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Examining the relationship between obesogenic environment, eating behaviors and food consumption in adults: A community-based study from Türkiye

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ABSTRACT

Introduction: The obesogenic environment, characterized by the prevalence of high-calorie foods and sedentary lifestyles, plays a crucial role in the global rise of obesity. This environment influences eating behaviors, including uncontrolled eating, emotional eating, and cognitive restraint, which in turn affect weight management and health outcomes. Understanding the interplay between environmental factors, eating behaviors, and food consumption is vital to addressing obesity.

Materials and methods: This cross-sectional study included 1.878 adults aged 19-65 years in Turkey. Data were collected via an online survey assessing demographics, anthropometric measurements, eating behaviors, and food consumption patterns. The three-factor eating questionnaire and the obesogenic environment scale were used to evaluate eating behaviors and environmental influences, respectively. Statistical analyses included correlation and regression methods to examine relationships among variables.

Results: It was determined that the obesogenic environment scale total score had an effect on uncontrolled eating and emotional eating. There was a statistically significant positive correlation between body mass index and uncontrolled eating, cognitive restriction and emotional eating. It was determined that as the total scores of uncontrolled eating, cognitive restriction, emotional eating and the obesogenic environment scale increased, the frequency of consumption of unhealthy foods (fast food and packaged foods) and sugary drinks increased.

Conclusion: The obesogenic environment promotes unhealthy eating behaviors, contributing to weight gain and obesity. Strategies to mitigate these effects include public health policies aimed at improving access to healthy foods and increasing awareness of nutrition. This study underscores the importance of addressing environmental factors in obesity prevention efforts.

Keywords: obesogenic environment, uncontrolled eating, emotional eating, food consumption frequency, adults

INTRODUCTION

The obesogenic environment which is characterized by intake of high-calorie foods, sedentary lifestyles, and a lack of access to healthier options, is becoming a key determinant of public health outcome [1, 2]. Obesogenic environment forces behaviors that promote excessive caloric intake and limited physical activity and causing obesity rates to increase globally. The availability and marketing influence of energy-dense, nutrient-poor foods, coupled with social and economic factors, make it challenging for individuals to make healthy food choices. This complex relationship between environmental factors and personal lifestyle choices significantly influences eating behaviors and this situation may play an important role in obesity development [3, 4].

Eating behavior refers to the patterns and decisions individuals make regarding their food consumption, including what, when, and how much they eat. These behaviors are influenced by physiological, psychological, social, and environmental factors [5]. Eating behavior can be divided into three main subdimensions: uncontrolled eating, emotional eating, and cognitive restraint. Eating in response to external cues or a perceived lack of control over food intake is known as uncontrolled eating, often driven by hunger or the availability of palatable foods [6]. Emotional eating comprises eating in reaction to negative feelings such as sadness, stress, or boredom instead of physical hunger [7]. Emotional eating has also been shown to be significantly correlated with symptoms of depression, as demonstrated in recent studies on young adults [8]. Lastly, cognitive restraint allude to the conscious restriction of food consumption in an attempt to control body mass [9]. Each of these subdimensions plays a significant role in determining overall eating behavior and is associated with specific health outcomes, particularly with weight management and obesity [10].

The interaction between the obesogenic environment and eating behaviors is a critical area of research, with several studies highlighting the influence of environmental cues on eating habits. For instance, research has shown that individuals living in obesogenic environments have greater access to unhealthy food selections and are more inclined to participate in unhealthy eating habits, such as increased consumption of fast food and sugary beverages [1, 4]. Furthermore, studies have demonstrated that exposure to obesogenic environments is related to higher scores on measures of emotional eating and uncontrolled eating, which can lead to an increased risk of obesity [2, 10]. These findings underline the role of environmental factors in establishing dietary choices and emphasize the importance of addressing the broader context in which eating behaviors occur to effectively combat obesity [5].

This study targets to investigate the relationship between the obesogenic environment, eating behaviors, and food consumption among adults in Turkey. By using a cross-sectional design, this study aims to shed light on the ways in which environmental influences affect eating habits and contribute to obesity. Specifically, it aims to examine the correlations between the obesogenic environment scale scores, three-factor eating questionnaire scores (including uncontrolled eating, cognitive restraint, and emotional eating), and food consumption. Understanding these relationships can help inform public health strategies aimed at mitigating the negative impact of obesogenic environments and promoting healthier lifestyles.

MATERIALS AND METHODS

This cross-sectional and descriptive study involved 1,878 adults aged 19 to 65 years, conducted between December 2023 to June 2024. The research data were collected via a web-based survey form (Google Form) created by the researchers and taken from the Ankara province of Turkey using the snowball sampling method. Survey data were collected via social media tools Twitter, Facebook, WhatsApp and Instagram. Since the study aimed to reach a large sample, snowball sampling and online data collection methods were preferred. The inclusion criteria for the study were, as follows: individuals aged between 18 and 65 years, with internet access, who ticked the "I agree to participate in this study voluntarily" tab at the beginning of the online survey, and who completed the survey in its entirety were included in the study. Prior to the study's initiation, ethical approval was obtained from the Trakya University Faculty of Medicine Dean's Office of Ethics Committee for Non-Invasive Scientific Research, under decision number 18/09. All study procedures adhered to the Declaration of Helsinki. The questionnaire collected data on demographic factors (including gender, age, and educational background), anthropometric measurements (body weight and height), the obesogenic environment, eating behaviors, and food consumption patterns.

Eating Behaviors

Three-factor eating questionnaire was used to evaluate eating behaviors. The reliability and validity analysis of the scale within the Turkish context was conducted in [6]. The scale comprises 21 questions divided into three subdimensions. Scale subdimensions like uncontrolled eating, cognitive restriction, and emotional eating. Cronbach's alpha values of the sub-factors are 0.801, 0.870, and 0.787 for cognitive restriction, emotional eating, and uncontrolled eating, respectively. Uncontrolled eating is defined as a loss of control during eating, which may be triggered by hunger or external stimuli. The minimum score obtainable from this subdimension is 9, while the maximum score is 36. Cognitive restriction refers to the deliberate restriction of food intake to control body shape and weight. The minimum score that can be obtained for this subdimension is 6, and the maximum score is 24. Emotional eating evaluates instances of overeating in response to negative emotional states, such as anger, sadness, and stress. The minimum score achievable in this subdimension is 6, while the maximum score is 24. A high score in any subfactor of the scale indicates a pronounced eating behavior associated with that particular factor.

Food Consumption

Individuals' food consumption was determined using the food consumption frequency form created by the authors. The form questioned individuals' consumption habits in the last year.

Anthropometric Measurements

Anthropometric data, including self-reported body weight and height, were collected. Participants were provided with detailed instructions within the questionnaire to ensure accurate self-measurements. The body mass index (BMI) was calculated by dividing body weight (in kilograms) by the square of height (in meters). A BMI of less than 18.50 kg/m^2 was classified as underweight, 18.50-24.99 kg/m^2 as normal weight, 25.00-29.99 kg/m^2 as overweight, and 30.00 kg/m^2 or higher as obese [11].

Obesogenic Environment

The obesogenic environment was assessed with the obesogenic environment scale. The scale was developed in [12] and its reliability and validity were established. The Cronbach's alpha coefficient of the scale is 0.76. It consists of a total of 4 sub-dimensions and 32 questions. The sub-dimensions included in the scale are factors regarding the physical environment and opportunities, cultural determinants and access to exper, social determinants and their effects, and economic determinants and their effects. The scale is 7-likert type. Individuals are asked to give points from 1 to 7 for each item of the scale questions. It is expressed as 1-I do not agree (healthy factor), 4-partly agree, 7-strongly agree (obesogenic factor). There is no specific cutoff point for evaluation. Higher scores from the scale indicate increased obesogenic factors.

Statistical Analysis

A post-hoc power analysis was performed using G*Power (version 3.1.9.7, Universität Düsseldorf, Düsseldorf, Germany), and the effect size was calculated for the correlation between the obesogenic environment scale score and the uncontrolled eating score. The analysis revealed that the study power (1-β) was 99% for a two-sided alpha level of 5%.

All analyses were conducted using the statistical package for social sciences (version 22.0). The data were evaluated using descriptive statistics, including the mean, standard deviation, frequency, and percentage. Descriptive statistics were categorized into four tertiles based on the obesogenic environment scale score. Chi-square analysis was employed to

compare qualitative data and identify differences between groups, while the Kruskal-Wallis test was utilized for comparisons among independent groups. Bonferroni correction was applied to adjust for multiple pairwise comparisons. Relationships between variables were assessed using the Spearman correlation coefficient. Regression analysis was conducted to predict eating behaviors. In the simple linear regression analysis, variables that were not normally distributed were logarithmically transformed to more closely align with a normal distribution. A p-value below 0.05 was interpreted as statistically significant.

RESULTS

The general characteristics of the participants are shown in **Table 1**. The mean age of the participants was 26.7 ± 10.75 years, and the mean BMI was 23.3 ± 4.36 kg/m^2. The majority of participants (65.7%) were university graduates. According to BMI classification, 62.8% of individuals were classified as normal weight, while 20.5% were overweight and 7.5% were classified as obese.

Evaluation of the relationship between eating behaviors and some variables was given in **Table 2**. While there was a statistically significant negative correlation between uncontrolled eating and age, and between emotional eating and age, a positive significant correlation was found between cognitive restriction and age.

A positive and significant correlation was found between all eating behaviors and body weight and BMI. There was a positive and significant correlation between all eating behaviors and the obesogenic environment scale subdimensions' scores (except cultural determinants and access to exper) and the obesogenic environment scale total score.

When evaluating the factors that could affect the three-factor eating questionnaire' subdimension scores using linear regression analysis, all models were found to be significant (R^2 = 0.354; p < 0.001, R^2 = 0.289; p < 0.001, R^2 = 0.407; p < 0.001). It was determined age, BMI and the obesogenic environment scale total score had effect on uncontrolled eating. It was determined gender and BMI had effect on cognitive restriction (p < 0.05). It was determined age, gender, BMI and the obesogenic environment scale total score had effect on emotional eating (p < 0.05) (**Table 3**).

Table 1. General characteristics of individuals

Variables	N (%)
Gender	
Female	1,345 (71.6)
Male	533 (28.4)
Education level	
Primary school	59 (3.1)
Middle school	42 (2.2)
High school	449 (23.9)
University	1,234 (65.7)
Master's degree/PhD	94 (5.0)
BMI classification	
Underweight (< 18.50 kg/m^2)	174 (9.3)
Normal (18.50-24.99 kg/m^2)	1,179 (62.8)
Overweight (25.00-29.99 kg/m^2)	385 (20.5)
Obese (≥ 30.0 kg/m^2)	140 (7.5)
	M ± SD
Age (years)	26.70 ± 10.75
BMI (kg/m^2)	23.30 ± 4.36
TFEQ subdimensions	
Uncontrolled eating	20.30 ± 6.10
Cognitive restriction	13.10 ± 4.26
Emotional eating	12.60 ± 5.06
The obesogenic environment scale subdimensions	
Factors regarding PE and opportunities	41.60 ± 11.23
Cultural determinants and access to exper	36.90 ± 13.37
Social determinants and their effects	29.80 ± 10.17
Economic determinants and their effects	17.60 ± 7.76
The obesogenic environment scale total score	126.00 ± 20.45

Note. M: Mean; SD: Standard deviation; & PE: Physical environment

Table 2. Evaluation of the relationship between eating behaviors and some variables

Variables	TFEQ subdimensions		
	Uncontrolled eating	Cognitive restriction	Emotional eating
Age (years)	r = -0.159 & p < 0.001*	r = 0.141 & p < 0.001*	r = -0.130 & p < 0.001*
Education level	r = 0.027 & p = 0.246	r = 0.005 & p = 0.820	r = 0.008 & p = 0.796
Body weight (kg)	r = 0.143 & p < 0.001*	r = 0.116 & p < 0.001*	r = 0.112 & p < 0.001*
BMI (kg/m^2)	r = 0.139 & p < 0.001*	r = 0.220 & p < 0.001*	r = 0.181 & p < 0.001*
The obesogenic environment scale subdimensions			
Factors regarding physical environment and opportunities	r = 0.168 & p < 0.001*	r = 0.120 & p < 0.001*	r = 0.147 & p < 0.001*
Cultural determinants and access to exper	r = 0.071 & p = 0.486	r = 0.037 & p < 0.121	r = 0.044 & p = 0.054
Social determinants and their effects	r = 0.260 & p < 0.001*	r = 0.130 & p < 0.001*	r = 0.229 & p < 0.001*
Economic determinants and their effects	r = 0.158 & p < 0.001*	r = 0.124 & p < 0.001*	r = 0.121 & p < 0.001*
The obesogenic environment scale total score	r = 0.235 & p < 0.001*	r = 0.077 & p = 0.001*	r = 0.211 & p < 0.001*

Note. Spearman correlation & *p < 0.05

Table 3. Linear regression model for eating behaviors prediction

Model	TFEQ subdimensions								
	Uncontrolled eating			Cognitive restriction			Emotional eating		
	Beta	t	p-value	Beta	t	p-value	Beta	t	p-value
Age (years)	-0.260	-10.591	< 0.001*	0.047	1.858	0.063	-0.261	-10.887	< 0.001*
Gender	-0.019	-0.849	0.396	-0.178	-7.850	< 0.001*	-0.210	-9.735	< 0.001*
BMI (kg/m^2)	0.256	10.291	< 0.001*	0.230	9.025	< 0.001*	0.336	13.799	< 0.001*
The obesogenic environment scale total score	0.204	9.327	< 0.001*	0.037	1.653	0.099	0.159	7.458	< 0.001*
	R^2 = 0.354 & p< 0.001*			R^2 = 0.289 & p < 0.001*			R^2 = 0.407 & p < 0.001*		

Note. Variable values: Gender (male = 1 & female = 0) & *p < 0.05

Table 4. Evaluation of demographic characteristics and obesity status according to quartile categories of the obesogenic environment scale total score

Variables	The obesogenic environment scale total score				
	Q1 (32-112)	Q2 (113-127)	Q3 (128-141)	Q4 (142-200)	Statistical analysis
N (%)	476 (25.3)	494 (26.3)	444 (23.6)	464 (24.7)	
Age (years)	28.90 ± 12.11[a]	25.1 ± 9.68[b]	25.90 ± 9.91[b]	26.80 ± 10.76[b]	p < 0.001*[1]
Gender					
Female	319 (67.0)	338 (68.4)	324 (73.0)	364 (78.4)	χ^2 = 18.492 & **p < 0.001***[2]
Male	157 (33.0)	156 (31.6)	120 (27.0)	100 (21.6)	
Education level					
Primary school	26 (5.5)	14 (2.8)	12 (2.7)	7 (1.5)	χ^2 =18.386 & p = 0.104[2]
Middle school	14 (2.9)	8 (1.6)	12 (2.7)	8 (1.7)	
High school	116 (24.4)	113 (22.9)	106 (23.9)	114 (24.6)	
University	296 (62.2)	337 (68.2)	288 (64.9)	313 (67.5)	
Master's degree/PhD	24 (5.0)	22 (4.5)	26 (5.9)	22 (4.7)	
BMI (kg/m^2)	23.30 ± 4.36	22.80 ± 4.27[a]	23.60 ± 4.33[b]	23.50 ± 4.46[b]	p = 0.004*[1]
BMI classification					
Underweight (< 18.50 kg/m^2)	48 (10.1)	49 (9.9)	43 (9.7)	34 (7.3)	χ^2 = 11.851 & p = 0.222[2]
Normal (18.50-24.99 kg/m^2)	290 (60.9)	329 (66.6)	262 (59.0)	298 (64.2)	
Overweight (25.00-29.99 kg/m^2)	102 (21.4)	89 (18.0)	101 (22.7)	93 (20.0)	
Obese (≥ 30.0 kg/m^2)	36 (7.6)	27 (5.5)	38 (8.6)	39 (8.4)	

Note. [1]Kruskal-Wallis test; [2]Chi-square test; There is a significant difference between a & b groups; & *p < 0.05

Table 5. The relationship between food consumption frequency, eating behaviors, and obesogenic environment

Frequency of food consumption	Uncontrolled eating	Cognitive restriction	Emotional eating	The obesogenic environment scale total score
Milk	r = -0.044 & p = 0.054	r = -0.003 & p = 0.900	r = -0.078 & **p = 0.001***	r = -0.048 & **p = 0.036***
Yogurt	r = 0.031 & p = 0.184	r = -0.073 & **p = 0.001***	r = 0.009 & p = 0.706	r = 0.019 & p = 0.416
Types of cheese	r = 0.105 & **p < 0.001***	r = -0.053 & **p = 0.020***	r = -0.067 & **p = 0.003***	r = 0.045 & p = 0.052
Kefir	r = 0.037 & p = 0.110	r = -0.069 & **p = 0.003***	r = 0.002 & p = 0.917	r = -0.060 & **p = 0.009***
Red meat	r = 0.052 & **p = 0.025***	r = 0.014 & p = 0.544	r = 0.043 & p = 0.060	r = 0.103 & **p < 0.001***
Chicken meat	r = 0.001 & p = 0.951	r = 0.051 & **p = 0.029***	r = 0.028 & p = 0.224	r = 0.077 & **p < 0.001***
Fish	r = 0.041 & p = 0.065	r = -0.043 & p = 0.062	r = 0.036 & p = 0.119	r = 0.015 & p = 0.612
Egg	r = 0.058 & **p = 0.012***	r = -0.054 & p = 0.051	r = 0.045 & p = 0.051	r = 0.058 & **p = 0.012***
Legumes	r = 0.009 & p = 0.707	r = 0.035 & p = 0.118	r = 0.011 & p = 0.645	r = 0.041 & p = 0.048
Oil seeds	r = 0.040 & p = 0.087	r = -0.022 & p = 0.333	r = 0.014 & p = 0.545	r = 0.123 & **p < 0.001***
Fruits	r = 0.104 & **p < 0.001***	r = -0.037 & p = 0.110	r = -0.074 & **p = 0.001***	r = 0.015 & p = 0.642
Vegetables	r = 0.074 & **p = 0.001***	r = -0.077 & **p = 0.001***	r = 0.018 & p = 0.446	r = 0.032 & p = 0.216
Types of bread	r = 0.130 & **p < 0.001***	r = 0.145 & **p < 0.001***	r = 0.051 & **p = 0.027***	r = 0.080 & **p = 0.001***
Rice	r = 0.023 & p = 0.318	r = 0.184 & **p < 0.001***	r = 0.039 & p = 0.088	r = 0.002 & p = 0.939
Bulgur	r = 0.004 & p = 0.856	r = 0.081 & **p < 0.001***	r = 0.010 & p = 0.654	r = 0.032 & p = 0.167
Pasta/noodles	r = 0.035 & p = 0.128	r = 0.203 & **p < 0.001***	r = 0.012 & p = 0.608	r = 0.018 & p = 0.433
Olive oil	r = 0.031 & p = 0.185	r = 0.028 & p = 0.226	r = 0.028 & p = 0.231	r = 0.034 & p = 0.062
Sunflower oil	r = 0.016 & p = 0.495	r = 0.129 & **p < 0.001***	r = 0.030 & p = 0.198	r = 0.062 & **p = 0.007***
Butter	r = 0.002 & p = 0.947	r = 0.090 & **p < 0.001***	r = 0.039 & p = 0.089	r = 0.043 & p = 0.063
Other liquid oils (corn, hazelnut, etc.)	r = 0.021 & p = 0.353	r = 0.041 & p = 0.078	r = 0.014 & p = 0.548	r = 0.045 & p = 0.052
Processed meat products	r = 0.082 & **p < 0.001***	r = 0.184 & **p < 0.001***	r = 0.027 & p = 0.245	r = 0.025 & p = 0.274
Fast food	r = 0.135 & **p < 0.001***	r = 0.155 & **p < 0.001***	r = 0.091 & **p < 0.001***	r = 0.130 & **p < 0.001***
Packaged foods	r = 0.184 & **p < 0.001***	r = 0.195 & **p < 0.001***	r = 0.114 & **p < 0.001***	r = 0.084 & **p < 0.001***
Sugary drinks	r = 0.138 & **p < 0.001***	r = 0.238 & **p < 0.001***	r = 0.069 & **p = 0.003***	r = 0.050 & **p = 0.031***

Note. Spearman correlation & *p < 0.05

Table 4 showed evaluation of demographic characteristics and obesity status according to quartile categories of the obesogenic environment scale total score. A difference was observed in age, gender, and BMI based on the quartiles of the obesogenic environment scale score (p < 0.05).

The relationship between food consumption frequency, eating behaviors and obesogenic environment were given in **Table 5**.

There was a positive correlation between uncontrolled eating score and the frequency of consumption of types of cheese, red meat, egg, fruits, vegetables, types of bread, processed meat products, fast food, packaged foods and sugary drinks; there was a negative correlation between cognitive restriction score and the frequency of consumption of yogurt, types of cheese, kefir and vegetables; there was a positive correlation between cognitive restriction score and the frequency of consumption of chicken meat, types of bread, rice, bulgur, pasta/noodles, sunflower oil, butter, processed meat products, fast food, packaged foods and sugary drinks; there was a negative correlation between emotional eating score and the frequency of consumption of milk, types of cheese and fruits; there was a positive correlation between emotional eating score and the frequency of consumption of types of bread, fast food, packaged foods and sugary drinks; there was a positive correlation between the obesogenic environment scale total score and the frequency of consumption of red meat, chicken meat, egg, oilseeds, types of

bread, sunflower oil, fast food, packaged foods and sugary drinks; there was a negative correlation between the obesogenic environment scale total score and the frequency of consumption of milk and kefir ($p < 0.05$).

DISCUSSION

A large body of evidence suggests that in a generally obesogenic environment; It shows that delicious, energy-dense foods are available and easily accessible. Living in an obesogenic environment can sometimes be challenging in terms of making the right decisions about eating choices and behaviors [2]. Considering this situation, this study aimed to investigate the effect of the obesogenic environment on eating behaviors in adult individuals.

In this study, it was determined that gender was effective on cognitive restriction and emotional eating. This finding is consistent with previous studies reporting that women have higher levels of emotional eating and cognitive disinhibition compared to men [13-18]. The gender difference in the emotional eating subscale can be explained by the fact that women are more sensitive to negative emotions than men and are more likely to eat in response to them, gonadal hormone levels and hormonal fluctuations experienced during the menstrual cycle [19-21].

In this study, while there was a statistically significant negative correlation between uncontrolled eating and emotional eating and age, a positive significant correlation was found between cognitive restriction and age. In another study conducted parallel with this study data, significant decreases in emotional eating scores were observed with age [22]. The reason for this may be that with increasing age, having a wider variety of emotion regulation strategies in negative situations can prevent emotional and uncontrolled eating [23]. As we get older, lower levels of anorectic hormones and perceptions of hunger ensure that sensitivity to hunger decreases with age [24].

It is observed that as weight gain increases, obese individuals experience low social support, are exposed to weight discrimination, and their eating behaviors change and emotional eating increases [7]. In this study, a positive and significant relationship was found between all eating behaviors and body weight and BMI. Consistent with these study findings, studies have reported more emotional eating and more uncontrolled eating in individuals with obesity [7, 9, 25-27]. Additionally, in other studies, as BMI increased, emotional eating scores and cognitive restriction scores were significantly higher than normal weight individuals [14, 22]. The reason for this may be that individuals who are constantly restrictive in their food intake may show overeating behavior after a while, and this may subsequently cause weight gain [14].

Individuals have personal responsibility for their health. However, environmental factors, including the obesogenic environment, affect people's ability to fulfill their personal responsibilities by exploiting biological, psychological, social and economic weaknesses by serving large amounts of unhealthy food to weaken individuals' health, causing individuals to gain unhealthy weight in the process [1, 28]. In this study, differences were observed in BMI according to obesogenic environmental scale score quartiles. In a meta-analysis study including 58 studies, it was observed that, in parallel with this study, BMI decreased significantly as the distance from the obesogenic environment increased [29] In another study, it was observed that an obesogenic environment would prevent weight loss [28].

In this study, it was determined that as uncontrolled eating and emotional eating scores increased, individuals' access to unhealthy foods increased and healthy food consumption decreased. Other studies conducted in parallel with the study data have also determined that individuals choose energy-dense and unhealthy foods during emotional eating periods [4, 5, 10, 30, 31]. Additionally, another study found a positive relationship between uncontrolled eating and carbohydrate cravings [22]. The reason for this situation is that in uncontrolled eating, individuals tend to consume excessive amounts of unhealthy foods, and individuals cannot control their food intake and tend to overeat due to the subjective feeling of hunger. Additionally, uncontrolled eating is associated with food cravings that contribute to binge eating episodes [7].

An obesogenic environment is one that promotes obesity. Today, the availability of foods high in fat, sugar and salt has increased, while the availability of lower-fat and healthier foods has decreased. The frequent availability of unhealthy foods and constant cues are provided through advertising to remind us of delicious, energy-dense foods. In an obesogenic environment, the introduction and availability of healthy alternatives occurs much less frequently than foods high in saturated fat, sodium, sugar and energy (i.e., junk food) [7]. In this study, it was observed that as the obesogenic environment score increased, the tendency towards unhealthy foods increased and the consumption of healthy food decreased significantly. In a comprehensive systematic review examining the effect of the obesogenic environment on food intake, consistent with the data of this study, less vegetable and fruit consumption, high snack intake, missed meals and unhealthy eating behavior were reported in individuals with an obesogenic environment and individuals mostly preferred foods containing high fat and carbohydrates [3]. Other studies support these results and have shown that an obesogenic environment increases unhealthy food intake and weight gain in individuals [2].

In this study, there is a positive and significant relationship between all eating behaviors and the obesogenic environment scale subscale scores (excluding cultural determinants and access to experience) and the obesogenic environment scale total score. In other studies, conducted in parallel with the results of this study, eating behaviors are negatively affected by the increase in the obesogenic environment [2, 3, 28, 29].

A key strength of this study is its comprehensive investigation of the interplay between obesogenic environment, eating behaviors and food consumption. In addition, the high sample size strengthens the statistically significant results of the study. However, certain limitations should be considered. First, cross-sectional design limits our ability to draw cause and effect conclusions, for this reason longitudinal follow-up studies are needed. Second, anthropometric measures based on self-report of participants. This can produce unreliable results.

Future research can address these limitations by conducting longitudinal follow-up designs, cross-over clinical interventions, and more diverse populations to refine our understanding of how eating behaviors interact in changing obesogenic environments.

CONCLUSION

The obesogenic environment appears as an environment where energy-dense, palatable and unhealthy foods are available and easily accessible. Living in this environment makes it challenging for individuals to make the right decisions in their food choices and makes it easier for individuals to access unhealthy foods. When people are in an obesogenic environment, unhealthy eating behaviors increase, food intake control is impaired, and weight gain is observed in individuals. Creating social nutrition policies to raise individuals' awareness about healthy nutrition by health personnel, to monitor them and to remove them from the obesogenic environment will minimize the negative impact of individuals from this process. This study covers these processes comprehensively and sheds light on future studies.

Author contributions: ÖMÇ: conceptualization, data curation, formal analysis, supervision, validation, writing–original draft, writing–review & editing & **MP & ZEM:** conceptualization, data curation, writing–original draft. All authors have agreed with the results and conclusions.

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Declaration of interest: No conflict of interest is declared by the authors.

Data sharing statement: Data supporting the findings and conclusions are available upon request from the corresponding author.

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