11.97[c]	36.06±11.26[c]	**<0.001**

One-way ANOVA test (post hoc Tukey test); differing letters ([b, c]) represent statistical significance; bold font indicates significance
IPAC SF (MET/min/week): International Physical Activity Questionnaire Short Form, SF-12: Short Form-12, MSC-12:mental component summary score , PCS-12:physical component summary score, TFEQ: Three-Factor Eating Questionnaire.

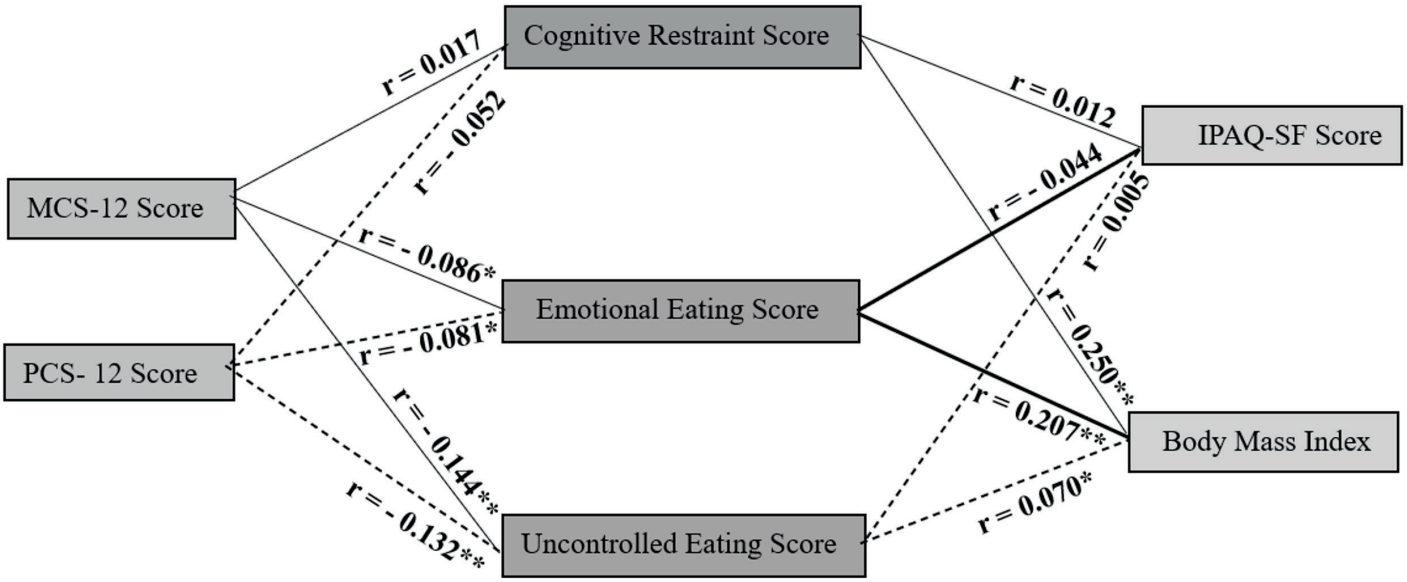

Figure 1. Correlations Between TFEQ-21 Eating Behavior Questionnaire Components and SF-12 Health Survey Components, Body Mass Index, and IPAQ-SF Score.
**: p<0.05, **: p< 0.001. IPAQ-SF (MET/min/week): International Physical Activity Questionnaire-Short Form*

a decrease of 0.108. In Model 2, the effect of BMI on uncontrolled eating behavior was statistically significant (p<0.001, R^2=0.064). A one-unit increase in the BMI values of the women caused an increase of 0.128 in their uncontrolled eating scores. The effect of BMI on emotional eating was also statistically significant (p<0.001). Regression analyses in which some demographic characteristics, IPAQ-SF MET scores, and BMI were considered as independent variables are presented in Table 4.

Table 4. Relationship between SF-12 health survey and eating behaviors according to linear regression analysis

	TFEQ-21 Eating Behavior Questionnaire											
Independent variables	**Uncontrolled Eating**				**Emotional Eating**				**Cognitive Restraint**			
	B	**SE**	**β**	**p**	**B**	**SE**	**β**	**p**	**B**	**SE**	**β**	**p**
Model 1												
PCS-12 score	-0.190	0.063	-0.086	**0.003**	-0.190	0.101	-0.054	0.060	-0.217	0.087	-0.072	**0.013**
MCS-12 score	-0.220	0.058	-0.108	**<0.001**	-0.206	0.093	-0.063	**0.027**	0.132	0.080	0.048	0.097
	(R^2=0.026, F=23.812, **p<0.001**)				(R^2=0.008, F=38.202, **p<0.001**)				(R^2=0.003, F=32.789, **p=0.036**)			
Model 2												
IPAQ-SF score (MET/min/week)	4.244	0.000	0.005	0.858	-0.001	0.000	-0.038	0.135	0.000	0.000	0.025	0.321
BMI	0.535	0.121	0.128	**<0.001**	1.855	0.191	0.279	**<0.001**	1.380	0.165	0.243	**<0.001**
Age	-0.445	0.071	-0.212	**<0.001**	-0.297	0.112	-0.089	**0.008**	0.050	0.097	0.017	0.607
Marital status	-1.291	2.289	-0.023	0.573	-5.382	3.618	-0.059	0.137	-3.787	3.121	-0.049	0.225
Having children	3.140	2.479	0.055	0.206	10.280	3.918	0.113	**0.009**	0.227	3.380	0.003	0.946
Education level	-0.147	0.750	-0.006	0.845	4.011	1.186	0.098	**0.001**	0.830	1.023	0.024	0.417
MCS-12 score	-0.167	0.057	-0.082	**0.004**	-0.183	0.091	-0.056	**0.044**	0.091	0.078	0.033	0.247
PCS-12 score	-0.299	0.066	-0.135	**<0.001**	-0.151	0.104	-0.043	0.149	0.010	0.090	0.003	0.912
	(R^2=0.064, F=23.332, **p<0.001**)				(R^2=0.081, F=16.143, **p<0.001**)				(R^2=0.062, F=31.808, **p<0.001**)			

Variables included in Model 2: IPAQ-SF score (continuous), BMI (continuous), age (continuous), marital status (married: 1, single: 2), having children (yes: 1, no: 2), education level (no formal education: 1, literate: 2, primary/middle school: 3, high school: 4, university: 5), MCS-12 score (continuous), PCS-12 score (continuous)

Bold font indicates significance.

IPAC SF (MET/min/week): International Physical Activity Questionnaire Short Form, SF-12: Short Form-12, MSC-12:mental component summary score, PCS-12: physical component summary score.

DISCUSSION

In this study completed with the participation of 1466 adult women, in which eating behaviors were evaluated with the TFEQ-21 and participants' food intake and nutritional status were assessed, it was found that both physical and mental summary scores and cognitive restraint, emotional eating, and uncontrolled eating scores had significant relationships. All TFEQ-21 sub-scores (cognitive restraint, emotional eating, and uncontrolled eating) were higher among obese and overweight women. In regression analyses, significant effects were observed for both physical and mental quality-of-life summary scores on uncontrolled eating, for the mental summary score on emotional eating, and for the physical summary score on cognitive restriction. To the best of our knowledge, this is the first study conducted in Türkiye that examines the quality of life and eating behaviors of the adult female population.

A two-way relationship between emotional eating and quality of life was identified in this study. Emotional eating behaviors increase both when the quality of life decreases and when levels of stress or other negative emotions increase. Moreover, with increases in emotional eating behaviors, increases in BMI and gastrointestinal diseases negatively affect individuals' quality of life (33,34). In this study, it was found that emotional eating scores increased with increasing BMI and that emotional eating scores were negatively correlated with quality-of-life scores. Other studies in the literature conducted in different adult populations support these findings (11,35).

Uncontrolled eating entails the loss of control while consuming foods with a subjective feeling of hunger (36). In a study involving 190 adults in Algeria, it was reported that the uncontrolled eating scores of participants in the obese and overweight groups were significantly higher than those of individuals of healthy weight (37). In this study, it was found that as BMI values increased, uncontrolled eating scores increased ($p<0.001$), and obese individuals had significantly higher uncontrolled eating scores.

Cognitive restraint describes an individual's cognitive restriction of food intake, ignoring physical determinants such as hunger and satiety (38). In this study, it was found that increases in BMI and decreases in the physical quality-of-life summary score increased the cognitive restraint scores. A study conducted in Spain with 925 young adult participants, 77.8% of whom were women, showed a positive relationship between cognitive restraint and BMI (34). Similar findings were reported in a study of the relationship between quality of life and cognitive restraint among patients with type 2 diabetes and individuals after bariatric surgery (39).

According to the regression analysis results, statistically significant relationships existed between both emotional eating and uncontrolled eating scores and age. As age increased, both the emotional eating scores and the uncontrolled eating scores decreased. Abdella et al. (40) showed a similar relationship between age and both emotional eating and uncontrolled eating scores in a study involving a younger population conducted with 475 participants.

CONCLUSION

Today, to prevent the increase of obesity, it is of great importance to understand the causes of obesity and take steps to prevent it, in addition to treating it.

STRENGTHS AND LIMITATIONS

In this study, which examined eating behaviors comprehensively in a country where over 50% of the adult female population is overweight or obese, the strength of the relationship between obesity-related eating behaviors and quality of life was demonstrated. The 24-HR technique was used in this study to evaluate nutritional intake. This method has the inherent disadvantage of relying on participants' memories. Instead, it may be recommended to examine food intake through daily recordings in future studies. It should also be noted that this was a cross-sectional study and the results are therefore not generalizable.

Author contributions ▪ Yazarlık katkısı: *Çalışmanın tasarımı: AD, ÖB, NNS, AC; Çalışma verilerinin elde edilmesi: NNS, AC, MEK, CS; Verilerin analiz edilmesi: GD, NNS, AC, MEK, CS; Makale taslağının oluşturulması: GD, NNS, AC; İçerik için eleştirel gözden geçirme: AD, SY, ÖB, GD, BD, CS, NNS, MEK, AC; Yayınlanacak versiyonun son onayı: AD, SY, ÖB, GD, BD, CS, NNS, MEK, AC. ▪ Study design: AD, ÖB, NNS, AC; Data collection: NNS, AC, MEK, CS; Data analysis: GD, NNS, AC, MEK, CS; Draft preparation: GD, NNS, AC; Critical review for content: AD, SY, ÖB, GD, BD, CS, NNS, MEK, AC; Final approval of the version to be published: AD, SY, ÖB, GD, BD, CS, NNS, MEK, AC.*

Ethics approval ▪ Etik Kurul Onayı: *This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Faculty of Medicine/Clinical Research Ethics Committee (approval number: 2022/10). Written informed consent was obtained from all subjects/patients. ▪ Bu çalışma, Helsinki Deklarasyonu'nda belirtilen yönergelere uygun olarak gerçekleştirilmiş ve araştırma katılımcılarını içeren tüm prosedürler, Tıp Fakültesi/Klinik Araştırmalar Etik Kurulu tarafından onaylanmıştır (onay numarası: 2022/10). Tüm katılımcılardan/hastalardan yazılı bilgilendirilmiş onam alınmıştır.*

Conflict of interest ▪ Çıkar çatışması: *The authors declare that they have no conflict of interest. ▪ Yazarlar çıkar çatışması olmadığını beyan ederler.*

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