


Assessment of Eating Habits and Internet Addiction Levels Based on the Physical Activity Levels in University Students

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ABSTRACT

Aim: This study aims to identify eating behaviors and internet addiction levels of university students based on their physical activity levels.

Material and Methods: 775 university student subjects, aged 17 to 25 were enrolled to the study anthropometric measurements were recorded for all students. In the study Three-Factor Eating Questionnaire (TFEQ), The International Physical Activity Questionnaire (IPAQ) and Internet Addiction Scale were used. The eating habits and internet addiction levels of the students were statistically evaluated based on the physical activity levels. Physical activity level was calculated based on The "MET-minute/week" score was obtained by multiplying the values of minutes, days and MET.

Results: Evaluating the TFEQ results based on the physical activity levels, our study demonstrated that the uncontrolled ($p=0.047$) and emotional eating ($p=0.032$) scores of the inactive group were higher compared to the active group. Cognitive restraint of eating scores of the very active students, on the other hand, were higher compared to the inactive ($p=0.001$) and minimally active ($p=0.007$) students. Assessment of internet addiction scale based on physical activity levels showed that lack of control ($p=0.001$), desire to remain online more ($p=0.001$) and total internet addiction scores ($p=0.008$) were higher in inactive students compared to the other groups.

Conclusion: In this study, it was found that young people who do not do physical activity or do it at a minimum level show uncontrolled and emotional eating behavior. It was demonstrated that the desire to stay online and loss of control were higher in the same group.

Keywords: Eating behaviors; internet addiction; physical activity.

Üniversite Öğrencilerinin Yeme Alışkanlıklarının ve İnternet Bağımlılığı Düzeylerinin Fiziksel Aktivite Düzeylerine Göre Değerlendirilmesi

ÖZ

Amaç: Bu çalışma, üniversite öğrencilerinin yeme davranışlarını ve internet bağımlılığı düzeylerini fiziksel aktivite düzeylerine göre belirlemeyi amaçlamaktadır.

Gereç ve Yöntemler: Çalışmaya 17-25 yaşları arasında toplam 775 üniversite öğrencisi katılmıştır. Tüm öğrencilerin antropometrik ölçümleri kaydedilmiştir. Araştırmada, Üç Faktörlü Beslenme Anketi (TFEQ), Uluslararası Fiziksel Aktivite Anketi (IPAQ) ve İnternet Bağımlılığı Ölçeği kullanılmıştır. Öğrencilerin yeme alışkanlıkları ve internet bağımlılığı düzeyleri fiziksel aktivite düzeylerine göre istatistiksel olarak değerlendirilmiştir. Fiziksel aktivite düzeyi dakika, gün ve MET değerleri çarpılarak "MET-dakika / hafta" skoru elde edilmiştir.

Bulgular: Üniversite öğrencilerinin TFEQ sonuçlarını fiziksel aktivite düzeylerine göre değerlendiren çalışmamızda, inaktif (sedanter) grubun kontrolsüz ($p=0,047$) ve duygusal yemek yeme ($p=0,032$) skorlarının aktif gruba göre daha yüksek olduğu gösterilmiştir. Ayrıca, çok aktif öğrencilerin yemeyi bilinçli olarak kısıtlama skorları, inaktif ($p=0,001$) ve minimal olarak aktif ($p=0,007$) olan öğrencilere göre daha yüksek olduğu saptanmıştır. İnternet bağımlılığı ölçeğinin fiziksel aktivite düzeylerine göre değerlendirilmesi sonucunda, fiziksel olarak inaktif öğrencilerin kontrol eksikliğinin ($p=0,001$) ve çevrimiçi kalma arzusunun ($p=0,001$) daha fazla olduğu, toplam internet bağımlılığı puanlarının ($p=0,008$)

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da diğer gruplara göre daha yüksek olduğu saptanmıştır.

Sonuç: Bu çalışmada fiziksel aktivite yapmayan veya minimum düzeyde yapan gençlerin kontrolsüz ve duygusal yeme davranışı sergiledikleri bulunmuştur. Aynı grupta, internette çevrimiçi kalma isteği ve kontrol kaybının daha fazla olduğu gösterilmiştir.

Anahtar Kelimeler: Yeme davranışları; internet bağımlılığı; fiziksel aktivite.

INTRODUCTION

Healthy diet is defined as the fact that individuals consume nutrients in a sufficient and balanced way to protect their physical and mental health (1). Adequate and balanced nutrition is especially important in adolescents, but today it is seen that bad eating habits (irregular meals, skipping breakfast, eating between meals and excessive sweets) are very common in adolescents (2). Eating disorders have a negative effect on adolescents, and associated obesity causes diabetes, bone-joint disorders, and cardiovascular conditions (3,4).

Modern life developed around advances in technology caused a gradual decrease in daily physical activity in adolescents, leading to a sedentary lifestyle (5). A decrease in physical activity and a poor diet rich in saturated fat and sugar cause changes in anthropometric measurements of the adolescents, even being a guideline in associating these values with some diseases. Epidemiological evidence has shown that malnutrition and low physical activity can contribute to an increased risk of obesity (6,7).

Another factor leading to changes in nutrition and physical activity behaviors in adolescents is long-term internet use. As technology advances, the use of the internet in daily life increases day by day, to a degree of addiction especially in the adolescent population. It is known that this habit causes nutritional disorders and triggers obesity (8,9). In a study conducted on 437 children and adolescents, obese children and adolescents had higher rates of internet addiction compared to their peers in normal weight, and the results showed that there was a positive relationship between internet addiction and BMI (10).

Another study involving 135 young people is found that adolescents with obesity were more likely to have an internet addiction, lower quality of life, and higher daytime sleep (11). Adolescents have a limited time for physical activity when they use the internet for long periods of time. The nutritional behaviors change as the sedentary lifestyle becomes widespread, and this leads to metabolic diseases such as obesity, along with social and psychological problems (12). According to the data of the world health organization (WHO), more than 1.9 billion adults over the age of 18 are overweight in 2016, more than 650 million of them are obese. 340 million children and adolescents aged 5-19 are overweight or obese in 2016. 38 million children under the age of 5 are overweight or obese in 2019 (13). As obese children are likely to become obese adults (14).

The aim of this study is to evaluate the eating behaviors, physical activity conditions, and internet usage habits of university students with validity and reliability tests by considering anthropometric measurements and gender factors.

MATERIAL AND METHODS

Study groups

This study included 775 university student subjects, 498 female, 277 male, aged 17 to 25 who attended Istanbul Aydın University from 2018 to 2019. The study protocol complied with the ethical guideline for the 2013 Declaration of Helsinki and was approved by the Istanbul Aydın University Clinical Trials Ethics Committee (B.30.2.AYD.0.00.00.-480.2/127). Oral and written consents were obtained from the students, and study-related information was collected. Volunteer students between the ages of 17-25 and those who answered all questions in the questionnaires will be included in the study. Individuals under the age of 17 and over 25 and those who did not answer all the questions in the questionnaires will not be included in the study. The data collection forms were filled by face-to-face interview method so as not to affect the students' lessons. Anthropometric measurements (weight, height, arm-abdominal skinfold thickness, waist, arm, and neck circumference) of all participants were measured by researchers. According to the results of the prior power analysis using the G-Power program with 0.9891 power, 0.05 significance level, and 0.20 effects size, sample size was determined as 775 students.

Data collection

Anthropometric measurements

Anthropometric measurements identify individuals' body compositions and types, malnutrition or excessive eating, lack of exercise, and even their predisposition to diseases (15). The students' heights were measured after removing their shoes, and their weights were measured after removing jackets and other clothes and putting on gowns, using a standard weight and height measuring scale (G-Tech International, GL-150P, Korea). The anthropometric measures were calculated as body mass index (BMI) = Weight (kg) / Height² (m) (16). The students were classified as underweight, normal weighted, overweight, grade I obese, grade II obese and grade III obese based on their BMI parameters (17). Arm and abdominal skinfold thickness were measured using calipers. The abdominal area was measured vertically at 2 cm right of the umbilicus. The triceps measurements were taken vertically at the midpoint between the acromion and olecranon, with the subject's arm at a relaxed position (18). The mid-upper arm circumference (MUAC), neck, and waist circumferences of the students were measured using a standard measuring tape. The arm circumference was measured at the thickest part of the biceps, the neck circumference was measured right below the larynx, and the waist circumference was measured at the level of the umbilicus, at the subcostal area, when the subject was in a standing position with arms spread. All measurements were taken on the right side of the body, by the same person (19).

Assessment of the eating behaviors

This study employed the validation and reliability-tested "Three-factor Eating Questionnaire (TFEQ)" to evaluate the eating habits of the students (20, 21). This questionnaire allows for the measurement of cognitive restraint of eating, uncontrolled eating levels, and eating levels in emotional states. The questionnaire was first created as 51 questions, and after the validity and

reliability test of the questionnaire in various populations, it took its final form with 18 questions. Turkish validity and reliability test of the scale used in this study were performed (22).

Assessment of physical activity

The physical activity status of the students was measured using the validation and reliability tested short form of "The International Physical Activity Questionnaire (IPAQ)" (23, 24). The total score of the short form is calculated based on the total of walking, moderate-intensity activity, and vigorous-intensity activity time (minutes) and frequency (days). For IPAQ Short-Form calculations; minute, day, and MET (multiples of resting oxygen consumption) values were multiplied, giving the "MET-minute/week" score. Turkish validity and reliability test of the scale used in this study were performed (25)

Assessment of internet addiction level

Our study employed the validation and reliability tested "Skala zur Erfassung der Internetsucht" (Internet Addiction Scale) designed by Hahn and Jerusalem (26) to measure the internet addiction levels of the adolescents. The scale developed by Hahn and Jerusalem consists of a total of 20 questions and five factors with four questions in each factor. These factors are; loss of control, withdrawal symptoms, increased duration in addiction, negative results in work and productivity, negative consequences in social relationships. Turkish validity and reliability test of the scale used in this study were performed (27).

Statistical analysis

NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) program was used for statistical analyses. Descriptive statistics (mean, standard deviation, median, inter quantile range, frequency, minimum, maximum) were used in assessment of the study data. Compliance with the normal distribution of continuous variables was checked with Kolmogorov-Smirnov test. The Homogeneity of groups' variances was checked by Levene's test. If parametric test assumptions are available, two independent group means were compared by Student's t test and more than two independent group means were analyzed by One way ANOVA. Duncan test was used for multiple comparisons after ANOVA. Correlations between the variables were analyzed by Pearson correlation coefficient. If parametric test assumptions are not available, Mann Whitney U test was used for comparisons of two group's medians. Dunn test was used for multiple comparisons. Spearman rho correlation coefficient was used to evaluate the correlations. In order to determine relationships between categorical variables, Chi-square test was applied. p value <0.05 was considered statistically significant.

RESULTS

Study group and anthropometric measurements

This study included 775 university students, 64.3% female (n=498) and 35.7% male (n=277), The students were aged 17 to 25, the mean age was 20.15±2.02 years, and average BMI was 22.8 kg/m². Table 1 shows the anthropometric measurements of all students.

Three-factor eating questionnaire

TFEQ "uncontrolled eating" scores ranged from 5 to 20, and the mean score was 11.38±2.90; "emotional eating" scores ranged from 3 to 12, and the mean score was 6.51±2.64; "cognitive restraint of eating" scores ranged from 6 to 24, and the mean score was 14.24±3.65; "susceptibility to hunger" scores ranged from 4 to 16, and the mean score was 8.61±2.91. TFEQ total scores ranged from 21 to 62, and the mean score was 40.73±7.06. Total TFEQ's Cronbach's alpha coefficient was 0.712, and the measure can be considered as very reliable (22).

Total eating scores did not show any statistically significant difference in gender-based TFEQ assessment (p=0.056), the mean score in women was 41.02±7.11 and the mean score in men was 40.20±6.94 however, the emotional eating scores in women were statistically significantly higher than men (p=0.001). The mean score in women was 6.97±2.72 and the mean score in men was 5.68±2.29.

In women, there was no statistically significant difference between BMI waist circumference, abdominal and arm skinfold thickness measurements and uncontrolled eating (p=0.807; p=0.832; p=0.523; p=0.218) and susceptibility to hunger scores (p=0.566; p=0.389; p=0.180; p=0.603); however, there was a statistically significant positive association between BMI, emotional eating, cognitive restraint of eating and total eating scores (r=0.213; r=0.194; r=0.186; p=0.001). No statistically significant association was found between arm circumference and uncontrolled eating scores (p=0.218); however, a statistically significant positive association was shown between emotional eating (p=0.001), cognitive restraint of eating (r=0.212; r=0.174; r=0.100; r=0.232; p=0.001), susceptibility to hunger (p=0.001) and total eating (p=0.001) scores. No statistically significant association was found between neck circumference measurements and uncontrolled eating, cognitive restraint of eating and susceptibility to hunger (p=0.409; p=0.070; p=0.451); however, a statistically significant positive association was shown between emotional eating and total eating (r=0.121; p=0.007; r=0.116; p=0.010) scores.

In men, no statistically significant association was found between BMI and abdominal skinfold thickness and uncontrolled eating scores (p=0.126; p=0.420); however, a statistically significant positive association was shown between emotional eating (r=0.248; p=0.001), cognitive restraint of eating (r=0.333; p=0.001), susceptibility to hunger (r=0.161; p=0.007) and total eating; (r=0.366; p=0.001) scores. A statistically significant positive association was found between waist, neck circumference, arm skinfold thickness measurements and uncontrolled eating (r=0.125; p=0.038; r=0.124; p=0.039; r=0.122; p=0.042), emotional eating (r=0.235; p=0.001; r=0.218; p=0.001; r=0.206; p=0.001), cognitive restraint of eating (r=0.259; p=0.001; r=0.280; p=0.001; r=0.182; p=0.002), susceptibility to hunger (r=0.203; p=0.001; r=0.162; p=0.007; r=0.165; p=0.006) and total eating scores (r=0.354; p=0.001; r=0.342; p=0.001 r=0.286; p=0.001).

Table 1. Distributions of Anthropometric Measurements

Anthropometric Measurements		Total (n=775)	Female (n=498)	Male (n=277)
Height (cm)	Min-Max (Median)	142.2-193.8 (165.3)	146.8-179.8 (161.2)	142.2-193.8 (174.6)
	IQR	12.60	8.20	9.35
Weight (kg)	Min-Max (Median)	38.4-168.8 (62)	38.4-118.4 (58)	46.3-168.8 (72.7)
	IQR	18.50	14.21	17.85
BMI (kg/m ²)	Min-Max (Median)	15.4-51.1 (22.82)	15.9-45.6 (22.2)	15.4-51.1 (23.7)
	IQR	4.87	4.54	4.89
	Underweight	57 (%7.4)	44 (%8.8)	13 (%4.7)
	Normal weighted	503 (%64.9)	335 (%67.3)	168 (%60.6)
	Overweight	172 (%22.2)	102 (%20.5)	70 (%25.3)
	Obese Class I	31 (%4.0)	12 (%2.4)	19 (%6.9)
	Obese Class II	9 (%1.2)	3 (%0.6)	6 (%2.2)
	Obese Class III	3 (%0.4)	2 (%0.4)	1 (%0.4)
Waist circumference (cm)	Min-Max(Median)	54-142 (73)	54-109 (69)	58-142 (80)
	IQR	12	9.50	11
Arm circumference (cm)	Min-Max(Median)	18-44 (28)	18-42 (26.8)	20.5-44 (30)
	IQR	6	4.50	5
Neck circumference (cm)	Min-Max(Median)	23-48 (32)	23-40 (31)	26.5-48 (37)
	IQR	5.50	2	4
Abdominal skinfold thickness (mm)	Min-Max(Median)	4-74 (34)	7-74 (34)	4-74 (32)
	IQR	18	16	24
Triceps skinfold thickness (mm)	Min-Max(Median)	2-55 (12)	2-55 (16)	2-50 (8)
	IQR	12	10	9

SD: Standard deviation, IQR: inter quantile range, cm: centimeter, mm: millimeter; m: meter, kg: kilogram, min: minimum, max: maximum

The International Physical Activity Questionnaire

IPAQ results provided the data for vigorous physical activity, moderate physical activity, walking and sitting. The activity characteristics revealed that 21.7% (n=168) of the students were inactive, 40.8% (n=316) minimally active and 37.5% (n=291) were very active (Table 2).

BMI, waist circumference, arm circumference, neck circumference and abdominal-arm skinfold thickness did not show any statistically significant difference in women in terms of physical activity. A notable finding was that the arm circumference measurements of the very active group were higher than the other groups ($p=0.059$; $p>0.05$).

BMI measurements revealed a statistically significant difference ($p=0.008$) in men in terms of physical activity levels (mean score 25.67 ± 4.56). Pairwise comparisons performed to identify the source of the significant difference demonstrated that the measurements of the inactive students (mean score 26.16 ± 6.15) were higher than the minimally active (mean score 23.69 ± 3.49) ($p=0.007$) and very active (mean score 24.23 ± 4.16) ($p=0.029$) students. Measurements of the minimally active and very active students did not show any statistically significant difference ($p=0.15$). Waist circumference measurements (mean score 83.95 ± 12.32) revealed a statistically significant difference ($p=0.020$) in terms of physical activity levels.

Pairwise comparisons performed to identify the source of the significant difference demonstrated that the measurements of the inactive students (mean score 84.72 ± 13.42) were higher than the minimally active students (mean score 79.80 ± 7.52) ($p=0.018$). Other pairwise comparisons did not show any statistically significant difference ($p=0.078$). Arm and neck circumference measurements and abdominal and arm skinfold thickness did not show any statistically significant difference ($p=0.068$). A notable finding was

that the neck circumference measurements of the inactive group (mean score 34.11 ± 3.54) were higher than the other groups (mean score 32.73 ± 3.69) ($p=0.075$).

Internet Addiction Scale

Internet Addiction Scale "loss of control" scores ranged from 7 to 35, and the mean score was 17.74 ± 5.96 ; "desire to remain online more" scores ranged from 4 to 20, and the mean score was 10.14 ± 4.14 ; "negativity in social relations" scores ranged from 8 to 40, and the mean score was 13.40 ± 5.91 . Internet Addiction Scale total scores ranged from 19 to 95, and the mean score was 41.27 ± 13.81 . Cronbach's alpha coefficients of the sub-dimensions of the Internet Addiction Scale were 0.858, 0.875 and 0.888, respectively. Total Internet Addiction Scale Cronbach's alpha coefficient was 0.927, and the measure can be considered as highly reliable.

Loss of control (mean scores: women 17.71 ± 5.89 ; men 17.78 ± 6.10) and desire to remain online more (mean scores: women 10.08 ± 4.18 ; men 10.24 ± 4.08) scores did not show any statistically significant difference in terms of gender ($p=0.878$; $p=0.603$). Negativity in social relations (mean scores: women 12.60 ± 5.22 ; men 14.84 ± 6.76) scores ($p=0.001$) and total internet addiction ($p=0.022$) scores were statistically significantly higher in men (mean score: 40.39 ± 13.08) than women (mean score: 42.86 ± 14.94).

In men, no statistically significant association was found between BMI measurements ($p=0.076$) and negativity in social relations and total internet addiction scores ($r= -0.060$; $p=0.320$); however, there was a statistically significant negative association for the desire to remain online more ($r= -0.131$; $p=0.029$). No statistically significant association was found between waist-neck circumference and abdominal-arm skinfold thickness, and loss of control, desire to remain online more ($p=0.255$; $p=0.524$) and negativity in social relations scores in women ($r= -0.018$; $p=0.688$).

Table 2. The International Physical Activity Questionnaire Distributions

	Min-Max (Median)	Mean±SD
Number of vigorous physical activities (week/day)	0-7 (0)	1.16±1.59
Vigorous physical activities time (min)	0-480 (0)	42.55±61.01
Vigorous physical activities MET (min/week)	0-23520 (0)	870.86±1831.28
Number of moderate physical activities (week/day)	0-7 (0)	1.19±1.66
Moderate physical activities time (min)	0-960 (0)	43.97±72.13
Moderate physical activities MET (min/week)	0-26880 (0)	477.79±1385.04
Number of walking (week/day)	0-7 (6)	5.23±2.22
Walking time (min)	0-720 (60)	85.61±87.14
Walking MET (min/week)	0-16632 (1188)	1653.39±1915.88
Sitting time in last 7 days (min) (n=502)	120-1440 (345)	387.35±208.52
Total MET (min/week)	0-46872 (1999.5)	3002.04±3812.98
	n	%
Inactive	168	21.7
Minimal active	316	40.8
Very active	291	37.5

MET: Metabolic equivalent of task, SD: Standard deviation, Min: minimum, Max: maximum, min: minute

Table 3. Evaluation of Three Factor Nutrition Questionnaire and Internet Addiction Scale Scores According to Physical Activity Level

		Physical Activity Levels			Test value p
		Inactive (n=168)	Minimal active (n=316)	Very active (n=291)	
Three-factor eating questionnaire					
Uncontrolled eating	Mean±SD	11.85±2.93	11.19±2.84	11.30±2.92	F:3.002 0.049* ^a
Emotional eating	Mean±SD	6.78±2.71	6.72±2.65	6.13±2.56	F:4.990 0.007** ^b
Cognitive restraint of eating	Mean±SD	13.40±3.53	14.03±3.68	14.93±3.57	F:10.430 0.001** ^c
Susceptibility to hunger	Mean±SD	8.93±2.98	8.49±2.82	8.55±2.95	F:1.359 0.257 ^d
Total	Mean±SD	40.96±7.26	40.44±7.13	40.91±6.87	F:0.456 0.634 ^d
Internet Addiction Scale					
Loss of control	Mean±SD	19.14±6.10	17.71±5.88	16.95±5.85	F:7.271 0.001** ^e
Desire to remain online more	Mean±SD	11.07±4.12	10.14±4.17	9.60±4.04	F:6.748 0.001** ^e
Negativity in social relations	Mean±SD	13.92±6.00	13.00±5.58	13.53±6.19	F:1.451 0.235 ^f
Total	Mean±SD	44.13±13.54	40.85±13.58	40.08±14.04	F:4.856 0.008** ^e

One-Way ANOVA was performed between groups. Variables of significance; * $p < 0.05$, ** $p < 0.01$. SD: Standard deviation, p value: probability value

^a Uncontrolled eating scores of the inactive group were higher compared to the minimally active group

^b Emotional eating scores were also higher in the inactive and minimally active students compared to very active group

^c Cognitive restraint of eating scores in very active students were higher than minimally active students

^d Susceptibility to hunger and total eating scores did not show any statistically significant difference based on the physical activity levels

^e Loss of control, desire to remain online more and total internet addiction scores were higher in inactive students compared to minimally active and very active groups

^f Negativity in social relations scores did not show any statistically significant difference based on the physical activity levels.

Our study evaluated TFEQ and internet addiction scale scores separately based on the physical activity levels. Assessment of TFEQ results based on the physical activity levels did not show any statistically significant difference between uncontrolled eating scores ($p=0.049$). Pairwise comparisons performed to identify the source of the significant difference revealed that the scores of the inactive students were higher than the minimally active students ($p=0.047$). Other pairwise comparisons did not show any statistically significant difference ($p=0.128$). There was a statistically significant difference between emotional eating scores based on the physical activity levels ($p=0.007$). Pairwise comparisons performed to identify the source of the significant difference revealed that the scores of the inactive ($p=0.032$) and minimally active ($p=0.017$) students were higher than the very active students. Scores of the inactive and minimally active students did not show any statistically significant difference ($p=0.231$). There was a statistically significant difference between cognitive restraint of eating scores based on the physical activity levels ($p=0.001$). Pairwise comparisons performed to identify the source of the significant difference revealed that the measurements of the very active students were higher than the inactive ($p=0.001$) and minimally active ($p=0.007$) students. Scores of the inactive and minimally active students did not show any statistically significant difference ($p=0.137$). Susceptibility to hunger and total eating scores did not show any statistically significant difference based on the physical activity levels ($p=0.257$ Table 3). Assessment of internet addiction scale scores based on physical activity levels showed a statistically significant difference between lack of control ($p=0.001$), desire to remain online more ($p=0.001$) and total internet addiction scores ($p=0.008$). Pairwise comparisons performed to identify the source of the significant difference revealed that the scores of the inactive students were higher than the minimally active and very active students. Scores of the minimally active and very active students did not show any statistically significant difference (Table 3).

DISCUSSION

It is well-known that eating behaviors are a result of multidimensional events including emotional and behavioral components. Literature supports the association between BMI and certain eating behaviors (28,29). Our study employed Three-Factor Eating Questionnaire (TFEQ) to define eating behaviors of the university students. The questionnaire measures three domains of eating behavior: cognitive restraint (CR), uncontrolled eating (UE) and emotional eating (EE) (30). In addition to measuring these three factors, it was found that the questionnaire also evaluates the susceptibility to hunger levels (22). In our study, the relationship of these eating behaviors with BMI and anthropometric measurements was examined.

A study investigating the effects of emotional eating behaviors on the nutritional status in adults found out that the emotional eating scores were higher ($p<0.05$) in women (25). A study conducted on 2997 people using TFEQ showed that in adolescent and young adults, cognitive restraint and emotional eating scores increased as BMI values increased (23). Another study

demonstrated that in women, there was a positive association between the emotional eating scores and BMI, waist circumference, body fat percentage and depressive symptoms (26). A gender-based evaluation of the TFEQ scores revealed that although there was no difference in terms of the total eating scores ($p>0.05$), the emotional eating scores were higher in women compared to men ($p=0.001$; $p<0.01$). There was also a significant positive relationship between BMI, abdominal and arm skinfold thickness, waist, arm and neck circumference and emotional eating scores in women. Emotional eating is defined as the act of excessive eating in response to negative emotions such as anxiety or anger (31,32). The emotional eating scores in women are higher than man, which suggests that they use eating as a tool to cope with negative emotions. Excessive eating may be a way to alleviate negative emotions in the short term, but it possibly causes more emotional stress in the long term. Assessment of susceptibility to hunger scores did not show any association with the BMI, waist, arm and neck circumference, abdominal and arm skinfold thickness in women, but there was a significant association in men.

The study conducted by Kudaş et al. (33) demonstrated that there was a decrease in physical activity in teenagers and children, and the authors point out that this decrease is caused by the fact that television and computer have a significant place in young people's lives. We assessed IPAQ Short-Form results in our study and found out that 21.7% ($n=168$) of the students were physically inactive, 40.8% ($n=316$) were minimally active and 37.5% ($n=291$) were very active. This data shows that the university students are prone to a sedentary lifestyle (Table 2).

Our study also evaluated the loss of control, desire to remain online more and negativity in social relationships parameters in university students using the internet addiction scale. Gender-based assessment of the results demonstrated that the negativity in social relations and internet addiction scores were higher in man compared to women ($p=0.001$; $p=0.022$). A study investigating the association between internet addiction and gender reported that internet addiction is seen in men in a statistically significantly higher rate (34). The study reported that online gambling, online gaming and online pornography use is higher in men, thereby increasing the rate of addiction (35). Internet addiction leads to spending more time on devices such as computers and cellphones; and in return, the isolation process affects the social relations negatively. Assessment of anthropometric measures and internet addiction together did not show any significant association in women. However, it showed a significant negative association between the desire to remain online more and the BMI. Increase in the desire to remain online and the time spend in the virtual environment shows that the need to eat is postponed, which causes a decrease in the BMI values of the male students.

Evaluating the TFEQ results based on the physical activity levels, our study demonstrated that the uncontrolled eating scores of the inactive group were higher compared to the minimally active group ($p=0.047$). The emotional eating scores were also higher in the inactive ($p=0.032$) and minimally active ($p=0.017$)

students compared to very active ($p=0.012$) group. Cognitive restraint of eating scores in very active students were higher than the inactive ($p=0.001$) and minimally active ($p=0.007$) students. The results of this study are important in the sense that it was the first study to employ both questionnaires for evaluation in the young population. Studies investigating the association between exercise and mental health demonstrate that depression, anxiety, fatigue and cognitive disorders are more prevalent in people with an inactive or minimally active lifestyle (36-38). It was clearly shown that physical activity has a positive effect on the mental health and increases the ability to cope with stress (34). It is known that exercise maintains and improves health, and significantly reduces morbidity and mortality rates in chronic diseases as well as the risk of obesity. Rollins et al. defined eating in mood swing situations as “uncontrolled eating” (39). As demonstrated above, we believe that uncontrolled eating and emotional eating (40) are behaviors developed in response to negative emotions. Our study demonstrated that the uncontrolled eating and emotional eating scores were higher in the inactive group, and this result supports the association shown in the literature.

In our study group, assessment of internet addiction scale based on physical activity levels showed that lack of control ($p=0.001$), desire to remain online more ($p=0.001$) and total internet addiction scores ($p=0.008$) were higher in inactive students compared to minimally active and very active groups (Table 3). A study investigating the internet addiction results in young people showed that the level of addiction in people who are physically inactive was significantly higher than the people who are physically active, and students participating in any physical activity are more likely to stay away from devices with internet connection (41). Warbrick et al. (42) conducted a study to identify factors that would cause a decrease in physical activity, and they found out that internet was an important factor. Our study’s finding that internet addiction levels are higher in the inactive group compared to the active group conforms to the literature data.

CONCLUSION

In this study, it was found that young people who do not do physical activity or do it at a minimum level show uncontrolled and emotional eating behavior. It was observed that the desire to stay online and loss of control were higher in the same group.

Young people have a limited time for physical activity when they use internet for long periods of time. The nutritional behaviors change as the sedentary lifestyle becomes widespread.

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