Determinants of disordered eating behaviors: Body mass index, emotional eating, dietary restriction, and motives for eating palatable foods

Determinantes de comportamentos alimentares desordenados: índice de massa corporal, alimentação emocional, restrição alimentar e motivos para comer alimentos palatáveis

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ABSTRACT

Objective

The study aimed to investigate the relationships between body mass index, reasons for consuming palatable foods, emotional eating, cognitive dietary restraint, and disordered eating behaviors in young adults.

Methods

This study was conducted with 800 young adults, in Ankara, Türkiye. A questionnaire consisting of questions about socio-demographic characteristics, health status, and instruments including Eating Attitudes Test-26, Emotional Appetite Questionnaire, Palatable Eating Motives Scale, and The Three-Factor Eating Questionnaire were applied through face-to-face interviews.

Results

According to the Eating Attitudes Test-26, 17.2% of males and 27.7% of females were at risk for disordered eating behaviors (χ^2=9.750, p=0.002). The mean scores of the Three-Factor Eating Questionnaire-emotional eating, cognitive restraint subscales, and the positive and negative scores of the Emotional Appetite Questionnaire were higher in males than in females (p<0.05). The mean scores of the Palatable Eating Motives Scale-coping and reward enhancement motives were higher in females, while the mean score for the conformity motives was significantly higher in males. Body mass index, Three-Factor Eating Questionnaire-cognitive

restraint subscale, Emotional Appetite Questionnaire-negative, and PEMS-conformity motives were found for predictors for Eating Attitudes Test-26 (all $p<0.05$).

Conclusion

The results showed a high tendency for emotional eating, consumption of palatable foods, and cognitive dietary restraint in young adults, and these factors were considered determinants for eating disorders.

Keywords: Appetite regulations. Attitudes. Eating behavior. Eating disorders. Emotion.

RESUMO

Objetivo

O objetivo do estudo foi investigar as relações entre o índice de massa corporal, as razões para consumir alimentos palatáveis, o comer emocional, a restrição alimentar cognitiva e os comportamentos de desordem alimentar em jovens adultos.

Métodos

Este estudo foi realizado com 800 jovens adultos, em Ancara, na Turquia. Foi aplicado um questionário composto por perguntas sobre características sociodemográficas, estado de saúde e instrumentos, incluindo o Eating Attitudes Test-26, o Emotional Appetite Questionnaire, a Palatable Eating Motives Scale e o The Three-Fator Eating Questionnaire, através de entrevistas presenciais.

Resultados

De acordo com o Eating Attitudes Test-26, 17,2% dos homens e 27,7% das mulheres estavam em risco de desenvolver comportamentos alimentares desordenados ($\chi^2=9,750$, $p=0,002$). As pontuações médias do Three-Fator Eating Questionnaire-emotional eating, as subescalas de restrição cognitiva e as pontuações positivas e negativas do Emotional Appetite Questionnaire foram mais elevadas no sexo masculino do que no feminino ($p<0,05$). As pontuações médias da Palatable Eating Motives Scale - motivos de coping e de aumento da recompensa - foram mais elevadas no sexo feminino, enquanto a pontuação média para os motivos de conformidade foi significativamente mais elevada no sexo masculino. O índice de massa corporal, o Three-Fator Eating Questionnaire-subescala de contenção cognitiva, o Emotional Appetite Questionnaire-negativo e o PEMS-motores de conformidade foram encontrados como preditores do Eating Attitudes Test-26 (todos $p<0,05$).

Conclusão

Os resultados mostraram uma elevada tendência para a alimentação emocional, o consumo de alimentos palatáveis e a restrição alimentar cognitiva em adultos jovens, sendo estes factores considerados determinantes para as perturbações alimentares.

Palavras-chave: Regulamentos de apetite. Atitudes. Comportamento alimentar. Distúrbios alimentares. Emoção.

INTRODUCTION

The increase in the prevalence of obesity has become inevitable in today's world [1], where access to palatable foods that pave the way for energy intake to exceed energy expenditure, which is one of the basic equations of obesity, has become easier day by day and individuals' emotional states have turned into eating behaviors [2]. For nearly 100 years, it has been hypothesized that nutrition is not just an action to eliminate physical hunger. Previous studies have been designed to assess individuals' positive or negative emotional bonding with food [3], whether the consumption of palatable foods changes in response to certain emotions and situations [4], and the relationship of all these with obesity and disordered eating behaviors [5].

Eating disorders include many types such as pica, rumination disorder, avoidance/restrictive food intake disorder, anorexia nervosa, bulimia nervosa, and binge eating disorder according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) with the new title of Feeding and Eating Disorders that involve unhealthy control of body weight with a strong emphasis on body weight and body image [6]. Some individuals' dietary habits result in the restriction of certain

foods due to various emotional states or body image concerns, while others result in a tendency to consume palatable foods [7,4]. While individuals tend to restrict certain foods for body image anxiety and/or psychological satisfaction under different emotional states, some individuals feel an irresistible need to consume palatable foods [7,4]. Consumption of delicious and junk foods for reasons other than physiological hunger, and often instead of main meals, makes portion control of these foods difficult, as well as increasing the risk of obesity [8]. It is important to be aware of disordered eating behaviors because they indicate eating disorders. When an individual is struggling with an eating disorder, they generally engage in multiple behaviors with more frequency and intensity. The Academy of Nutrition and Dietetics [9] defines disordered eating attitudes and behaviors as a descriptive phrase, not a diagnosis. Frequent dieting, skipped meals, food restriction, fasting, high levels of anxiety about body image, and emotional eating are considered just a few of the signs and symptoms of disordered eating attitudes and behaviors [7,10]. Disordered eating attitudes and behaviors such as body image, excessive craving for palatable foods, and emotional eating are predominantly dominated by an inability to cope with emotions [10]. Therefore, it is suggested that assessing emotional eating is necessary for studies investigating the emergence and progression of disordered eating behavior [11]. Moreover, it is important to investigate all the underlying reasons for consuming of palatable foods other than physiological hunger, in addition to emotional eating, such as reward, social causes, and the body mass indices of individuals who shape their eating behavior for these reasons [12]. Young adulthood is a period in which interactions with people who grew up in different geographical regions generally increase leaving their families for reasons such as university and starting to work and start to establish their own diet. It is also known that unhealthy eating and disordered eating typically increases during this period [4,13,14]. For these reasons, it is important to conduct this research in young adults, as the underlying causes of young adults' diets and food choices directly affect obesity.

In this context, the current study aimed to investigate the relationships between Body Mass Index (BMI), disordered eating behavior, emotional eating, dietary cognitive restraint, and motives for eating palatable foods in young adults, in Ankara, Türkiye.

METHODS

This cross-sectional study was conducted on 800 young adult volunteers aged between 19 and 30 years living in Ankara, the capital of Türkiye. G*Power 3 software was used for the quantification of the target population size. This study would require a total of 356 subjects with 95% power at the 5% type I error (α) level to detect a minimum significant difference of 0.70 units in the Three-Factor Eating Questionnaire (TFEQ). The Type-2 error (β) level was 5%, and the effect size was 0.350. Participants with chronic diseases, pregnant or lactating individuals, and who left any of the scale questions blank were excluded from the research.

The study protocol was approved by the Ethical Committee of the Gazi University of Ankara/Türkiye (23/11/2021, Decision nº 2021-1064).

In the study, a questionnaire including socio-demographic characteristics and instruments including Eating Attitudes Test-26 (EAT-26), Emotional Appetite Questionnaire (EMAQ), Palatable Eating Motives Scale (PEMS), and The Three-Factor Eating Questionnaire (TFEQ) was applied by the researchers through a face-to-face interview. An interview took approximately 15 minutes to complete. Participants with chronic diseases, pregnant or lactating females, and who left any of the scale questions blank were excluded from the research. The number of individuals excluded from the study was 25.

The Eating Attitudes Test is used to identify and screen for eating disorders. Savaşır and Erol (1989) established the validity and reliability of the EAT-40 and adapted it to Turkish as a short version (EAT-26) [15]. The confidence coefficient (Cronbach's alpha) of EAT-26 was calculated as 0.770 in the study. The EAT-26 is a 6-point Likert scale with 26 items, and the total score is calculated by multiplying the answers with the scores between 0-3. The total score ranges from 0 to 78 points. Individuals with a score of ≥20 were considered as "at risk for disordered eating behavior", while those with a score of <20 are considered as "not at risk for disordered eating behavior" [16].

The EMAQ was developed by Nolan et al. (2010) [17] and performed validity and reliability of its Turkish version by Demirel et al. (2014) [18]. The confidence coefficient (Cronbach's alpha) was calculated as 0.863 in the study. In the EMAQ, which includes a total of 22 items, each item is scored with "much less" (1-4), "much more" (6-9) and "the same" (5) answers. The average of the responses to positive emotions and situations (8 items) constitutes the positive emotion and state score, and the average of the responses to negative emotions and situations (14 items) constitutes the negative emotion and state score. This scale, which does not have any cut-off points, evaluated in which emotions and situations especially emotional eating can be dominant [17].

The confidence coefficient (Cronbach's alpha) of the PEMS, developed by Boggiano (2016) [4], was calculated as 0.853 in the study, and the validity and reliability of the Turkish version were evaluated by And et al. [19]. The scale, which consists of 20 items and is evaluated with a 5-point Likert scale, evaluates a total of 4 different dimensions including social motives, coping motives, reward enhancement motives, and conformity motives. The scores for each motive are calculated by averaging the response values that include each motive. The increase in the individual's scale score reflects the power of the effect of the palatable foods on the individual (hedonic hunger) increases for non-metabolic reasons [4].

The shortened version of the Three-Factor Eating Questionnaire with 18 items (TFEQ-R18) [20], which is a new version of the original TFEQ with 51 items [21], has been widely used to describe eating behaviors in both clinical and general populations. The validity and reliability of the Turkish version were performed by Kırac et al. (2015) [22]. The confidence coefficient (Cronbach's alpha) was calculated as 0.712 in the study. In general, this scale measures an individual's level of dietary cognitive restraint and disinhibited eating. The TFEQ score, which is evaluated with a 4-point Likert and includes 18 items, is calculated by considering the responses given between 1 and 4 scores at the level of subscales (uncontrolled, emotional eating, and cognitive restraint). Cognitive restraint is composed of six items to assess conscious restriction of food intake to control body weight or promote weight loss. Uncontrolled eating is composed of 9 items and assesses the tendency to eat more than usual due to a loss of control over intake accompanied by subjective feelings of hunger. Emotional eating is composed of 3 items assessing the inability to resist emotional cues. Higher scores in the respective scales are indicative of greater cognitive restraint, uncontrolled, or emotional eating [22].

In this study, the participants' body weight (kg), height (cm), waist (cm) and neck circumference (cm) measurements were taken by the researchers. Body mass index (kg/m2), calculated by using body weight and height, was categorized according to the World Health Organization classification, and BMI evaluations of individuals were made for 4 groups including underweight, normal weight, overweight and obese. Waist-to-height ratios were calculated by dividing the waist circumference by height of the individuals.

The Kolmogorov-Smirnov test, histograms, detrended plots, and skewness or kurtosis were used to evaluate normality of data for continuous variables. Mean values, frequencies and ± Standard

Deviation (SD) were calculated to indicate the measures of central tendency and propagation, respectively. Student's t-test, Chi-square test, and linear regression testing were performed to determine mean values, compare characteristic features, and determine correlations between BMI variables, the TFEQ, EMAQ, PEMS subscales score according to EAT-26, respectively. The bivariate correlation of EAT-26 and TFEQ, EMAQ, PEMS subscales scores, were evaluated using Pearson's correlation adjusted for BMI and gender, with $p<0.05$ considered statistically significant. The Pearson correlation coefficients are presented from black to white with lighter colors being a weak correlation and darker colors being a strong correlation. Moreover, One-way ANOVA was conducted to test for the differences of EAT-26 and the TFEQ, EMAQ and PEMS subscales, according to BMI categories. When significant, the HSD post-hoc test was performed to locate the differences. All statistical data were analyzed using IBM® SPSS® (version 22.0).

RESULTS

Males' waist to height ratios, neck circumferences, and BMIs were higher than females' ($p<0.001$). The frequency of underweight was higher in females, and the frequency of overweight was higher in males ($p<0.001$). According to EAT-26, 17.2% of males and 27.7% of females were at risk for disordered eating behavior ($\chi^2=9.750$, $p=0.002$) (Table 1).

Table 1 – General characteristics of individuals. Ankara, Türkiye, 2022.

Characteristics of Individuals	Females (n=573)			Males (n=227)
Age (year) [±SD]	24.3±6.7			28.1±10.1
		$t=6.297$	$p<0.001$**	
Education status [n (%)]				
<4-year college	497 (86.9)			170 (74.9)
≥4-year college	75 (13.1)			57 (25.1)
		$\chi^2=16.963$	$p<0.001$**	
Marital status [n(%)]				
Single	487 (85.0)			155 (68.3)
Married	86 (15.0)			72 (31.7)
		$\chi^2=28.642$	$p<0.001$**	
Smoking status [n(%)]				
Yes	54 (9.4)			73 (32.2)
No	519 (90.6)			154 (67.8)
		$\chi^2=62.925$	$p<0.001$**	
Anthropometric measurement [±SD]				
BMI (kg/m²)	22.1±4.0			24.5±3.6
		$t=7.852$	$p<0.001$**	
Waist to height ratio	0.46±0.07			0.49±0.08
		$t=5.735$	$p<0.001$**	
Neck circumference (cm)	32.9±2.9			38.2±3.6
		$t=4.687$	$p<0.001$**	
BMI classification (kg/m²) [n(%)]				
Underweight	183 (31.9)[a]			21 (9.3)[b]
Normal weight	284 (49.6)[a]			109 (48.0)[a]
Overweight	74 (12.9)[a]			84 (37.0)[b]
Obese	32 (5.6)[a]			13 (5.7)[a]
		$\chi^2=80.674$	$p<0.001$**	
EAT-26 [n (%)]				
At risk for disordered eating behavior	159 (27.7)			39 (17.2)
No risk for disordered eating behavior	414 (72.3)			188 (82.8)
		$\chi^2=9.750$	$p=0.002$*	

Table 1 – General characteristics of individuals. Ankara, Türkiye, 2022.

Characteristics of Individuals	Females (n=573)			Males (n=227)
TFEQ [±SD]				
Uncontrolled eating	23.6±3.6			23.2±3.5
		t=-1.221	p=0.222	
Emotional eating	7.9±2.6			8.9±2.3
		t=5.326	p<0.001**	
Cognitive restraint	14.8±2.4			15.4±2.4
		t=3.389	p=0.001*	
EMAQ [±SD]				
EMAQ-positive	5.4±1.4			5.7±1.5
		t=2.601	p=0.009*	
EMAQ-negative	3.9±1.6			4.2±1.6
		t=2.294	p=0.022*	
PEMS [±SD]				
Social motives	2.7±0.9			2.5±0.8
		t=-1.587	p=0.113	
Coping motives	2.1±0.8			1.9±0.9
		t=-3.379	p=0.001*	
Reward enhancement motives	2.5±0.9			2.3±0.8
		t=-3.049	p=0.002*	
Conformity motives	1.5±0.5			1.6±0.6
		t=2.482	p=0.013*	

Note: All percentages are calculated on columns. *p<0.05; **p<0.001. [a,b]Represent the statistically significant differences among the line groups at p<0.05. BMI: Body Mass Index; EAT-26: Eating Attitudes Test-26; EMAQ: Emotional Appetite Questionnaire; PEMS: Palatable Eating Motives Scale; TFEQ: The Three-Factor Eating Questionnaire.

There was no statistical difference in the mean EAT-26 scores between BMI categories (Table 2). Negative EMAQ scores were significantly higher in the overweight/obese groups according to underweight (Table 2). In the study, all TFEQ subscale scores (uncontrolled eating, emotional eating, cognitive restraint) were significantly higher in the underweight group compared to the overweight group. In addition, in the study, TFEQ-cognitive restraint subscale score was significantly higher in the underweight group compared to all other BMI groups (Table 2). The PEMS-social motive scored higher than the other three PEMS motives and the social motive score was significantly higher in the underweight group according to the overweight group (2.8±0.9 vs 2.4±0.8, p=0.001) (Table 2).

Table 2 – Arithmetic mean (x̄) and standard deviation of scales according to BMI. Ankara, Türkiye, 2022.

Scales	Underweight (n=204)	Normal Weight (n=393)	Overweight (n=158)	Obese (n=45)	Total (N=800)	F	p
EAT-26	14.9±9.7	14.4±11.2	13.2±10.5	14.7±10.6	14.3±10.7	0.846	0.469
TFEQ							
Uncontrolled eating	23.6±3.7[a]	23.8±3.5[a]	22.6±3.8[b]	23.3±3.3[a,b]	23.5±3.6	4.183	0.006*
Emotional eating	8.4±2.5[a]	8.4±2.4[a]	7.6±2.8[b]	7.9±2.6[a,b]	8.2±2.6	4.433	0.004*
Cognitive restraint	15.6±2.6[a]	14.9±2.4[b]	14.4±2.1[b]	14.1±1.9[b]	14.9±2.4	10.438	0.000**
EMAQ							
Positive	5.6±1.5	5.4±1.4	5.5±1.4	5.4±1.4	5.5±1.5	1.433	0.232
Negative	3.7±1.5[a]	3.9±1.5[a,c]	4.5±1.8[b,c]	4.5±1.7[c]	4.0±1.6	9.017	<0.001**
PEMS							
Social motives	2.8±0.9[a]	2.6±0.8[a,b]	2.4±0.8[b]	2.5±0.8[a,b]	2.6±0.9	5.882	0.001*
Coping motives	2.1±0.8	2.0±0.8	2.2±1.1	1.9±0.8	2.1±0.9	2.738	0.053
Reward enhancement motives	2.5±0.9	2.5±0.9	2.4±0.8	2.3±0.7	2.5±0.9	1.591	0.190
Conformity motives	1.5±0.5	1.5±0.5	1.5±0.6	1.4±0.5	1.5±0.5	0.682	0.563

Note: *p<0.05; **p<0.001. [a,b,c]Represent the statistically significant differences among the line groups at p<0.05. BMI: Body Mass Index; EAT-26: Eating Attitudes Test-26; EMAQ: Emotional Appetite Questionnaire; PEMS: Palatable Eating Motives Scale; TFEQ: The Three-Factor Eating Questionnaire.

According to the multiple regression analysis, BMI, TFEQ-cognitive restraint scale, EMAQ-negative, and PEMS-conformity motives were the predictors for EAT-26 (all *p*<0.05; Table 3). BMI [B (SE)=-0.199 (0.092), *p*<0.05], EMAQ-negative [B (SE)=-0.946 (0.257), *p*<0.001], and TFEQ-cognitive restraint subscales [B (SE)=-1.170 (0.160), *p*<0.001] were predictor of EAT-26 negatively (Table 3). Additionally, conformity motives from the PEMS were positively predictor of EAT-26 [B (SE)=3.189 (0.732), *p*<0.001, as shown in Table 3]. The bivariate correlation coefficients of EAT-26 and subscales of TFEQ, EMAQ, and PEMS scores (adjusted for BMI and gender) are shown in Table 4. All TFEQ subscales were negatively correlated with EMAQ-negative and PEMS subscales (all *p*<0.05). EMAQ- showed a positive correlation with PEMS subscales (all *p*<0.05 (Table 4). A significant negative correlation was found between the negative score of EMAQ and the total score of EAT-26 (r=-0.084 *p*<0.05, adjusted for BMI and gender (Table 4). The TFEQ-cognitive restraint score was significantly lower in male and female individuals at risk for disordered eating behavior compared to those without risk of disordered eating behavior (Male: 2.3±0.5 vs 2.6±0.4, *p*<0.001; Female: 2.4±0.4 vs 2.5±0.4, *p*<0.001, data not shown). The EAT-26 total score and PEMS-reward enhancement and PEMS-conformity motives scores were positively correlated (respectively, r=0.078, *p*<0.05 and r=0.202, *p*<0.001; adjusted for BMI and gender (Table 4).

Table 3 – Multiple regression models as predictors of the score in EAT-26. Ankara, Türkiye, 2022.

Variables	B (SE)	β	t	p	R	R²	F
Constant	42.785 (5.122)		8.353	0.000**	0.355	0.126	11.331
BMI	-0.199 (0.092)	-0.075	-2.154	0.032*			
TFEQ							
Uncontrolled eating	-0.217 (0.115)	-0.073	-1.888	0.059			
Emotional eating	-0.085 (0.180)	-0.020	-0.472	0.637			
Cognitive restraint	-1.170 (0.160)	-0.0261	-7.305	0.000**			
EMAQ							
Positive	-0.154 (0.264)	-0.021	-0.582	0.560			
Negative	-0.946 (0.257)	-0.139	-3.675	0.000**			
PEMS							
Social motives	-0.708 (0.543)	-0.057	-1.304	0.193			
Coping motives	-0.189 (0.546)	-0.015	-0.346	0.730			
Reward enhancement motives	0.622 (0.593)	0.050	1.048	0.295			
Conformity motives	3.189 (0.732)	0.157	4.355	0.000**			

Note: *p<0.05; **p<0.001. BMI: Body Mass Index; EAT-26: Eating Attitudes Test-26; EMAQ: Emotional Appetite Questionnaire; PEMS: Palatable Eating Motives Scale; SE: Standard error; TFEQ: The Three-Factor Eating Questionnaire. Constant EAT-26, *Predictors* BMI, subscales of TFEQ, EMAQ and PEMS.

Table 4 – Bivariate correlation coefficients among the scores of EAT-26, subscales and subdimensions of the TFEQ, EMAQ, and PEMS. Ankara, Türkiye, 2022.

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Scales	TFEQ			EMAQ		PEMS			
	Uncontrolled eating	Emotional eating	Cognitive restraint	Positive	Negative	Social motives	Coping motives	Reward enhancement motives	Conformity motives
TFEQ									
Emotional eating	0.416**								
Cognitive restraint	0.178**	0.251**							
EMAQ									
Positive	-0.142**	-0.021	0.043						
Negative	-0.150**	-0.390**	-0.111*	0.193**					

Table 4 – Bivariate correlation coefficients among the scores of EAT-26, subscales and subdimensions of the TFEQ, EMAQ, and PEMS. Ankara, Türkiye, 2022.

Scales	TFEQ			EMAQ		PEMS			
	Uncontrolled eating	Emotional eating	Cognitive restraint	Positive	Negative	Social motives	Coping motives	Reward enhancement motives	Conformity motives
PEMS									
Social motives	-0.199**	-0.171**	-0.114**	0.201**	0.011				
Coping motives	-0.303**	-0.453**	-0.161**	0.107**	0.246**	0.382**			
Reward enhancement motives	-0.360**	-0.266**	-0.107*	0.240**	0.122**	0.601**	0.531**		
Conformity motives	-0.191**	-0.110*	-0.128**	0.030	0.038	0.311**	0.275**	0.268**	
EAT-26	-0.137**	-0.052	-0.257**	-0.034	-0.084*	0.055	0.057	0.078*	0.202**

Note: *$p<0.05$; **$p<0.001$, adjusted for BMI and gender. BMI: Body Mass Index; EAT-26: Eating Attitudes Test-26; EMAQ: Emotional Appetite Questionnaire; PEMS: Palatable Eating Motives Scale; TFEQ: Three-Factor Eating Questionnaire.

DISCUSSION

In the present study, it was found that emotional eating, the consumption of palatable food for reasons other than hunger, and the tendency to cognitively restrict food consumption are higher in young adults, and these factors are predictors for disordered eating behavior. It was determined that there are relationships between the sub-dimensions of the scales used in the study, and the scores of these sub-dimensions differ according to BMI groups, which supports the study's hypotheses.

In one study, it was found that 51.8% of males and 31.3% of females were at risk among university students [23]. In another study, the prevalence of eating disorders in female students was higher than in males (47.6% vs 33.3%), which indicates 3.285 times higher risk of eating disorders in females [24]. In a recent study, investigating the risk of disordered eating attitudes and behaviors among university students in Bangladeshi, the frequency of disordered eating behavior, determined using EAT-26, was 17.2% for males and 23.5% for females [25]. Consistent with previous studies, in the study, 17.2% of males and 27.7% of females were at risk for disordered eating attitudes and behaviors. It has been reported that the mentioned difference between the sexes in terms of disordered eating behavior may be caused by physiological factors such as hypothalamic-pituitary-gonadal function or by some psychological factors such as the person's body image perception [26].

Various other studies in different countries have shown a positive association between overweight/obesity and disordered eating attitudes and behaviors [25,27]. In the study, contrary to those studies mentioned [25,27], no significant relationship was found between BMI, overweight/obesity and disordered eating attitudes and behaviors measured by EAT-26. In addition, as seen in the results, the prevalence of disordered eating attitudes and behaviors in the overweight group is higher in men, while the prevalence in the underweight group is higher in women, although not statistically significant. The increase in the prevalence of disordered eating attitudes and behaviors seen in men in the overweight group is similar with the study conducted by Al Banna et al. (2021) [25]. Also, in the study, according to multiple regression analysis, with one unit decrease in BMI, disordered eating attitudes and behaviors increases by 0.199 units. Given the contrasting findings observed in various studies, it is recommended that future research include larger, nationally representative samples and examine the longitudinal association between young adults' body weight status and the risk of disordered eating attitudes and behaviors [25].

In the study, as in the original study of the scale [17], a significant positive correlation was found between the negative total score of the EMAQ and BMI in the study (r=0.186 *p*<0.001, data not shown). It can be said that overweight/obese individuals perform more emotional eating in negative emotions and situations compared to underweight individuals. Findings showing that individuals with higher BMI exhibit more eating behavior when they experience a negative emotion can be explained by emotion regulation processes [18]. In the study, EMAQ-negative were found to be a predictor of EAT-26 negatively, in addition, a significant negative correlation was found between EMAQ-negative score and EAT-26 total score. The higher EAT-26 total score emphasizes the possibility of situations in which eating behavior is restricted (such as anorexia nervosa).

In the study, the TFEQ-cognitive restraint subscale score was significantly higher in the underweight group compared to all other BMI groups. It is thought that individuals in the underweight group (women constituted 90% of the underweight group) are more likely than other BMI groups to consciously control their eating habits to maintain or reduce body weight [22,28]. Contrary to this finding, cognitive restraint has also been associated with weight gain, as it can lead to increased hunger and appetite, leading to an intense sense of deprivation and possible abandonment of dietary restrictions [29]. Restrained eaters may experience problems with eating regulation, which can lead to emotional eating and vulnerability to binge eating [29]. The direction of the relationship between cognitive restraint (also called as dietary restraint) and BMI may vary in a community-specific manner [30]: in a clinical sample of obese adults, cognitive restraint was inversely associated with BMI, whereas in another study, the association was positive [31]. Energy restriction is prominently observed in eating disorders such as anorexia nervosa, bulimia nervosa (especially in a non-binge meal). "Dietary restraint" differs from "energy restriction" in that it refers to the intention to restrict the amount consumed to achieve the desired body weight. Dietary restraint is also increasing in individuals with eating disorders [32]. In a study of 183 patients diagnosed with anorexia and bulimia nervosa, the TFEQ-restraint scale was reported to be a useful tool for dietary restraint, and TFEQ-restraint scores can be classified from high to low as follows: anorectic patients, bulimic patients, and healthy controls, respectively [32]. Contrary to this finding, in the study, the mean TFEQ-cognitive restraint score was significantly lower in individuals at risk for disordered eating behavior compared to those without disordered eating behavior, according to EAT-26. As a supporting for the finding, in the study, TFEQ-cognitive restraint subscale was found to be a negative predictor of EAT-26. Due to the conflicting results regarding the use of the TFEQ-cognitive restraint subscale, which is stated as a valid measurement tool in individuals with an eating disorder diagnosis, in healthy individuals, further research is recommended.

It has been emphasized that palatable foods can create addiction-like deficits in brain reward function and lead to overeating and obesity [33]. Social motive was the highest scoring motive among PEMS-related motives and was not associated with obesity or overeating. This is in line with the tradition of pairing palatable foods with social gatherings, especially among young adults [34]. Also, the social motive should score higher than the other three PEMS motives since all the three motives other than the social motive can be specified as unhealthy reasons for eating these palatable foods [4]. In the study, as expected, the social motive scored higher than the other three PEMS motives. It has been reported that the level of palatable foods consumption induced by social reasons is significantly higher in overweight/obese subjects compared to underweight subjects [35]. In contrast to this finding, in the study, PEMS-social motivation score was significantly higher in underweight group compared to overweight group. It can be said that underweight individuals consume more delicious foods and beverages for social reasons (to have fun at a party and socialize more with friends, etc.) compared to the overweight group. Also, in the study, unlike all other subscales, PEMS-

conformity motives were positive and statistically significantly of EAT-26. Based on the findings of the study, it is thought that it is very important to plan and implement awareness-raising programs throughout the young population, targeting all individuals who are at risk for the development of disordered eating behaviors, especially overweight/obese males, and underweight females, to prevent the emergence of negative health outcomes. For example, the opening of elective courses such as "healthy nutrition, nutrition in eating disorders, obesity and nutrition, underweight and nutrition" starting from the high school age and university period which is the beginning of young adulthood can be encouraged at national level. The nutritional problems mentioned are dangerous as they can cause physical and mental health problems [36]. Workplaces that mostly employ young adults can take initiatives to increase their employees' awareness of disordered eating attitudes and behaviors and eating disorders by seeking counseling from experts such as doctors and dietitians.

There are some limitations in this study. The cross-sectional nature of the study constitutes a limitation, so the results cannot be generalized since only young people from Ankara constitute the universe of the study. Another limitation of the study is that various situations that can increase the risk of eating disorders by changing in food preferences and eating patterns of the individuals (income level, whether there is a cafeteria service at the workplace and whether these food services are offered at affordable prices, whether there is healthy food in the food vending machines at the workplace, etc.), were not questioned.

CONCLUSION

Emotional eating, palatable food consumption for reasons other than hunger, and the tendency to restrict food consumption cognitively are higher in young adults, and these factors have been shown to be the predictors for disordered eating behavior. Potential strategies to help reduce the development of eating disorders can be stated as (i) screening high school and campus-wide students starting from the adolescence period, which is considered the onset of eating disorders, (ii) raising awareness about eating disorders, (iii) promoting healthy eating habits at each stage of the life cycle, especially in young adulthood (iv) encouraging overweight/obese individuals to lose weight, and (v) ensuring that underweight individuals reach healthy body weight. To better understand the complex nature of eating disorders, further studies should be conducted with young adults.

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